STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

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-0002526
Owner:	Bayer CropScience LP
Address:	800 North Lindbergh Boulevard, St. Louis, MO 63167
Continuing Authority:	Bayer CropScience LP
Address:	8400 Hawthorne Road, Kansas City, MO 64120
Facility Name:	Bayer CropScience LP
Facility Address:	8400 Hawthorne Road, Kansas City, MO 64120
Legal Description:	See following page, Jackson County
UTM Coordinates:	See following page
Receiving Stream:	See following page
First Classified Stream and ID:	See following page
USGS Basin & Sub-watershed No.:	See following page

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

FACILITY DESCRIPTION

Manufactures and formulates agricultural pesticides, herbicides, fungicides, and intermediate organic compounds. SIC # 2879 & 2819; NAICS # 325320. This facility does not require a certified wastewater operator.

See following page for further facility description.

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

July 1, 2018 November 1, 2019
Effective Date Modification Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2023
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (CONTINUED)

OUTFALL #001
Industrial - SIC #2879, #2819
Agricultural chemical manufacturing and formulation facility.
Outfall #001 discharges wastewater from the manufacture and formulation of pesticides, manufacture of inorganic compounds, production of intermediate chemicals, and environmental control equipment. The treatment system receives and treats contaminated groundwater from solid waste management units, and secondary containment water that is pumped to the treatment collection system. Cooling tower blowdown and non-routine discharges from the cooling towers are also directed to the treatment system. Heat is supplied to the facility by boiler steam; steam traps release excess condensate to the treatment system.

The treatment system consists of a wet well, pH adjustment, two primary clarifiers, surge tank, equalization tank, backup equalization tank, splitter tank, two pure-oxygen activated sludge bioreactors (three stages each), two secondary clarifiers, carbon absorption, emergency tank, and sludge handling centrifuges. This outfall discharges via submerged pipe to the Missouri River.

Legal Description:	NW ¼, NW ¼, Section 29, T50N, R32W, Jackson County
UTM Coordinates:	X = 372980, Y = 4332150 (discharge point)
	[X = 372630, Y = 4331290 (sampling point)]
Receiving Stream:	Missouri River (P)
First Classified Stream and ID:	Missouri River (P) WBID # 0356; 303(d)
USGS Basin & Sub-watershed No.:	Buckeye Creek – Missouri River (10300101 – 0301)
Design flow:	2.80 MGD
Average:	1.66 MGD

INTERNAL MONITORING OUTFALL #002
Discharge from the thermal oxidizer unit. Flow from outfall #002 goes to outfall #001. There are no regulations found which require this outfall be listed or sampled; outfall listed per permittee's request only.

UTM Coordinates:	X = 372509, Y = 4331397

OUTFALL #003
Stormwater overflow; stormwater only; this outfall is not permitted to discharge steam condensate (in other than trace amounts) or other process waters or wastewater.

Legal Description:	SW ¼, SW ¼, Section 29, T50N, R32W, Jackson County
UTM Coordinates:	X = 372555, Y = 4331126 (discharge point)
	[X = 372495, Y = 4331271 (sampling point)]
Receiving Stream:	Blue River (P)
First Classified Stream and ID:	Blue River (P) WBID # 0417; 303(d)
USGS Basin & Sub-watershed No.:	Outlet Blue River (10300101 – 0106)

OUTFALL #004
Stormwater overflow; stormwater only; this outfall is not permitted to discharge steam condensate (in other than trace amounts) or other process waters or wastewater.

Legal Description:	SW ¼, SW ¼, Section 29, T50N, R32W, Jackson County
UTM Coordinates:	X = 372555, Y = 4331126 (discharge point)
	[X = 372492, Y = 4331260 (sampling point)]
Receiving Stream:	Blue River (P)
First Classified Stream and ID:	Blue River (P) WBID # 0417; 303(d)
USGS Basin & Sub-watershed No.:	Outlet Blue River (10300101 – 0106)

INTERNAL MONITORING OUTFALL #005
Discharge from the Fenton Oxidizing Plant. Flow from outfall #005 goes to outfall #001. There are no regulations found which require this outfall be listed or sampled; outfall listed per permittee's request only.

UTM Coordinates:	X = 372409, Y = 4331283

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001 *main outfall*	**TABLE A-1** **INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on **July 1, 2018** and remain in effect through **June 30, 2019**. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/week	24 hr. total
CONVENTIONAL						
E. coli (Note 3)	MPN/100 ml	*		*	once/week	grab
pH (Notes 1 & 2)	SU	6.0 to 9.0		6.0 to 9.0	continuous	continuous
pH (Note 2) – total excursion time	minutes	*		446 total	continuous	calculated
pH (Note 2) – individual excursion	minutes	60		*	continuous	calculated
ELG						
Biochemical Oxygen Demand $_5$	mg/L	*		*	once/week	composite ¥
Biochemical Oxygen Demand $_5$	lbs/day Ω	5,994		1,418	once/week	composite ¥
Chemical Oxygen Demand	mg/L	*		*	once/week	composite ¥
Chemical Oxygen Demand	lbs/day Ω	10,523		7,224	once/week	composite ¥
Total Organic Pesticide Chemicals	µg/L	*		*	once/week	composite ¥
Total Organic Pesticide Chemicals	lbs/day Ω	7.1		2.5	once/week	composite ¥
Total Suspended Solids	mg/L	*		*	once/week	composite ¥
Total Suspended Solids	lbs/day Ω	5,776		1,726	once/week	composite ¥
ELG § 455 TABLE 2						
Metribuzin (Note 5)	µg/L	*		*	once/week	composite ¥
Metribuzin (Note 5)	lbs/day Ω	6.7		3.5	once/week	composite ¥
ELG § 455 TABLE 4						
Trichloromethane {aka} Chloroform	µg/L	*		*	once/month	grab
Trichloromethane {aka} Chloroform	lbs/day Ω	97.9		48.6	once/month	grab
NUTRIENTS						
Ammonia as N	mg/L	*		*	once/month	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE AUGUST 28, 2018. 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 ¥
OTHER						
Chlorides	mg/L	*		*	once/quarter ◊	composite ¥
Sulfates	mg/L	*		*	once/quarter ◊	composite ¥
Chloride plus Sulfate	mg/L	*		*	once/quarter ◊	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE OCTOBER 28, 2018. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *main outfall*	**TABLE A-2** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **July 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
CONVENTIONAL						
E. coli (Note 3)	MPN/100 ml	1030		206	once/week	grab
pH (Notes 1 & 2)	SU	6.0 to 9.0		6.0 to 9.0	continuous	continuous
pH (Note 2) – total excursion time	minutes	*		446 total	continuous	calculated
pH (Note 2) – individual excursion	minutes	60		*	continuous	calculated
ELG						
Biochemical Oxygen Demand $_5$	mg/L	*		*	once/week	composite ¥
Biochemical Oxygen Demand $_5$	lbs/day Ω	6,643		1,561	once/week	composite ¥
Chemical Oxygen Demand	mg/L	*		*	once/week	composite ¥
Chemical Oxygen Demand	lbs/day Ω	11,650		8,000	once/week	composite ¥
Total Organic Pesticide Chemicals	µg/L	*		*	once/week	composite ¥
Total Organic Pesticide Chemicals	lbs/day Ω	7.9		2.6	once/week	composite ¥
Total Suspended Solids	mg/L	*		*	once/week	composite ¥
Total Suspended Solids	lbs/day Ω	6,322		1,887	once/week	composite ¥
ELG § 455 TABLE 2						
Metribuzin (Note 5)	µg/L	*		*	once/week	composite ¥
Metribuzin (Note 5)	lbs/day Ω	6.7		3.5	once/week	composite ¥
ELG § 455 TABLE 4						
Trichloromethane {aka} Chloroform	µg/L	*		*	once/month	grab
Trichloromethane {aka} Chloroform	lbs/day Ω	97.9		48.6	once/month	grab
NUTRIENTS						
Ammonia as N	mg/L	*		*	once/month	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE NEXT REPORT IS DUE OCTOBER 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 ¥
OTHER						
Chlorides	mg/L	*		*	once/quarter ◊	composite ¥
Sulfates	mg/L	*		*	once/quarter ◊	composite ¥
Chloride plus Sulfate	mg/L	*		*	once/quarter ◊	composite ¥
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE NEXT REPORT IS DUE OCTOBER 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *main outfall*	**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 **July 1, 2018** 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		MONTHLY AVERAGE	MEASURE FREQUENCY	SAMPLE TYPE
ELG § 455 TABLE 4						
1,1-Dichloroethylene	lbs/day Ω	0.58		0.37	once/year	grab
1,1,1-Trichloroethane	lbs/day Ω	1.25		0.49	once/year	grab
1,2-Dichloroethane	lbs/day Ω	4.89		1.58	once/year	grab
1,2-Dichloropropane	lbs/day Ω	5.33		3.55	once/year	grab
1,2-Dichlorobenzene	lbs/day Ω	3.78		1.79	once/year	composite ¥
1,2-trans-Dichloroethylene	lbs/day Ω	1.25		0.49	once/year	grab
1,3-Dichloropropene {aka} 1,3-Dichloropropylene	lbs/day Ω	1.02		0.67	once/year	grab
1,4-Dichlorobenzene	lbs/day Ω	0.65		0.35	once/year	composite ¥
2-Chlorophenol	lbs/day Ω	2.27		0.72	once/year	composite ¥
2,4-Dichlorophenol	lbs/day Ω	2.60		0.90	once/year	composite ¥
2,4-Dimethylphenol	lbs/day Ω	0.83		0.42	once/year	composite ¥
Benzene	lbs/day Ω	3.15		0.86	once/year	grab
Bromodichloromethane {aka} Dichlorobromomethane	lbs/day Ω	8.81		3.29	once/year	grab
Bromomethane {aka} Methyl Bromide	lbs/day Ω	8.81		3.29	once/year	grab
Chlorobenzene	lbs/day Ω	0.65		0.35	once/year	grab
Chloromethane {aka} Methyl Chloride	lbs/day Ω	4.41		1.99	once/year	grab
Cyanide (Total)	lbs/day Ω	14.84		5.10	once/year	grab
Dibromochloromethane {aka} Chlorodibromomethane	lbs/day Ω	18.41		4.54	once/year	grab
Dichloromethane {aka} Methylene Chloride	lbs/day Ω	2.06		0.93	once/year	grab
Ethylbenzene	lbs/day Ω	2.50		0.74	once/year	grab
Lead (Total)	lbs/day Ω	16.00		7.42	once/year	composite ¥
Naphthalene	lbs/day Ω	1.37		0.51	once/year	composite ¥
Phenol	lbs/day Ω	0.60		0.35	once/year	composite ¥
Tetrachloroethylene	lbs/day Ω	1.30		0.51	once/year	grab
Tetrachloromethane {aka} Carbon Tetrachloride	lbs/day Ω	0.88		0.42	once/year	grab
Toluene	lbs/day Ω	1.85		0.60	once/year	grab
Tribromomethane {aka} Bromoform	lbs/day Ω	4.97		1.23	once/year	grab

MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE NEXT REPORT IS DUE JANUARY 28, 2020.
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Facility will also report all parameters in µg/L. See following Table A-4.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *main outfall*	**TABLE A-4** **FINAL MONITORING AND REPORTING 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 **July 1, 2018** 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	UNIT	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM		MONTHLY AVERAGE	MEASURE FREQUENCY	SAMPLE TYPE
ELG § 455 TABLE 4						
1,1-Dichloroethylene	µg/L	*		*	once/year	grab
1,1,1-Trichloroethane	µg/L	*		*	once/year	grab
1,2-Dichloroethane	µg/L	*		*	once/year	grab
1,2-Dichloropropane	µg/L	*		*	once/year	grab
1,2-Dichlorobenzene	µg/L	*		*	once/year	composite ¥
1,2-trans-Dichloroethylene	µg/L	*		*	once/year	grab
1,3-Dichloropropene {aka} 1,3-Dichloropropylene	µg/L	*		*	once/year	grab
1,4-Dichlorobenzene	µg/L	*		*	once/year	composite ¥
2-Chlorophenol	µg/L	*		*	once/year	composite ¥
2,4-Dichlorophenol	µg/L	*		*	once/year	composite ¥
2,4-Dimethylphenol	µg/L	*		*	once/year	composite ¥
Benzene	µg/L	*		*	once/year	grab
Bromodichloromethane {aka} Dichlorobromomethane	µg/L	*		*	once/year	grab
Bromomethane {aka} Methyl Bromide	µg/L	*		*	once/year	grab
Chlorobenzene	µg/L	*		*	once/year	grab
Chloromethane {aka} Methyl Chloride	µg/L	*		*	once/year	grab
Cyanide (Total)	µg/L	*		*	once/year	grab
Dibromochloromethane {aka} Chlorodibromomethane	µg/L	*		*	once/year	grab
Dichloromethane {aka} Methylene Chloride	µg/L	*		*	once/year	grab
Ethylbenzene	µg/L	*		*	once/year	grab
Lead (Total)	µg/L	*		*	once/year	composite ¥
Naphthalene	µg/L	*		*	once/year	composite ¥
Phenol	µg/L	*		*	once/year	composite ¥
Tetrachloroethylene	µg/L	*		*	once/year	grab
Tetrachloromethane {aka} Carbon Tetrachloride	µg/L	*		*	once/year	grab
Toluene	µg/L	*		*	once/year	grab
Tribromomethane {aka} Bromoform	µg/L	*		*	once/year	grab
WHOLE EFFLUENT TOXICITY						
Chronic WET Testing (Note 4)	TU_c	*		-	once/year	composite ¥

MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE NEXT 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)

INTERNAL MONITORING OUTFALL #002 *thermal oxidizer*	**TABLE A-5** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **July 1, 2018** 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	grab
Chemical Oxygen Demand	lbs/day Ω	*		*	once/month	grab
pH (Note 1)	SU	*		*	once/month	grab
Total Suspended Solids	mg/L	*		*	once/month	grab
Total Suspended Solids	lbs/day Ω	*		*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE NEXT REPORT IS DUE OCTOBER 28, 2019.

OUTFALLS #003 & #004 *Stormwater Only*	**TABLE A-6** **FINAL DISCHARGE, BENCHMARKS, 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 **July 1, 2018** 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 BENCHMARKS		BENCH-MARKS	MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE		MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		-	unscheduled ϕ	24 hr. estimate
CONVENTIONAL						
Biochemical Oxygen Demand $_5$	mg/L	**		45	unscheduled ϕ	grab
Chemical Oxygen Demand	mg/L	**		90	unscheduled ϕ	grab
Oil & Grease	mg/L	**		10	unscheduled ϕ	grab
pH (Note 1)	SU	**		6.0 to 9.0	unscheduled ϕ	grab
Settleable Solids	mL/L/hr	**		2.5	unscheduled ϕ	grab
Total Suspended Solids	mg/L	**		100	unscheduled ϕ	grab

MONITORING REPORTS SHALL BE SUBMITTED BY THE 28TH DAY OF THE MONTH FOLLOWING MONITORING.

INTERNAL MONITORING OUTFALL #005 *Fenton Oxidizing Plant*	**TABLE A-7** **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 **July 1, 2018** 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	*		*	Note 6	24 hr. estimate
OTHER						
Bacteria, Total (Note 3)	#/100 mL	*		*	Note 6	grab

MONITORING REPORTS SHALL BE SUBMITTED BY THE 28TH DAY OF THE MONTH FOLLOWING MONITORING.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

* Monitoring requirement only.
** Monitoring requirement with associated benchmark.
¥ A 24-hour composite sample is composed of a minimum of 48 aliquots (subsamples) collected by proportional flow. All aliquots must be collected within a 24 hour period.
Ω The facility shall calculate pounds per day by using the concentration in parts per million (ppm) multiplied by 8.34 and multiplied by MGD. Any analyte reported in µg/L (ppb) shall be converted to mg/L (ppm) first.
ϕ Unscheduled benchmark monitoring for outfalls #003 and #004: The facility shall monitor when outfalls #003 and #004 are discharging; however, sampling daily upon discharge is not required as this is for the purpose of stormwater benchmark monitoring. The facility is not required to monitor (or to divert discharge to obtain a sample), however quarterly monitoring is recommended (if discharging) to evaluate BMPs. Reduced sampling frequency for stormwater is allowed per 40 CFR 122.44(i)(4).

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

Note 2 The facility shall continuously record the pH of the discharge at outfall #001. The facility will report to the department the total amount of time of excursions beyond the limitations of pH (any value below 6.0 or above 9.0) for each month to the nearest hundredth of an hour. The facility will report the longest duration of any single excursion in each calendar month and provide an average of the individual excursions in minutes. The facility may exceed pH limitations for up to 7.43 hours per month, but no more than 60 minutes in duration for one excursion. [40 CFR 401.17]

Note 3 Bacteria: The monthly average limit shall be calculated as a geometric mean for *E. coli* and total bacteria.
Outfall #001: Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31.
Outfall #005: Total bacteria shall be sampled as desired.

Note 4 WET testing: see special condition #D.4.

Note 5 Analysis for metribuzin shall occur if the facility has manufactured or formulated the pesticide within the preceding seven days. The facility will report "0" for µg/L if no analysis was required and "0" for lbs/day. Analytical results that are non-detects at or below detection limit shall not be included in the equation to convert concentration units to pounds per day; the facility will report the "<" and the detection limit in µg/L and "0" for pounds per day if the parameter was not detected. The facility shall retain the method detection limit indicated by the laboratory quantifying the detection limits; the facility shall use sufficiently sensitive methods as outlined in 10 CSR 20-7.015(9)(D)2 and 3, and 40 CFR 136.

Note 6 This outfall is not required for NPDES compliance purposes. The permitted feature will be registered in the eDMR system but as an unscheduled condition; the facility will report results "at-will".

◊ Quarterly sampling schedule:

QUARTER	MONTHS	ALL 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

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:

Within 1 year of the effective date of this permit, the permittee shall attain compliance with the final effluent limits at outfall #001, for *E. coli*.

C. STANDARD CONDITIONS

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

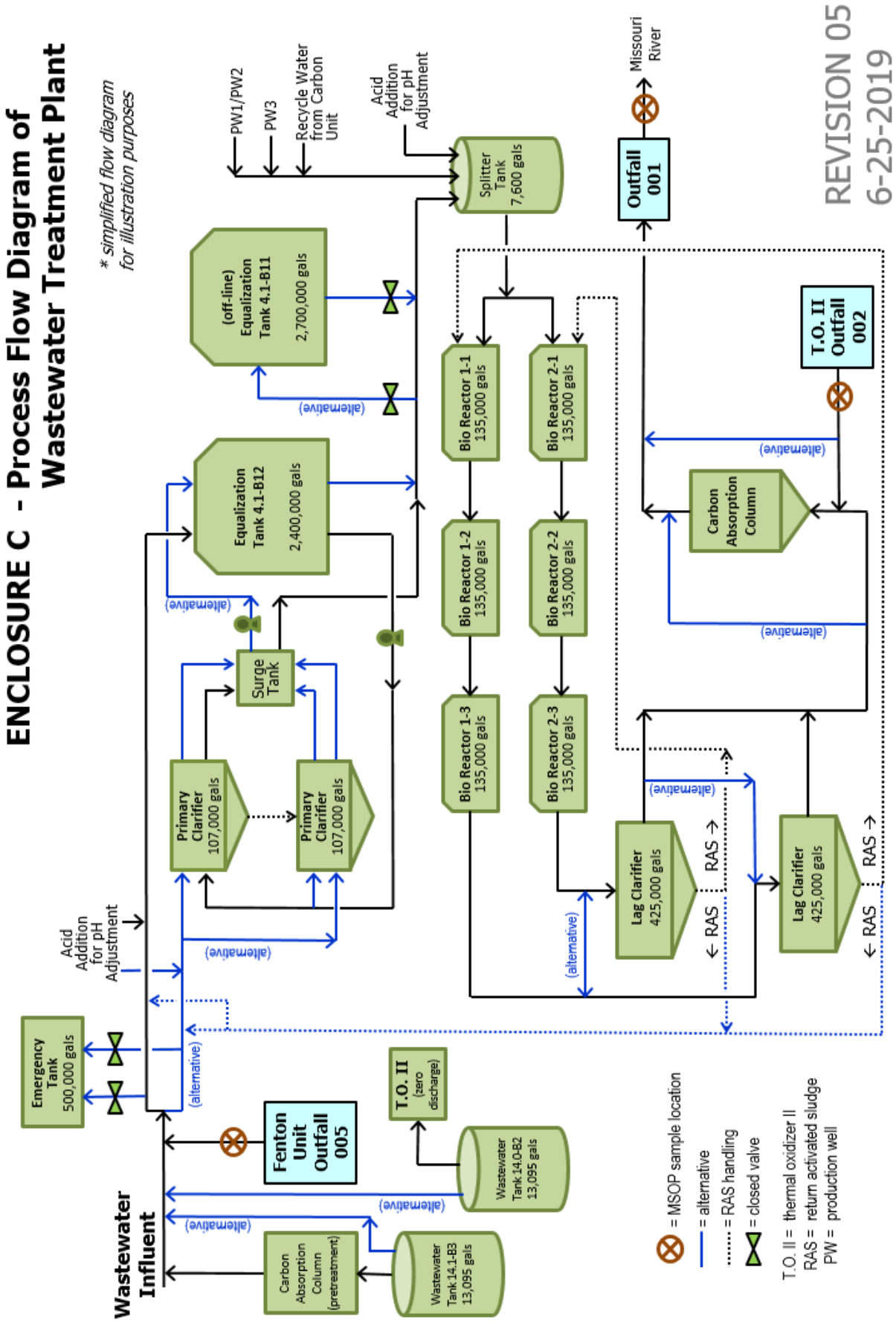
D. SPECIAL CONDITIONS

1. Total Organic Pesticide Chemicals
   (a) Pounds of Total Organic Pesticide Chemicals discharged shall be calculated by collecting a sample at outfall #001 and analyzing the sample for each pesticide that was manufactured and/or formulated at any time within seven (7) days before the sample was collected. Pesticides that are manufactured and/or formulated that have zero discharge requirements will not be analyzed or included in the total. The sampling results for each pesticide analyzed for shall be added together and converted from concentrations units to pounds using the 24 hour total flow (in MGD) for that sample.
   (b) Analytical results that are non-detects at or below detection limit shall not be included in the equation to convert concentrations units to pounds per day. The facility shall retain the method detection limit indicated by the laboratory quantifying the detection limits; the facility shall use sufficiently sensitive methods as outlined in 10 CSR 20-7.015(9)(D)2 and 3, and 40 CFR 136.
   (c) A permit modification to formulate a new pesticide will only be required when one or more of the following criteria are met:
      1. Formulation of a new pesticide would result in an increase by more than 20% in the formulation rate of pesticides.
      2. Stopping formulation of an existing pesticide would result in a decrease by more than 20% in the formulation rate of pesticides.
      3. Formulation of a new class of pesticides not similar to pesticides already formulated or manufactured by the facility.
      4. Formulation of a new pesticide would result in an increase in the design flow of the facility's wastewater treatment plant.
      5. Formulation of a new pesticide would result in the discharge of additional pollutants not permitted by the facility's Missouri State Operating Permit.

2. Headworks Exemption: This facility has notified the Department of possible de minimis losses under 40 CFR 261.3(a)(2)(iv)(D).
   (a) Hazardous wastes listed as F001, F002, F003, F004, F005, P014, P022, P024, P066, P069, P070, P127, P199, U002, U003, U006, U012, U019, U029, U031, U037, U041, U043, U045, U052, U056, U057, U070, U071, U072, U077, U079, U080, U081, U103, U112, U117, U122, U123, U129, U133, U140, U154, U159, U161, U169, U188, U189, U196, U210, U220, U221, U239, U240, U244, U279, U359, U404, U409, U410, and U411. are covered under this exemption.
   (b) The facility shall remove water that has accumulated in secondary containment areas by following the facility's Standard Operating Procedure (SOP) entitled "Sump Discharge."
   (c) Groundwater extracted by the facility's production wells must be treated by this facility's treatment system or by an alternative equivalent permitted treatment system prior to being discharged.
   (d) If groundwater or water from the secondary containment areas will cause or have reasons to believe it will cause an upset to this facility's treatment system or alternative permitted treatment system, the facility shall arrange for alternate proper treatment and disposal.
   (e) This permit does not authorize the discharge or disposal of sludges.

3. Bypasses [40 CFR 122.41(m)] are not authorized at this facility per 40 CFR 122.41(m)(4). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2.b. Bypasses are to be reported to the Kansas City Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system.

   Operation of the facility's wastewater treatment plant in accordance with alternative equipment usage and treatment order as indicated by the blue lines on the flow diagram is not considered a bypass. Blue lines indicate alternative treatment order and methods. The permittee must continue to operate the wastewater treatment plant in accordance with 40 CFR 122.41(e).


ENCLOSURE C - Process Flow Diagram of Wastewater Treatment Plant
* simplified flow diagram for illustration purposes
REVISION 05
6-25-2019
PW1/PW2
PW3
Recycle Water from Carbon Unit
Acid Addition for pH Adjustment
Missouri River
Splitter Tank 7,600 gals
Outfall 001
(off-line) Equalization Tank 4.1-B11 2,700,000 gals
Equalization Tank 4.1-B12 2,400,000 gals
Bio Reactor 1-1 135,000 gals
Bio Reactor 1-2 135,000 gals
Bio Reactor 1-3 135,000 gals
Bio Reactor 2-1 135,000 gals
Bio Reactor 2-2 135,000 gals
Bio Reactor 2-3 135,000 gals
T.O. II Outfall 002
Carbon Absorption Column
Surge Tank
Primary Clarifier 107,000 gals
Primary Clarifier 107,000 gals
Lag Clarifier 425,000 gals
Lag Clarifier 425,000 gals
RAS →
← RAS
(alternative)
Acid Addition for pH Adjustment
Emergency Tank 500,000 gals
(alternative)
Fenton Unit Outfall 005
T.O. II (zero discharge)
Wastewater Tank 14.0-B2 13,095 gals
Wastewater Influent
Carbon Absorption Column (pretreatment)
Wastewater Tank 14.1-B3 13,095 gals
= MSOP sample location
= alternative
= RAS handling
= closed valve
T.O. II = thermal oxidizer II
RAS = return activated sludge
PW = production well

D. SPECIAL CONDITIONS (CONTINUED)

4. Whole Effluent Toxicity (WET) tests shall be conducted as follows:
   (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013; Table IA, 40 CFR Part 136).* The permittee shall concurrently conduct a 7-day, static, renewal toxicity tests with the following species:
      - The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
      - The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).
   (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
   (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
   (d) The Allowable Effluent Concentration (AEC) is 0.19%
   (e) The dilution series is: 0.15%, 0.30%, 0.60%, 1.2%, and 2.4%
   (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 chronic toxicity testing. The report must include a quantification of chronic toxic units ($TU_c = 100/IC_{25}$) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration (IC_{25}) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.

5. 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 such a 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, See Special Condition #D.3. for 24-hr. bypass reporting requirements.
   (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.

6. The purpose of the Stormwater Pollution Prevention Plan (SWPPP) and the Best Management Practices (BMPs) listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP may cause it to be ineffective in preventing pollution [10 CSR 20-2.010(56)] of waters of the state, and corrective actions means the facility took steps to eliminate the deficiency.

D. SPECIAL CONDITIONS (CONTINUED)

7. The facility's SIC code(s) is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) hence shall implement a SWPPP which must be prepared and implemented upon permit issuance. The SWPPP must be kept on-site and should not be sent to the department unless specifically requested. The SWPPP must be reviewed and updated every five (5) years or as site conditions change (see Part III: Antidegradation Analysis and SWPPP sections in the fact sheet). The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in February 2009 (www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf). 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) The SWPPP must include a schedule for once per quarter site inspections and a provision for documenting inspection findings. The inspections must include observation and evaluation of BMP effectiveness. Deficiencies must be corrected within fourteen (14) days and the actions taken to correct the deficiencies shall be included with the written inspection records. For any deficiency that cannot be corrected in fourteen (14) days, the permittee is required to inform the department that a deficiency will take longer than fourteen (14) days to correct. The permittee will provide a projected timeline for correction of the deficiency, and will update the SWPPP with the corrective measures. Inspection reports must be kept on site with the SWPPP and maintained for a minimum period of three years. These must be made available to department or EPA personnel upon request.
   (c) A provision for designating an individual to be responsible for environmental matters.
   (d) A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of the department.

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

9. 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.
   (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 to comply with general water quality criteria, effluent limits, or benchmarks. This could include the use of straw bales, silt fences, or sediment basins, if needed.

D. SPECIAL CONDITIONS (CONTINUED)

10. Stormwater accumulated in secondary containment areas must be incorporated into the wastewater treatment system; release directly to waters of the state is prohibited.

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 shall 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.

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.

15. Reporting of Non-Detects
    (a) 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.
    (b) When performing biological test methods such as *E. coli*, BOD, and WET, the permittee shall not report a sample result as "Non-Detect" without also reporting the reporting limit of the test. This special condition supersedes above item D.15(a).
    (c) The permittee shall report the "Non-Detect" result using the less than sign and the method detection limit (e.g. <10). When reporting data using eDMR system, the permittee is to follow eDMR data entry format and reporting instructions.
    (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 daily discharge, monthly averages, or geometric means, one-half of the method 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).
    (g) This special condition does not supersede other special conditions regarding calculations or reporting requirements.

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
STATEMENT OF BASIS
MO-0002526
BAYER CROPSCIENCE LP

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.

Part I – Facility Information

Facility Type:	Agricultural chemical manufacturing and formulation facility
Facility SIC Code(s):	#2879 & #2819
Facility Description:	Manufactures and formulates agricultural pesticides, herbicides, fungicides, and intermediate organic compounds. SIC # 2879 & 2819; NAICS # 325320. This facility does not require a certified wastewater operator.

Part II – Modification Rationale

This operating permit is hereby modified to reflect the facility's full-scale manufacture of the fungicide Fluopyram.
The addition of Fluopyram manufacturing increases the net amount of pesticides manufactured by the facility and increases the amount of wastewater generated. On May 6, 2019, the Department issued a Water Quality and Antidegradation Review Preliminary Determination for the proposed discharge. Based on the Missouri Department of Natural Resources initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the Antidegradation Implementation Procedure (AIP). The complete Water Quality and Antidegradation Review can be found in Appendix – Antidegradation Analysis.

To reflect the changes associated with the full-scale manufacture of Fluopyram, the long-term pesticide manufacturing rate used to derive technology-based effluent limits was increased from the previous rate of 491,050 lbs/day by an additional 85,435 lbs/day to a new production rate of 576,485 lbs/day. The wastewater generated through intermediate production was increased from the previous rate of 768,377 gallons/day by an additional 16,800 gallons/day to a new production rate of 785,177 gallons/day. The facility's design flow remains 2.80 MGD. Using the updated production data, new ELG permit limits were calculated for Biochemical Oxygen Demand$_5$ (BOD_5), Chemical Oxygen Demand (COD), Total Organic Pesticide Chemicals, and Total Suspended Solids (TSS). The new effluents limits are found in Table A-2, Final Effluent Limitations and Monitoring requirements because the schedule in Table A-1 has passed.

The Special Condition pertaining to Total Organic Pesticide Chemicals was updated to include the criteria that would trigger the need for a permit modification to formulate a new pesticide or cease the formulation of an existing pesticide. Additionally, the "Process Flow Diagram of Wastewater Treatment Plant" was updated to include two existing wastewater tanks associated with the facility's treatment plant.

The permittee noted the following typographical errors occurred:

- Table A-3, incorrect monitoring report due date, changed to correct date of January 28, 2019.
- Fact Sheet, outfall #001, ELG Requirements, Biochemical Oxygen Demand, BPT citation incorrect, changed to correct citation of 455.22.
- Fact Sheet, outfall #001, ELG Requirements, Total Suspended Solids, BPT citation incorrect, changed to correct citation of 455.22.

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

✓ Applicable; new, altered, or expanded process water discharge, please see APPENDIX – ANTIDEGRADATION ANALYSIS.

Part III – Effluent Limits Determination

TABLE #001: EFFLUENT LIMITATIONS TABLE (REVISED)

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
ELG							
BIOCHEMICAL OXYGEN DEMAND$_5$	lbs/day	6,643	1,561	5,994/1,418	ONCE/WEEK	ONCE/MONTH	COMP.
CHEMICAL OXYGEN DEMAND	lbs/day	11,650	8,000	10,523/7,224	ONCE/WEEK	ONCE/MONTH	COMP.
TOTAL ORGANIC PESTICIDE CHEMICALS	lbs/day	7.9	2.6	7.1/2.5	ONCE/WEEK	ONCE/MONTH	COMP.
TOTAL SUSPENDED SOLIDS	lbs/day	6,322	1,887	5,776/1,726	ONCE/WEEK	ONCE/MONTH	COMP.

Biochemical Oxygen Demand (BOD_5)

ELG SECTION	PERMITTEE'S VALUES	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures pesticides in lbs/day	576,485‡	7.4	1.6	pounds per 1000 pounds	4,265.99‡	922.38‡
BPT/BPJ 455.22 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.785177‡	120	45	8.34	785.81‡	294.68‡
SUM					**6,643‡**	**1,561‡**

‡ Updated value to reflect full-scale manufacture of Fluopyram; June 25, 2019.

Chemical Oxygen Demand (COD)

ELG SECTION	PERMITTEE'S VALUES	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	576,485‡	13	9	pounds per 1000 pounds	7,494.31‡	5,188.37‡
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.785177‡	120	45	8.34	785.81‡	294.68‡
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %ile daily max; x2.1 monthly average	236.58	496.81
SUM					**11,650‡**	**8,000‡**

‡ Updated value to reflect full-scale manufacture of Fluopyram; June 25, 2019.

Total Organic Pesticide Chemicals

Total Organic Pesticide Chemicals	Permittee's Value	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/day	Monthly Average in lbs/day
BPT 455.20 manufacture in lbs/day	576,485‡	0.01	0.0018	0.001	5.7649‡	1.03767‡
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.9‡**	**2.6‡**

‡ Updated value to reflect full-scale manufacture of Fluopyram; June 25, 2019.

Total Suspended Solids (TSS)

ELG Section	Permittee's Values	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/day	Monthly Average in lbs/day
BPT 455.22 pesticide manufacture in lbs/day	576,485‡	6.1	1.8	pounds per 1000 pounds	3,516.56‡	1,037.67‡
BPT/BPJ 455.22 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.785177‡	183	57	8.34	1,198.35‡	373.26‡
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**6,322‡**	**1,887‡**

‡ Updated value to reflect full-scale manufacture of Fluopyram; June 25, 2019.

Part IV – 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.

PUBLIC NOTICE:
The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing. The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit. For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- ✓ The Public Notice period for this operating permit was from August 30, 2019, to September 30, 2019. No comments were received.

DATE OF FACT SHEET: JULY 30, 2019

COMPLETED BY:

ELLEN MODGLIN
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
ENGINEERING SECTION
(573) 751-7466
Ellen.Modglin@dnr.mo.gov

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATEMENT OF BASIS
MO-0002526
BAYER CROPSCIENCE LP

This Statement of Basis (Statement) gives pertinent information regarding minor modification(s) to the above listed operating permit without the need for a public comment process. A Statement is not an enforceable part of a Missouri State Operating Permit.

Part I – Facility Information

Facility Type:	Major Categorical Industrial
Facility SIC Code(s):	2879 (Pesticides and Agricultural Chemicals) and 2819 (Industrial Inorganic Chemicals)
Facility Description:	The facility manufactures and formulates agricultural crop protection products, such as: herbicides, insecticides, fungicides, and seed treatments.

Part II – Modification Rationale

This operating permit is hereby modified to reflect a change in the owner's address and phone number.

No other changes were made at this time.

Part III – Administrative Requirements

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

DATE OF FACT SHEET: 10/17/18

COMPLETED BY:

GORDEN WRAY, ENVIRONMENTAL SPECIALIST II
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
(573) 751-1398
Gorden.wray@dnr.mo.gov

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0002526
BAYER CROPSCIENCE LP

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

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

Part I. FACILITY INFORMATION

Facility Type:	Major Categorical Industrial
Facility SIC Code(s):	2879 (Pesticides and Agricultural Chemicals) and 2819 (Industrial Inorganic Chemicals)
Facility NAICS Code:	325320 (Pesticide and Other Agricultural Chemical Manufacturing)
Application Date:	08/11/2016 revised: 12/09/2016 revised: 07/07/2017 revised: 07/14/2017
Expiration Date:	02/06/2017
Last Inspection:	none found

FACILITY DESCRIPTION:
The facility manufactures and formulates agricultural crop protection products, such as: herbicides, insecticides, fungicides, and seed treatments under Standard Industrial Codes (SIC) 2879 and 2819 and North American Industry Classification System (NAICS) code of 325320. The site consists of three manufacturing plants, three formulation plants, eight laboratories, a safety building, emergency response equipment, an administration building, a process wastewater treatment plant (WWTP), a Resource Conservation and Recovery Acts (RCRA) permitted hazardous waste incinerator, and multiple warehouse and maintenance buildings. In addition, there are seven tank farms located onsite associated with the manufacturing and formulation processes. There are three railcar unloading points at the facility. The facility operates 24 hours per day, 7 days per week, and 365 days per year.

Facility wastewater is discharged from outfall #001 to the Missouri River via a submerged pipe, which has a design flow of 2.8 million gallons per day (MGD). Both process and sanitary wastewater are treated by pure oxygen activated sludge with equalization, pH adjustment, and other treatment technologies before being discharged through outfall #001. A diffuser has been installed at the end of outfall #001's discharge pipe in the Missouri River to encourage greater mixing. Process wastewater may also be treated by incineration before being discharged through outfall #001.

Outfall #002 is an internal monitoring location that receives wastewater from the thermal oxidizer, treats the wastewater, and then discharges to the facility's wastewater treatment plant where it mixes with partially-treated process wastewater, may undergo additional treatment, and ultimately is monitored and discharged via outfall #001.

The facility uses a first flush system where the stormwater from the beginning of precipitation (and in many cases all precipitation from) events is sent to the wastewater treatment facility and discharged through outfall #001. Outfall #003 and outfall #004 are stormwater outfalls and only discharge when significant rainfall events overload the stormwater collection system's hydraulic capacity.

Outfall #005 is the new Fenton Oxidizing Plant. It was put into service in midyear 2016 to point source treat wastewater generated from the formulation of chemical and biological pesticides with the purpose of treating (i.e., removing) pesticides. The treated effluent from the Fenton Oxidizing Plant is discharged via internal outfall #005 to the overhead process sewer where the effluent mixes with other plant wastewater before entering the headworks of the facility's site-wide wastewater treatment plant. The Fenton Oxidizing Plant is run in batch mode and will often temporarily store treated wastewater prior to discharging it to the process sewer. While storing treated wastewater the Fenton Oxidizing Plant can often go 1 to 3 days with no discharge occurring (i.e., zero discharge) through outfall #005. The Fenton Oxidizing Plant will also not produce a discharge when there is no formulation wastewater to treat.

The facility's wastewater treatment plant consists of a wet well, pH adjustment, two primary clarifiers, a surge tank, an equalization tank, a backup equalization tank, a splitter tank, two pure-oxygen activated sludge biological reactors comprised of three stages each, two secondary clarifiers, a carbon adsorption system, an emergency tank, and various sludge handling equipment including centrifuges. The wastewater treatment plant has a design treatment capacity of 2.8 million gallons per day (MGD) and was put in service in the late 1970's.

The facility requested internal monitoring outfalls be included in the permit. The permit writer has determined neither of these outfalls (#002 or #005) are subject to either effluent limitation guidelines or water quality limitations. However, the facility has requested limitations on outfall #005 (since removed) and to report monitoring of outfall #002. The permit writer has included outfalls #002 and #005 at the request of the permittee as the department does not require the information.

PROCESS WATER OUTFALL TABLE:

OUTFALL	AVERAGE FLOW	DESIGN (MAXIMUM) FLOW	TREATMENT LEVEL	EFFLUENT TYPE
#001	1.31 MGD 1.66 MGD ǂ	2.80 MGD 4.33 CFS	δ advanced treatment system	process wastewater ∞, and overflow stormwater beyond treatment capacity
#002	0.244 MGD	0.40 MGD	see outfall #001	Thermal Oxidizer II (internal monitoring point not required by ELG)
#005	0.011 MGD	0.032 MGD	see outfall #001	Fenton Oxidizing Plant (chemical and biological pesticides) (internal monitoring point not required by ELG)

δ the advanced treatment system consists of filtration, mixing, neutralization, flocculation, primary clarification, activated sludge, secondary clarification, carbon absorption, chemical conditioning, hydrolysis, centrifugation, gravity thickening, incineration, landfilling, discharge to surface water but may not necessarily occur in listed order as the treatment train changes with source effluent being treated

∞ the process wastewater consists of: herbicide production, intermediate production, pesticide formulation, laboratory, sanitary wastewater, maintenance wastewater, warehouse, container cleaning, utilities, administration, cafeteria, formulation wash water, groundwater, cooling tower wastes, and first flush (20 to 30 minutes) stormwater

ǂ calculated based on DMRs

STORMWATER OUTFALLS TABLE:

OUTFALL	AVERAGE FLOW	DESIGN FLOW	TREATMENT LEVEL	EFFLUENT TYPE
#003	variable	variable	BMPs	stormwater Ξ
#004	variable	variable	BMPs	stormwater Ξ

Ξ During heavy rain events, electric pumps in the stormwater collection sump reach maximum hydraulic capability at which time excess stormwater will be diverted through a gate valve to outfalls #003 and #004; all stormwater from smaller events and first flush of large events is or captured and treated then discharged through outfall #001. If stormwater volumes are particularly significant, this permit allows discharge from outfall #001 or outfalls #003 or #004 untreated. At the time the stormwater is being discharged untreated, the initial, most impure stormwater has already been routed to the treatment system. The stormwater discharged untreated has been deemed second flush therefore is not carrying a significant pollutant load.

FACILITY PERFORMANCE HISTORY & COMMENTS:
The electronic discharge monitoring reports were reviewed for the last five years. Data was downloaded from the MoCWIS system on 5/16/2017 which encompassed data from monitoring periods beginning 1/1/2012 through 4/31/2017.

Exceedances for outfall #001 are supplied below in alphabetical order. Concentration based parameters did not have permit limits.

Monitoring Period	***Parameter Description***	***Daily Maximum Reported –no limit***	***Monthly Average Reported – no limit***	***Daily Maximum Limit***	***Daily Maximum Reported***	***Monthly Average Limit***	***Monthly Average Reported***
07/31/2015	COD	1294 mg/L	968 mg/L	18850 lbs/day	21124 lbs/day	12653 lbs/day	13074 lbs/day
11/30/2013	COD	1676 mg/L	717 mg/L	18850 lbs/day	22784 lbs/day	12653 lbs/day	8646 lbs/day
08/31/2016	Total Pesticides	0.87 mg/L	0.18 mg/L	10.78 lbs/day	12.26 lbs/day	4.69 lbs/day	2.61 lbs/day
05/31/2016	Total Pesticides	4.05 mg/L	0.82 mg/L	10.78 lbs/day	64.2 lbs/day	4.69 lbs/day	12.43 lbs/day
5/31/2017	TSS	1,842 mg/L	311 mg/L	7,957 lbs/day	11721 lbs/day	2355 lbs/day	1992 lbs/day

The DMRs were reviewed and only the above five exceedances were noted. Most limitations in this permit are technology based limitations as water quality parameters do not show reasonable potential to cause or contribute to in-stream excursions due to the large mixing zones afforded by the multi-port diffuser.

In a letter dated November 14, 2017, the permittee reported an excursion of effluent limits to the department. The excursion occurred on November 7, 2017 and exceeded total organic pesticide chemicals of 14.36 pounds per day. The parameters detected were clothianidin, fluopyram, Sencor (a product containing metribuzin), and tebuconazole totaled at 1.52 ppm (mg/L). Subsequent sampling on November 11, 2017 showed the facility is no longer discharging total organic pesticides above effluent limitations.

A construction permit, No. CP0001287, was issued to the facility on July 20, 2012 to install a multi-port effluent diffuser. Design parameters for the submerged multi-port effluent diffuser are as follows:

Diffuser Length (meters)	20
Bank to Diffuser Head (meters)	10.5
Number of Openings	16
Number of Risers	16
Ports per Riser	1
Spacing between Riser/Opening (meters)	1.33
Nozzle Arrangement	unidirectional with fanning
Diffuser Alignment Angle	90 deg
Vertical Discharge Angle	25 deg
Horizontal Discharge Angle	0 deg
Relative Orientation Angle	90 deg

The above submerged multi-port effluent diffuser was added to the discharge pipe for the Bayer CropScience Facility. Kansas City Regional Office originally reviewed the proposed effluent diffuser for the Bayer CropScience in July 2009. The Department issued construction permit 21-8813 in July 2009 for the project. One year time extension was granted in 2010 and the construction permit number was changed to CP0000791. CP0000791 expired prior to construction of the effluent diffuser in the Missouri River. Bayer CropScience submitted a new construction permit application on May 9, 2012.

A United States Army Corps of Engineers (USACE) Section 404/Section 10 permit was also granted to conduct work in-stream.

The facility submitted a CORMIX2 model to the department which was used by the EPA in calculation of the previous permit's limits for whole effluent toxicity. Expanded zones of initial dilution are allowed per 10 CSR 20-7.031(5)(A)4.B.(III)(b). However, the rule does not specifically allow an expanded mixing zone. Regardless, the CORMIX2 model actually identified a smaller mixing zone than what is allowed in rule therefore the smaller mixing zone will be used to complete calculations throughout this permit. One flaw with the model is that it only modeled based on the 7Q10. Certain calculations in this permit (HHF) are based on the 1Q10 and 30Q10 flows which the model did not capture. Equations using the 1Q10 and 30Q10 flows will be based on a direct discharge to the Missouri River without a diffuser. The ZID is 446:1, the MZ is 535:1 dilutions at the edge of the allowed mixing areas.

The facility indicated they were not subject to 40 CFR 414 as was applied in the previous permit. The permit writer reviewed the ELG and determined this ELG does not imply or confer applicability as the SIC code is not listed. Monitoring for pollutants listed in 414 is removed.

FORMULATED AND MANUFACTURED CHEMICALS:
The facility formulates (blending or mixing of chemicals) and manufactures (creates a new chemical via a chemical reaction) pesticides. The list of Pesticide Active Ingredients (PAIs) manufactured & formulated at the facility are found under the ELG-Effluent Limitation Guideline section in Part III. This list is not exhaustive but contains most of the chemicals manufactured and formulated at this facility. The facility does not manufacture all at once but uses a "just-in-time" approach and produces based on actual and expected seasonal demand.

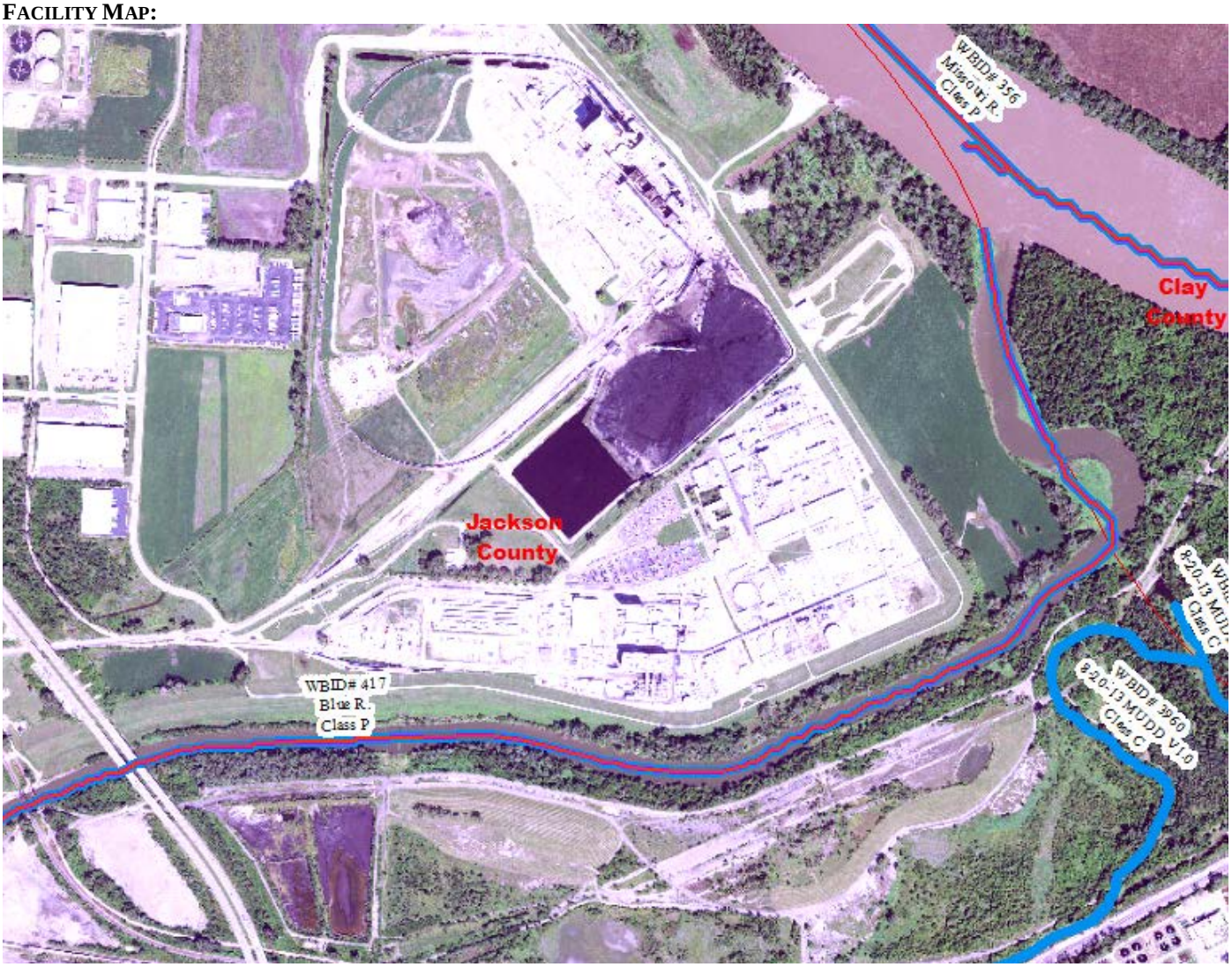
TECHNOLOGY BASED LIMITATIONS:
The permittee is subject to several effluent limitation guidelines (ELG), through direct applicability and by the use of best professional judgment. See Part III; ELG for additional information.

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 falls under the definition of major water user but is not yet registered with the Department. The facility must register with the Department. Registration can be completed at this website: https://dnr.mo.gov/MWU/

WATER USE SOURCES:
Potable water from the City of Kansas City is used in plant processes at about 1.575 MGD, and is also used for cooling tower make-up water. Groundwater is also used (see above).

FACILITY MAP:



WATER BALANCE DIAGRAM:
This facility operates a modern wastewater treatment plant which includes primary, secondary, and tertiary treatment processes. The primary step is clarification, equalization, and pH adjustment. The secondary step consists of six pure-oxygen activated sludge biological reactors. The biological reactors are arranged in two groups called "trains"; each train consists of three biological reactors operated sequentially. The north and south trains are operated in parallel. The tertiary steps include clarification and carbon absorption.

The process flow diagram in the permit shows the location of existing internal outfall #002, and proposed new internal outfall #005, relative to the wastewater treatment plant's equipment layout and outfall #001 and are indicated by a circle with a X inside (e.g., ⊗). Additional information on proposed outfall #005, for the discharge from the new Fenton Oxidizing Plant. The flow diagram also visually depicts the wastewater treatment plant's equipment layout and the various alternative ways that the facility operates the equipment. This includes which equipment is operated, options to idle certain equipment, and in what order to operate the equipment relative to the other equipment.

Blue lines on the diagram indicate alternative flows for various production treatments. The facility has indicated the blue lines allow the wastewater to bypass certain steps within the treatment train which are not required for certain wastewaters. This type of bypass is not subject to bypass reporting as specified in the special condition #D.3. The permittee must still maintain compliance with all effluent limitations regardless of the order of treatment being incorporated at the wastewater facility.

STEAM BOILERS AND VENT GAS INCINERATOR:
Facility steam boilers and the vent gas incinerator information and data are provided for the purpose of supporting the Outfall #001 facility description.

The facility uses steam to heat buildings, heat-trace piping to prevent freezing, generate hot water, and process heating uses. Steam is generated by two identical water-tube steam boilers that operate in tandem. The two boilers are rated at a full load combined capacity of 160,000 pounds (lbs) steam flow per hour (e.g., 80,000 lbs steam/hour/each). The facility also generates a small amount of steam from a waste heat recovery boiler on the Vent Gas Incinerator (VGI) air pollution control devise. The maximum amount of steam the VGI can produce is 22,000 lbs steam/hour, although it normally operates around 12,000 lbs steam/hour. The total combined maximum steam generation rate at the facility is 182,000 lbs steam/hour. Operating at this maximum load capacity would consume approximately 21,800 gallons/hour of feed water, which equates to 523,200 gallons/day. None of the steam generated is used to generate electricity. The VGI operates on natural gas and the steam boilers are designed to run on natural gas or No. 2 fuel oil.

The source of feed water to the boilers and VGI is City water. Prior to use, the feed water is softened to minimize scaling, and de-aerated to minimize corrosion, of the steam generating equipment. The feed water to the boilers also passes through a heat exchanger and economizer to preheat the feed water before it enters the boiler. A simplified diagram of a boiler is presented below in Figure 1.

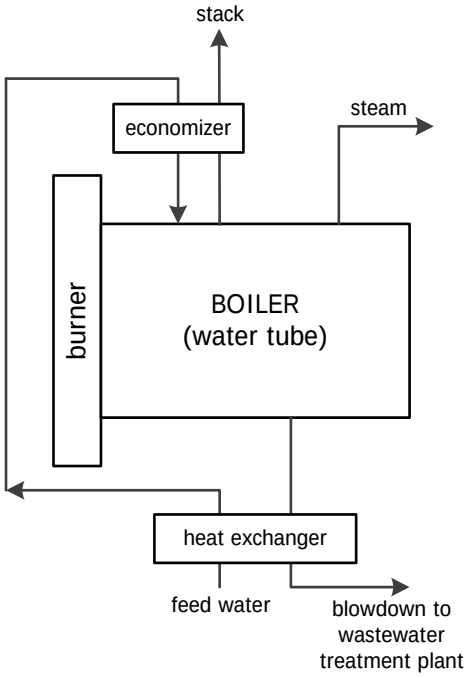


Figure 1 - Steam Boiler

Under maximum full steam loading the maximum daily discharge of wastewater blowdown from the steam boilers and VGI is estimated to be 39,700 gallons/day. The average temperature of the blowdown over the last three years is 81.6 °F.

The steam boilers and VGI's blowdown is discharged to the Wet Well of the site-wide wastewater treatment plant, where it mixes with process wastewater and undergoes treatment in the wastewater treatment plant. The effluent from the wastewater treatment plant is monitored and discharged via Outfall #001 through a submerged multi-port diffuser in the Missouri River.

COOLING TOWERS:
Facility cooling towers information and data are provided for the purpose of supporting the outfall #001 facility description.

The facility has four induced draft counter-flow cooling towers. The cooling towers provide cold water to chillers, air compressors, and process cooling equipment such as vent condensers and reactor jackets. Once used the hot water is returned to the top of the cooling towers to repeat the cycle. A simplified diagram of a two cell cooling tower is shown below in Figure 2.

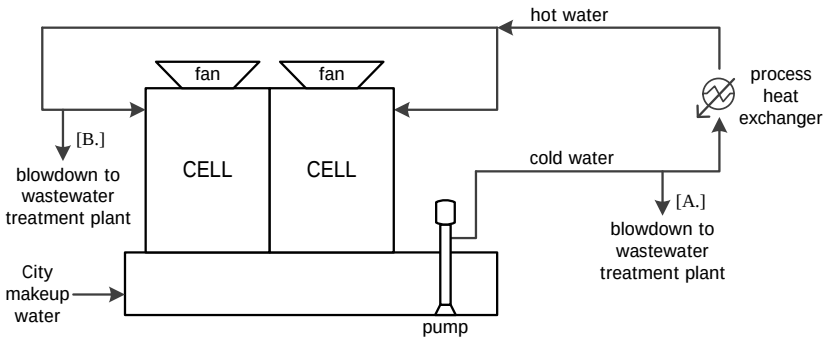


Figure 2 - Cooling Tower

There are no flow meters on the wastewater blowdown lines from the cooling towers. Therefore, to generate the flow data presented in this write-up, other known values, assistance from Bayer's utility vendor, and common industry calculations were used. Also, the flow data was generated from a time period when the cooling towers are under the highest demand loading which is during summer months. Specifically, the flow and temperature data were generated using data from the summer months of June 2017 through August 2017. It is during times of maximum loading that the cooling towers generate the highest blowdown flow rates at the warmest temperatures.

The source of makeup water to the cooling towers is City water. The water in the cooling towers is chemically treated to maximize energy efficiency and equipment life by minimizing problems due to corrosion, scale, deposition, and biological growth. Blowdown from the cooling towers is required to maintain cooling tower's basin's water level, dissolved solids level, suspended solids level, and water clarity. This is necessary to maintain a clean cooling system for efficient operation.

Under maximum loading the daily discharge of wastewater blowdown from all four cooling towers is estimated to be 93,300 gallons/day. The blowdown from three of the cooling towers is taken from the cold water discharge line of the cooling towers. See location [A.] in Figure 2. Under maximum loading the estimated flow and temperature from these three cooling towers is 67,400 gallons/day and 77.6 °F. The cooling tower that discharges blowdown from the return line, location [B.], has a maximum loading discharge of 25,900 gallons/day at a temperature of 89.6 °F.

Blowdown from the cooling towers is conveyed to the site-wide wastewater treatment plant by either the storm sewer or overhead process sewer. Upon entering the wastewater treatment plant the blowdown water mixes with process wastewater and undergoes treatment in the wastewater treatment plant. The effluent from the wastewater treatment plant is monitored and discharged via outfall #001 through a submerged multi-port diffuser in the Missouri River.

Part II. Receiving Stream Information

Receiving Water Body's Water Quality:
The facility discharges process water to the Missouri River, and stormwater to the Blue River. Data for the Missouri and the Blue Rivers can be found at the USGS's website using the following link: https://waterdata.usgs.gov/mo/nwis/sw

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

- ✓ Applicable; the Missouri River is listed on the 2016 Missouri 303(d) list for *Escherichia coli* which impairs the WBC-B and SCR uses. This facility may be considered a source of the above listed pollutant or may contribute to the impairment on this river. Once a TMDL is developed, the permit may be reopened to address any limitations then provided.
- ✓ Applicable; the Blue River is listed on the 2016 Missouri 303(d) list for *Escherichia coli* which impairs the WBC-B and SCR uses. This facility is not considered a source of the above listed pollutant or considered to contribute to the impairment on this river.

Total Maximum Daily Load (TMDL):
A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected; 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/

- ✓ Outfall #001 discharges to the Missouri River which is associated with the 2006 EPA approved TMDL for chlordane and Polychlorinated Biphenyls (PCBs). http://dnr.mo.gov/env/wpp/tmdl/docs/0226-0356-0701-1604-missouri-r-tmdl.pdf
- ✓ Outfalls #003 and #004 discharge to the Blue River which is associated with the 2001 EPA approved TMDL for chlordane. http://dnr.mo.gov/env/wpp/tmdl/docs/0417-0418-0419-0421-blue-river-tmdl.pdf Chlordane was banned in 1988, so no more inputs into the Blue River will be occurring. The Missouri Department of Health has issued fish consumption advisories for the Blue River since 1985, but in the July, 2001 Fish Advisory, the Department of Health discontinued the warning on fatty fish due to the reduction of chlordane in fish tested from the Blue River. Further reductions in chlordane in fish are expected to continue. Since chlordane has been banned, there is no specific remediation plan for this impairment.
- ✓ Neither of these TMDLs implements limitations or indicates this facility was the cause of the impairments. Therefore, the Watershed Protection Section did not review this permit.

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 Streams Table:

Outfall	Waterbody Name	Class	WBID	Designated Uses*	Distance to Segment	12-digit HUC
#001	Missouri River	P	0356	DWS, HHP, IND, IRR, LWW, SCR, WBC-B, WWH (AQL)	0.0 mi	Buckeye Creek – Missouri River 10300101-0301
#003, #004	Blue River	P	0417	HHP, IND, IRR, LWW, SCR, WBC-B, WWH (AQL)	0.0 mi	Outlet Blue River 10300101-0106

n/a not applicable
WBID = Waterbody IDentification: Missouri Use Designation Dataset 8-20-13 MUDD V1.0 data can be found as an ArcGIS shapefile on MSDIS at ftp://msdis.missouri.edu/pub/Inland_Water_Resources/MO_2014_WQS_Stream_Classifications_and_Use_shp.zip

* As per 10 CSR 20-7.031 Missouri Water Quality Standards, the department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses which may be found in the receiving streams table, above:
10 CSR 20-7.031(1)(C)1.:
AQL = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: WWH = Warm Water Habitat; CLH = Cool Water Habitat; CDH = Cold Water Habitat; EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)
10 CSR 20-7.031(1)(C)2.: Recreation in and on the water
WBC = Whole Body Contact recreation where the entire body is capable of being submerged;
WBC-A = Whole body contact recreation supporting swimming uses and has public access;
WBC-B = Whole body contact recreation supporting swimming;
SCR = Secondary Contact Recreation (like fishing, wading, and boating).
10 CSR 20-7.031(1)(C)3. to 7.:
HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish;
IRR = Irrigation for use on crops utilized for human or livestock consumption;
LWW = Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection);
DWS = Drinking Water Supply;
IND = Industrial water supply
10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)
WSA = Storm- and flood-water storage and attenuation; WHP = Habitat for resident and migratory wildlife species;
WRC = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = Hydrologic cycle maintenance.
10 CSR 20-7.031(6): GRW = Groundwater

RECEIVING STREAM LOW-FLOW VALUES:

OUTFALL	RECEIVING STREAM (C, P)	LOW-FLOW VALUES		
		1Q10	7Q10	30Q10
#001	Missouri River (P)	12,131 cfs	15,323 cfs	19,273 cfs
#003, #004	Blue River (P)	n/a	24.3 cfs	34.1 cfs

Low flows were calculated using a departmentally developed spreadsheet (available upon request).

- Missouri River low flow values were obtained from USGS Gaging Station #06893000 near Kansas City, MO. Data were obtained from 1/1/1970 through 05/16/2017.
- Blue River low flow values were obtained from USGS gaging station # 06893578 at Stadium Drive from 07/01/2002 through 05/16/2017.

MIXING CONSIDERATIONS TABLE:

WATERBODY	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
Missouri River (standard)	3033	3831	4818	303	383	482
Missouri River [per 10 CSR 20-7.031(5)(A)4.B.(III)(b)]	3033	3831	4818	43.4 *	43.4 *	43.4 *
CORMIX2 Model	n/a	535 **	n/a	n/a	446 **	n/a
Blue River	n/a	6	9	n/a	0.6	0.9

* Per 10 CSR 20-7.031(5)(A)4.B.(III)(b): ZID cannot be more than 10 times the facility design flow. DF = 4.34 MGD

** The facility has installed a diffuser which allows for a larger zone of initial dilution per 10 CSR 20-7.031 (5)(A)4.B.(III)(b). In a CORMIX2 model dated 2/5/2008 submitted to the department, the model showed the effluent was completely mixed at the ZID at 446 times the effluent at the edge of the zone of initial dilution (acute); and for the MZ at 535 times the effluent at the end of the mixing zone (chronic). These values were used to calculate water quality limitations when the 7Q10 value is used for calculations.

RECEIVING STREAM MONITORING REQUIREMENTS:
No receiving water monitoring requirements are recommended 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.

ANTI-BACKSLIDING:
Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] 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.

- ✓ 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.
  - 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.
    - Outfall #001: WET testing
  - Outfall #001 limits for WET tests have been removed; the facility has shown no reasonable potential to cause or contribute to toxicity of the receiving stream.
- ✓ 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 (condition #6) 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 contained a special condition #10 stating "All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers, including spill prevention, control, and countermeasures."
    The permittee must determine if the facility is subject to SPCC rules and follow them according; an NPDES permit does not have the authority to include such an applicability clause.
  - The previous permit contained the sampling requirements on the pumped groundwater in secondary containment for dichlorodifluoromethane, cis-1,2-dichloroethene, ethanol, styrene, 1,2,4-trichlorobenzene, xylenes, arsenic, barium, beryllium, and cobalt in special condition #11.
    "If groundwater or water from the secondary containment area will cause or have reasons to believe it will cause an upset to this facility's treatment system or alternative permitted treatment system, the facility shall contact the Department for proper treatment and disposal. Because groundwater and water from the secondary containment area is pumped and treated by the facility's treatment system, once per permit cycle testing shall be conducted on the following constituents. The below constituents must be sampled and tested in accordance with 40 CFR 136, reported in µg/L, and submitted to the Department with the next following renewal or application for modification."
    Since the facility has 1) reported this component of the discharge to the department and the department has considered the constituents for discharge; and 2) is treating the groundwater and discharging through outfall #001, these requirements are neither required nor lawful to require sampling at an internal monitoring point when no ELG is implemented.

- The previous permit contained a special condition #14.(c) which stated "In addition to the Benchmark parameters listed above, the permittee shall monitor for the following parameters of Chemical Oxygen Demand, Total Organic Pesticides Chemicals, Total Ammonia as N, Total Dissolved Solids, and the pollutants listed in 40 CFR 414.91 once per permit cycle. The monitoring sampling type shall be grab and shall recorded in mg/L. Upon the next renewal, the permittee shall submit the monitoring data as part of their operating permit renewal."
  The permit writer has determined the stormwater at the site is adequately characterized by using the parameters as benchmarks for outfalls #003 and #004 and additional sampling is not required by this permit. The list at 40 CFR 414.91 is not for stormwater.
- 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. Ammonia as N at outfall #001 was weekly sampling; however, the permit writer has noted the facility has a diffuser and no reasonable potential for this parameter. A decreased sampling frequency is warranted for ammonia as N at outfall #001.

✓ Technology-based limitations

- The previous permit included limits for pollutants listed in 40 CFR 414.91(b). The facility is not subject to that portion of the ELG. Parameters removed.
- The previous permit required sampling of toxics identified in 40 CFR 423. Sampling is not continued however, special condition #D.13. directs the facility to the same list for changes of discharges of toxic pollutants.
- Previous permit limitations for chloroform were 1.15 lbs/day daily maximum and 0.53 lbs/day monthly average. The permit writer has allowed additional technology allowances and the new limits have increased. These limits would not exceed water quality limitations.

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; no further degradation proposed therefore no further review necessary.

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 with benchmark constraints. The benchmarks listed are consistently achieved in stormwater discharges by a variety of industries with SWPPPs.

BIOSOLIDS & SEWAGE SLUDGE:
Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for beneficial use (i.e. fertilizer). 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: http://extension.missouri.edu/main/DisplayCategory.aspx?C=74 (WQ422 through WQ449).
✓ Not applicable; this condition is not applicable to the permittee for this facility.

CHANGES IN DISCHARGES OF TOXIC POLLUTANT:
This special condition reiterates the federal rules found in 40 CFR 122.44(f) and 122.42(a)(1). In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "…any pollutant listed as toxic under section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the clean water act then refers to those parameters found in 40 CFR 401.15.

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.

***DE MINIMIS* LOSSES – 40 CFR 261.3(A)(2)(IV)(D)**
The facility seeks coverage under the *de minimis* losses provision. This regulation is often referred to as the "headworks exemption." As found in 40 CFR §261.3(a)(2)(iv)(D), de minimis losses are defined as inadvertent releases to the wastewater treatment system, including those from normal material handling operations (e.g., spills from the unloading or transfer of materials from bins or other containers, leaks from pipes, valves or other devices used to transfer materials); minor leaks of process equipment, storage tanks or containers; leaks from well-maintained pump packings and seals; sample purgings; relief device discharges; discharges from safety showers and rinsing and cleaning of personal safety equipment; and rinsate from empty containers or from containers that are rendered empty by that rinsing. Losses under this section may only be considered when the losses are from normal operating procedures at well maintained facilities as opposed to neglectful or careless management practices. Inadvertent in this instance means the permittee is not covered by the special condition for losses resulting from the mismanagement, neglectfulness, or carelessness during operating the facility.

At the time of permit renewal, Bayer gave notice of the possible inadvertent release of *de minimis* quantities of F001, F002, F003, F005, P022, U161, U220, U239, U244, U279, U409, and U410 hazardous wastes to the facility's wastewater treatment plant per 40 CFR §261.3(a)(2)(iv)(D).

During the pre-public notice review process in September 2017, the facility indicated the following additional parameters were inadvertently left off but necessary to be included in the headworks exemption. The additions were as follows: F004, P014, P024, P066, P069, P070, P127, P199, U002, U003, U006, U012, U019, U029, U031, U037, U041, U043, U045, U052, U056, U057, U070, U071, U072, U077, U079, U080, U081, U103, U112, U117, U122, U123, U129, U133, U140, U154, U159, U169, U188, U189, U196, U210, U221, U240, U359, U404, and U411. The table below was changed to reflect the addition of these parameters and remarks were completed by the permit writer at that time. The permit special condition was also updated to include the full list of the parameters.

The following table identifies potential *de minimis* losses applicable to hazardous wastes at the facility under §261.31 and §261.33, expected constituents for each waste, and each wastes' land disposal constituents appearing in §268.40. EPA has repeatedly stated that a facility's identification of *de minimis* losses is not, in and of itself, justification to include a permit limit for a particular parameter. The following constituents are approved under the *de minimis* losses rule. The approval's primary reason is to avoid a hazardous waste listing of the wastewater sludges but does not negate any sampling required by this NPDES permit.

WASTE CODE	CONSTITUENTS APPEARING IN APPENDIX VII OF 40 CFR §261	CONSTITUENTS APPEARING IN §268.40	REMARKS:
F001	methylene chloride	methylene chloride	No WQ RP
F002	methylene chloride	methylene chloride	No WQ RP
F003	not applicable	acetone ethyl acetate n-butyl alcohol methanol methyl isobutyl ketone xylenes-mixed isomers	Note 1 Note 1 Note 1 Note 1 Note 1 Note 1
F004	cresols cresylic acid nitrobenzene	cresols cresylic acid nitrobenzene	Note 1 Note 1 Note 1
F005	isobutanol methyl ethyl ketone toluene	isobutanol methyl ethyl ketone toluene	Note 1 Note 1 No WQ RP
P014	not applicable	benzenethiol	Note 1
P022	not applicable	carbon disulfide	Note 2
P024	not applicable	benzenamine, 4-chloro- {aka, p-chloraniline}	Note 1
P066	not applicable	methomyl	Note 1
P069	not applicable	acetone cyanohydrin {aka, 2-methyllactonitrile}	Note 1
P070	not applicable	aldicarb	Note 1
P127	not applicable	carbofuran	Note 1
P199	not applicable	formetanate hydrochloride {aka, methiocarb}	Note 1
U002	not applicable	acetone	Note 1
U003	not applicable	acetonitrile	Note 1
U006	not applicable	acetyl chloride	Note 1
U012	not applicable	aniline	Note 1
U019	not applicable	benzene	ELG Requirement
U029	not applicable	methyl bromide {aka, bromomethane}	Note 1
U031	not applicable	n-butyl alcohol {aka, 1-butanol}	Note 1
U037	not applicable	chlorobenzene	Note 1
U041	not applicable	epichlorohydrin {abbr. ECH}	Note 1
U043	not applicable	vinyl chloride	Note 1
U045	not applicable	methyl chloride {aka, chloromethane}	ELG Requirement, no WQ RP
U052	not applicable	cresol (cresylic acid) o-Cresol {aka, 2-methylphenol} m-Cresol {aka, 3-methylphenol} p-Cresol {aka, 4-methylphenol}	Note 1 Note 1 Note 1 Note 1
U056	not applicable	cyclohexane	Note 1
U057	not applicable	cyclohexanone	Note 1
U070	not applicable	orthodichlorobenzene {aka, 1, 2-dichlorobenzene}	ELG Requirement
U071	not applicable	m-dichlorobenzene {aka, 1,3-dichlorobenzene}	Note 1
U072	not applicable	paradichlorobenzene {aka, 1, 4-dichlorobenzene}	ELG Requirement
U077	not applicable	ethylene dichloride {abbr. EDC; aka, 1,2-dichloroethane}	Note 1
U079	not applicable	1,2-dichloroethylene	ELG Requirement
U080	not applicable	methylene chloride	ELG Requirement
U081	not applicable	2,4-dichlorophenol	ELG Requirement
U103	not applicable	dimethyl sulfate	Note 1
U112	not applicable	ethyl acetate	Note 1
U117	not applicable	ethyl ether	Note 1
U122	not applicable	formaldehyde	No WQ RP
U123	not applicable	formic acid	Note 1
U129	not applicable	lindane alpha-BHC beta-BHC delta-BHC gamma-BHC (Lindane)	Note 1 Note 1 Note 1 Note 1 Note 1

WASTE CODE	CONSTITUENTS APPEARING IN APPENDIX VII OF 40 CFR §261	CONSTITUENTS APPEARING IN §268.40	REMARKS:
U133	not applicable	hydrazine	Note 1
U140	not applicable	isobutyl alcohol	Note 1
U154	not applicable	methanol	Note 1
U159	not applicable	methyl ethyl ketone (MEK)	Note 1
U161	not applicable	methyl isobutyl ketone	Note 1
U169	not applicable	nitrobenzene	Note 1
U188	not applicable	phenol	ELG Requirement, Note 4
U189	not applicable	sulfur phosphide	Note 1
U196	not applicable	pyridine	Note 1
U210	not applicable	tetrachloroethylene	Note 1
U220	not applicable	toluene	ELG Requirement, No WQ RP
U221	not applicable	toluenediamine	Note 1
U239	not applicable	xylenes-mixed isomers	Note 1
U240	not applicable	2,4-D, salts, esters and acids	Note 1, Note 5
U244	not applicable	thiram	Note 1
U279	not applicable	carbaryl	Note 3
U359	not applicable	ethylene glycol monoethyl ether {aka, 2-ethoxyethanol}	Note 1
U404	not applicable	triethylamine	Note 1
U409	not applicable	thiophanate-methyl	Note 1
U410	not applicable	thiodicarb	Note 1
U411	not applicable	propoxur	Note 1, Note 5

Note 1: Parameter not reported as believed present in the discharge from outfall #001 on any of the application for permit renewal, addendums to permit applications, or supporting documents therefore no further sampling required.
Note 2: Permittee reported this parameter believed present in the discharge from outfall #001 but did not supply data. Sampling will be required for this parameter.
Note 3: Permittee reported this parameter believed present in the discharge from outfall #001 but sampling has shown it is not a parameter of concern therefore no further sampling is required by this permit.
Note 4: The permit application identified total phenols as present in the discharge; phenol is but one of twelve phenolic compounds within the array of total phenols. There is no water quality limitation for total phenols, however, there are acute and chronic limitations for phenol. See fact sheet.
Note 5: This parameter is contained within the total organic pesticide chemical analysis.
ELG Requirement: This parameter has a requirement based on technology effluent limitations.
No WQ RP: Data exists for this parameter and a statistical analysis was performed. No water quality reasonable potential was found therefore no further sampling is required; or there is no water quality standard for this pollutant.

ELG -EFFLUENT LIMITATION GUIDELINES:
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 associated Effluent Limit Guidelines (ELGs) which are applicable to the wastewater discharge at this facility. The table located in Part IV Outfall #001 Table 2 shows the limits in the ELGs. Should water-quality derived effluent limits be more protective of the receiving water's quality, the WQS will be used as the limiting factor.
  - ✓ 40 CFR 401: General Provisions, §401.17; pH under continuous monitoring
  - ✓ 40 CFR 455: Pesticide Chemicals, Subpart A: Organic Pesticides Manufacturing Subcategory;
  - ✓ 40 CFR 455: Pesticide Chemicals, Subpart C: Pesticide Chemicals Formulating and Packaging Subcategory;
  - ✓ 40 CFR 444: Waste Combustors, Subpart A: Commercial Hazardous Waste Subcategory (BPJ);
  - ✓ 40 CFR 415: Inorganic Chemicals, Subpart BB: Sodium Bisulfite Production Subcategory;
  - ✓ 40 CFR 414: Organic Chemicals, Plastics, and Synthetic Fibers, Subpart H: Specialty Organic Chemicals Subcategory; BPJ only
  - ✓ 40 CFR 423: appendix A priority pollutants; and

- ✓ 40 CFR 129.6: adjustment of effluent standards for intake water pollutants (not applicable, see Chloroform narrative). This rule was evaluated per 40 CFR 401 but is not applied as the facility does not manufacture or formulate the following: (a) Aldrin/Dieldrin—*Aldrin* means the compound aldrin as identified by the chemical name, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4 -endo-5,8-exo-dimethanonaphthalene; "Dieldrin" means the compound the dieldrin as identified by the chemical name 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-5,8-exo-dimethanonaphthalene. (b) DDT—*DDT* means the compounds DDT, DDD, and DDE as identified by the chemical names: (DDT)-1,1,1-trichloro-2,2-bis(p-chlorophenyl) ethane and someo,p′-isomers; (DDD) or (TDE)-1,1-dichloro-2,2-bis(p-chlorophenyl) ethane and some o,p′-isomers; (DDE)-1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene. (c) Endrin—*Endrin* means the compound endrin as identified by the chemical name 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-5,8-endodimethanonaphthalene. (d) Toxaphene—*Toxaphene* means a material consisting of technical grade chlorinated camphene having the approximate formula of C_{10} H_{10} Cl_8 and normally containing 67-69 percent chlorine by weight. (e) Benzidine—*Benzidine* means the compound benzidine and its salts as identified by the chemical name 4,4′-diaminobiphenyl. (f) Polychlorinated Biphenyls (PCBs) *polychlorinated biphenyls* (PCBs) means a mixture of compounds composed of the biphenyl molecule which has been chlorinated to varying degrees.

ELG Table 1: Maximum Production: Form C - Item 2.50

OPERATION	**PRODUCT & ACTION**	**QUANTITY**
Pesticide Manufacturing	See *ELG Table 2*	491,050 lbs/day * (value does not include intermediates)
Formulation of Chemical Pesticides	See *ELG Table 2*	total formulated 215,028 lbs/day
Formulation of Biological Pesticides	*Bacillus firmus* (bacterial nematode insecticide)	23,892 lbs/day
Manufacture of Inorganic Compounds	Sodium Hypochlorite (removed Sodium Sulfhydrate*); bleach	88,936 lbs/day *
Environmental Pollution Control Equipment	Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	62,669 lbs/day
Hazardous Waste Combustor	Incineration of aqueous and organic waste in Thermal Oxidizer II (Outfalls #001 and #002)	296,300 gals/day (99th %) 283,667 gals/day (95th %)
Intermediate Production	Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	768,377 gallons/day *

All operations apply to outfall #001 unless otherwise stated.
* Value modified per letter dated July 14, 2017.

- ✓ The permittee provided explanations for best professional judgment (BPJ) inclusions of allowances at outfall #001 for BOD_5, COD, TSS, and chloroform. The permit writer has reviewed the requested allowances and determined them to be relevant to the discharges. See the application for permit addendum *Background Information in Support of Wastewater Permit Renewal Application*; December 16, 2016. See Part IV-Derivation and Limits discussion for outfall #001.

BPT: CWA 304(b)(1) the best practicable control technology – see individual parameters in Part V
BAT: CWA 301(b)(2)(A) the best available technology economically achievable
BAT is used for non-conventional and toxic pollutants.
301(b)(2)(A) categories and classes of point sources which discharge toxic and non-conventional pollutants must use BAT to result in national goal of elimination of pollution. 301(b)(2)(C) and (D) state that deadline for toxics to comply with BAT is 1989.
301(b)(2)(F) states that deadline for non-conventional to comply with BAT is 1989. BPTs are still provided in statute because BPT must still be met even if a variance is granted from BATs.

ELG Table 2: Bayer Products Containing Pesticide Active Ingredients (PAIs) 2015 data

Product	Pesticide Active Ingredient	Action	CAS #	Manu.	Form.
23/36 Fungicide	Thiophanate-Methyl	fungicide	317815-83-1		Y
26/36 Fungicide	Iprodione	hydantoin fungicide and nematicide	36734-19-7		Y
Absolute	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	Y
Absolute	Trifloxystrobin	fungicide	141517-21-7		Y
Acceleron D-281	Fluoxastrobin	broad spectrum fungicide	361377-29-9		Y
Acceleron DC 309	Metalaxyl	systemic fungicide	57837-19-1		Y
Adament	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	Y
Adament	Trifloxystrobin	fungicide	141517-21-7		Y
Adengo	Isoxaflutole	herbicide	141112-29-0		Y
Adengo	Thiencarbazone-Methyl	herbicide	317815-83-1		Y
Admire	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
AE 309	Pyrasulfotole	herbicide; biosynthesis and photosynthesis inhibitor	365400-11-9	Y - Solid	
AE 747	Tembotrione	post-emergence tri-ketone herbicide for broadleaf and grassy weeds in corn	335104-84-2	Y - Liquid	Y
Aeris	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Aeris	Thiodicarb	carbamate insecticide	59669-26-0		Y
Alantro	Thiacloprid	neonicotinoid insecticide	111988-49-9		Y
Alias	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Allegiance	Metalaxyl	systemic fungicide	57837-19-1		Y
Alliette	Fosetyl-Al	systemic fungicide	39148-24-8		Y
Armada	Triadimefon	fungicide	43121-43-3		Y
Armada	Trifloxystrobin	fungicide	141517-21-7		Y
Aspire	Isoxadifen-ethyl	safener	163520-33-0		Y
Aspire	Tembotrione	post-emergence tri-ketone herbicide for broadleaf and grassy weeds in corn	335104-84-2	Y - Liquid	Y
Attribut	Propoxycarbazone-sodium	post-emergence herbicide; wheat	181274-15-7	Y - Solid	
Axiom	Flufenacet	pre-emergence herbicide; soil application	142459-58-3	Y - Solid	
Axiom	Metribuzin	pre- and post-emergence herbicide	21087-64-9	Y - Solid	
Aztec	Cyfluthrin	household pesticide	68359-37-5		Y
Balance	Cyclanilide	plant growth regulator; cotton harvest aid	113136-77-9	Y - Solid	
Balance Flexx	Cyprosulfamide	safener	221667-31-8		Y
Balance Flexx	Isoxaflutole	herbicide	141112-29-0		Y
Balance Pro	Isoxaflutole	herbicide	141112-29-0		Y
Banner	Propiconazole	fungicide for turf grasses and ornamentals	178928-70-6		Y
Bariard	Thiacloprid	neonicotinoid insecticide	111988-49-9		Y
BAY FOE 5043	Flufenacet	pre-emergence herbicide; soil application	142459-58-3	Y - Solid	
BAY MKH 1651	Propoxycarbazone-sodium	post-emergence herbicide; wheat	181274-15-7	Y - Solid	
Bayleton	Triadimefon	fungicide	43121-43-3		Y
Baythroid XL	Beta-cyfluthrin	insecticide	68359-37-5		Y
Baythroid XL	Cyfluthrin	household pesticide	68359-37-5		Y
Belt	Flubendiamide	insecticide	272451-65-7		Y
Biscaya	Thiacloprid	neonicotinoid insecticide	111988-49-9		Y

Product	Pesticide Active Ingredient	Action	CAS #	Manu.	Form.
CaLypso	Thiacloprid	neonicotinoid insecticide	111988-49-9		Y
Capreno	Isoxadifen-ethyl	safener	163520-33-0		Y
Capreno	Tembotrione	post-emergence tri-ketone herbicide for broadleaf and grassy weeds in corn	335104-84-2		Y
Capreno	Thiencarbazone-Methyl	herbicide	317815-83-1		Y
Cerone	Ethephon	plant growth regulator; ripening accelerator	16672-87-0		Y
Chipco Proxy	Ethephon	plant growth regulator; ripening accelerator	16672-87-0		Y
Chipco Signature	Fosetyl-Al	systemic fungicide	39148-24-8		Y
Chipco Triton	Triticonazole	fungicide	131983-72-7		Y
Clean Up Pour On	Permethrin	insecticide	52645-53-1		Y
Converge Flex	Cyprosulfamide	safener	221667-31-8		Y
Co-Ral	Coumaphos	organophosphate ectoparasitic insecticide	56-72-4		Y
Co-Ral 4F	Coumaphos	organophosphate ectoparasitic insecticide	56-72-4		Y
Corvus	Isoxaflutole	herbicide	141112-29-0		Y
Corvus	Thiencarbazone-Methyl	herbicide	317815-83-1		Y
Cyfluthrin	Cyfluthrin	household pesticide	68359-37-5		Y
CyLence	Cyfluthrin	household pesticide	68359-37-5		Y
Decis	Deltamethrin	pyrethroid insecticide	52618-63-5		Y
Define	Flufenacet	pre-emergence herbicide; soil application	142459-58-3	Y - Solid	
Delta Gold	Deltamethrin	pyrethroid insecticide	52618-63-5		Y
Diflexx	Dicamba	selective herbicide	1918-00-9	Y - Liquid *	Y
Diflexx Duo	Dicamba	selective herbicide	1918-00-9	Y - Liquid *	Y
Distinguish	Pyrimethanil	broad spectrum fungicide	53112-28-0		Y
Distinguish	Trifloxystrobin	fungicide	141517-21-7		Y
Domain	Flufenacet	pre-emergence herbicide; soil application	142459-58-3	Y - Solid	
Domain	Metribuzin	pre- and post-emergence herbicide	21087-64-9	Y - Solid	
Dursban	Chlorpyrifos	organophosphate insecticide, acaricide and miticide used primarily to control foliage and soil-borne insect pests	2921-88-2		Y
Ekvator	Cyclanilide	plant growth regulator; cotton harvest aid	113136-77-9	Y - Solid	
Ekvator	Cyclanilide	plant growth regulator; cotton harvest aid	113136-77-9		Y
Elite	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0		Y
Elite	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	
Emesto Silver	Penflufen	fungicide	494793-67-8		Y
Emesto Silver	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y
Envidor	Spirodiclofen	acaricide and insecticide	148477-71-8		Y
Epic	Flufenacet	pre-emergence herbicide; soil application	142459-58-3	Y - Solid	
Epic	Isoxaflutole	herbicide	141112-29-0		Y
Ethrel	Ethephon	plant growth regulator; ripening accelerator	16672-87-0		Y
Evergol Energy	Metalaxyl	systemic fungicide	57837-19-1		Y
Evergol Energy	Penflufen	fungicide	494793-67-8		Y

Product	Pesticide Active Ingredient	Action	CAS #	Manu.	Form.
Evergol Energy	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y
Evergol Prime	Penflufen	fungicide	494793-67-8		Y
Evergol Xtend	Penflufen	fungicide	494793-67-8		Y
Evergol Xtend	Trifloxystrobin	fungicide	141517-21-7		Y
Finish	Cyclanilide	plant growth regulator; cotton harvest aid	113136-77-9	Y - Solid	Y
Finish	Ethephon	plant growth regulator; ripening accelerator	16672-87-0		Y
Flint	Trifloxystrobin	fungicide	141517-21-7		Y
Florel	Ethephon	plant growth regulator; ripening accelerator	16672-87-0		Y
Folicur	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	Y
Gaucho	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Gem	Trifloxystrobin	fungicide	141517-21-7		Y
Interface	Iprodione	hydantoin fungicide and nematicide	36734-19-7		Y
Interface	Trifloxystrobin	fungicide	141517-21-7		Y
Isoxaben 35 TK	Isoxaben	broadleaf pre-emergence herbicide	82558-50-7		Y
JAU 6476	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	
Kontos	Spirotetramat	insecticide	203313-25-1		Y
Larvin	Thiodicarb	carbamate insecticide	59669-26-0		Y
Laudis	Isoxadifen-ethyl	safener	163520-33-0		Y
Laudis	Tembotrione	post-emergence tri-ketone herbicide for broadleaf and grassy weeds in corn	335104-84-2	Y - Liquid	Y
Leverage	Cyfluthrin	household pesticide	68359-37-5		Y
Leverage	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Luna Sensation	Fluopyram	fungicide	658066-35-4		Y
Luna Sensation	Trifloxystrobin	fungicide	141517-21-7		Y
Luna Tranquility	Fluopyram	fungicide	658066-35-4		Y
Luna Tranquility	Pyrimethanil	broad spectrum fungicide	53112-28-0		Y
Merit	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Monarca	Thiacloprid	neonicotinoid insecticide	111988-49-9		Y
Movento	Spirotetramat	insecticide	203313-25-1		Y
Nortica WP	*Bacillus firmus*	bacterial nematode insecticide	n/a		Y
Norton	Ethofumesate	pre-, early-, and post-emergence herbicide	26225-79-6		Y
Oberon	Spiromesifen	acaricide and insecticide	283594-90-1		Y
Olympus	Propoxycarbazone-sodium	post-emergence herbicide; wheat	181274-15-7	Y - Solid	
Orbit	Propiconazole	fungicide for turf grasses and ornamentals	178928-70-6		Y
Palliser	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0		Y
Permectin	Permethrin	insecticide	52645-53-1		Y
Permectin II	Permethrin	insecticide	52645-53-1		Y
Poncho	Clothiandin	insecticide; neonicotinoid	205510-53-8		Y
Poncho Votivo	*Bacillus firmus*	bacterial nematode insecticide	n/a		Y
Premise	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Prep	Ethephon	plant growth regulator; ripening accelerator	16672-87-0		Y
Preventol	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	
Prokoz Sevin DW	Carbaryl	insecticide	63-25-2		Y
Proline	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y

Product	Pesticide Active Ingredient	Action	CAS #	Manu.	Form.
Propulse	Fluopyram	fungicide	658066-35-4		Y
Propulse	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y
Prosaro	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y
Prosaro	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	Y
Prosper	Clothiandin	insecticide; neonicotinoid	205510-53-8		Y
Prosper	Metalaxyl	systemic fungicide	57837-19-1		Y
Prosper	Trifloxystrobin	fungicide	141517-21-7		Y
Prostar WP	Flutolanil	fungicide	66332-96-5		Y
Proteus	Thiacloprid	neonicotinoid insecticide	111988-49-9		Y
Provado	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Provost	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	Y
Provost	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y
Radius	Flufenacet	pre-emergence herbicide; soil application	142459-58-3	Y - Solid	
Radius	Isoxaflutole	herbicide	141112-29-0		Y
Ravap	Dichlorvos	acetylcholinesterase inhibitive pesticide	62-73-7		Y
Ravap	Tetrachlorvinphos	organophosphate insecticide	22248-79-9		Y
Raxil	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0	Y - Solid	
Raxil MD	Metalaxyl	systemic fungicide	57837-19-1		Y
Raxil MD	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0		Y
Reason	Fenamidone	foliar fungicide	161326-34-7		Y
Ronstar	Oxadiazon	herbicide used for pre-emergent control of grasses, broadleaves, vines, brambles, brush, and trees	19666-30-9		Y
Rootone	Thiram	fungicide and ectoparasiticide	137-26-8		Y
Rovral	Iprodione	hydantoin fungicide and nematicide	36734-19-7		Y
Rpreventol	Tebuconazole	fungicide for mildews, rusts, and blights	80443-41-0		Y
Scala	Pyrimethanil	broad spectrum fungicide	53112-28-0		Y
Sencor	Metribuzin	pre- and post-emergence herbicide	21087-64-9	Y - Solid	Y
Sepresto	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Seprestro	Clothiandin	insecticide; neonicotinoid	205510-53-8		Y
Sevin	Carbaryl	insecticide	63-25-2		Y
Sivanto	Flupyradifurone	systemic insecticide	951659-40-8		Y
Soberan	Isoxadifen-ethyl	safener	163520-33-0		Y
Soberan	Tembotrione	post-emergence tri-ketone herbicide for broadleaf and grassy weeds in corn	335104-84-2	Y - Liquid	Y
Stance	Cyclanilide	plant growth regulator; cotton harvest aid	113136-77-9	Y - Solid	Y
Storcide II	Chlorpyrifos	organophosphate insecticide, acaricide and miticide used primarily to control foliage and soil-borne insect pests	2921-88-2		Y
Storcide II	Deltamethrin	pyrethroid insecticide	52618-63-5		Y
Stratego	Propiconazole	fungicide for turf grasses and ornamentals	178928-70-6		Y
Stratego	Trifloxystrobin	fungicide	141517-21-7		Y
Stratego Yield	Prothioconazole	broad-spectrum systemic fungicide	178928-70-6	Y - Solid	Y

Product	Pesticide Active Ingredient	Action	CAS #	Manu.	Form.
Stratego Yield	Trifloxystrobin	fungicide	141517-21-7		Y
Tartan	Triadimefon	fungicide	43121-43-3		Y
Tartan	Trifloxystrobin	fungicide	141517-21-7		Y
Tega	Trifloxystrobin	fungicide	141517-21-7		Y
Tempo 10% WP	Beta-cyfluthrin	insecticide	68359-37-5		Y
Tempo 10% WP	Cyfluthrin	household pesticide	68359-37-5		Y
Temprid	Beta-cyfluthrin	insecticide	68359-37-5		Y
Temprid	Imidacloprid	insecticide; insect neurotoxin; neonicotinoid	138261-41-3		Y
Tilt	Propiconazole	fungicide for turf grasses and ornamentals	178928-70-6		Y
Titan	Clothiandin	insecticide; neonicotinoid	205510-53-8		Y
Trilex	Trifloxystrobin	fungicide	141517-21-7		Y
Trilex Optimum	Captan	fungicide	133-06-2		Y
Trilex Optimum	Metalaxyl	systemic fungicide	57837-19-1		Y
Trilex Optimum	Thiophanate-Methyl	fungicide	317815-83-1		Y
Trilex Star	Captan	fungicide	133-06-2		Y
Trilex Star	Metalaxyl	systemic fungicide	57837-19-1		Y
Trilex Star	Thiophanate-Methyl	fungicide	317815-83-1		Y
Triton	Triticonazole	fungicide	131983-72-7		Y
Tundra	Pyrasulfotole	herbicide; biosynthesis and photosynthesis inhibitor	365400-11-9	Y - Solid	
Twist Duo	Pyrimethanil	broad spectrum fungicide	53112-28-0		Y
Twist Duo	Trifloxystrobin	fungicide	141517-21-7		Y
Ultar	Spirotetramat	insecticide	203313-25-1		Y
Votivo	*Bacillus firmus*	bacterial nematode insecticide	n/a		Y

Notes:

CAS: Chemical Abstracts Service
Manu: manufactured
Form: formulated
A safener is defined as enhancing herbicide selectivity and increasing the speed at which plant enzymes metabolize herbicides into nontoxic substances.

GROUNDWATER MONITORING:

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

✓ This facility is monitoring the groundwater at the site under MOD056389828 for the hazardous waste program. The facility is not required to report the data to the water protection program at this time. Additional information can be found at https://dnr.mo.gov/env/hwp/permits/activepa.htm. The hazardous waste program is the program which regulates the groundwater at this site.

INDUSTRIAL SLUDGE:

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.

✓ Not applicable, the permittee does not land apply industrial sludges. Industrial sludge is centrifuged, dried, or shipped as is to a landfill.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are (or may be) discharged at a level 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 give pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant [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.

✓ The following table shows the HHF and DWS parameters as described in the ELG. Calculations were based on the 30Q10 value of the Missouri River.

HHF/DWS Parameter	Acute WQS	Chronic WQS	Listing	Daily Max	Monthly Average	Chronic RWC	RP
1,1-Dichloroethylene	n/a	3.2	HHF	5,851.50	2,916.72	0.00	no
1,1,1-Trichloroethane	n/a	200	DWS	365,718.72	182,295.23	0.00	no
1,2-Dichloroethane	n/a	99	HHF	181,030.76	90,236.14	0.00	no
1,2-Dichloropropane	n/a	39	HHF	71,315.15	35,547.57	0.00	no
1,2-Dichlorobenzene	n/a	2600	HHF	4,754,343.30	2,369,838.00	0.00	no
1,2-trans-Dichloroethylene	n/a	140000	HHF	3,108,609.08	1,549,509.46	0.00	no
1,3-Dichloropropene {aka} 1,3-Dichloropropylene	n/a	1700	HHF	3,108,609.08	1,549,509.46	0.00	no
1,4-Dichlorobenzene	n/a	2600	HHF	4,754,343.30	2,369,838.00	0.00	no
2-Chlorophenol	n/a	400	HHF	731,437.43	364,590.46	0.00	no
2,4-Dichlorophenol	n/a	790	HHF	1,444,588.93	720,066.16	0.00	no
2,4-Dimethylphenol	n/a	2300	HHF	4,205,765.23	2,096,395.15	0.00	no
Benzene	n/a	71	HHF	129,830.14	64,714.81	0.00	no
Bromodichloromethane {aka} Dichlorobromomethane	n/a	46	HHF	84,115.30	41,927.90	0.00	no
Bromomethane {aka} Methyl Bromide	n/a	4000	HHF	7,314,374.31	3,645,904.61	0.00	no
Chlorobenzene	n/a	21000	HHF	38,400,465.10	19,140,999.23	0.00	no
Chloromethane {aka} Methyl Chloride	n/a	470	HHF	859,438.98	428,393.79	0.00	no
Dibromochloromethane {aka} Chlorodibromomethane	n/a	34	HHF	62,172.18	30,990.19	0.00	no
Dichloromethane {aka} Methylene Chloride	n/a	1600	HHF	2,925,749.72	1,458,361.85	0.00	no
Ethylbenzene	n/a	700	DWS	1,280,015.50	638,033.31	0.00	no
Naphthalene	n/a	20	DWS	36,571.87	18,229.52	0.00	no
Tetrachloroethylene	n/a	8.85	HHF	16,183.05	8,066.56	0.00	no
Tetrachloromethane {aka} Carbon Tetrachloride	n/a	5	HHF	9,142.97	4,557.38	0.00	no
Toluene	n/a	200000	HHF	365,718,715.27	182,295,230.72	0.00	no
Tribromomethane {aka} Bromoform	n/a	360	HHF	658,293.69	328,131.42	0.00	no
Trichloromethane {aka} Chloroform	n/a	470	HHF	859,438.98	428,393.79	0.03	no
4-4' DDD (Dichlorodiphenyldichloroethane)	n/a	0.00084	HHF	1.52	0.76	0.00	no
Fluorene	n/a	14000	HHF	25600310.07	12760666.15	0.00	no
Metribuzin	n/a	100	DWS	182859.36	91147.62	0.00	no
Total Organic Pesticide Chemicals	n/a	11596.6	HHF	37783816.64	12909111.94	0.00	no

✓ The following table shows the metals RPA. Calculations were based on the CORMIX model values of the Missouri River.

Parameter	Daily Maximum	Monthly Average	CMC	RWC Acute	CCC	RWC Chronic	n	Max/Min	CV	MF	RP
Aluminum	8250.00	4112.27	750.0	290.28	NA	NA	1	242/242	0.6	13.19	no
Copper	2287.84	1140.39	22.0	1.27	14.1	1.06	1	10/10	0.6	13.19	no
Iron	204137.58	101753.91	NA	NA	1000.0	654.33	2	11000/2920	0.6	7.39	no
Lead	1658.98	826.93	150.8	6.72	5.9	0.08	2	10/7.5	0.6	7.39	no
Nickel	16024.57	7987.57	706.1	2.95	78.5	2.46	1	23.2/23.2	0.6	13.19	no
Zinc	18748.93	9345.54	180.7	4.82	179.2	4.02	1	37.9/37.9	0.6	13.19	no

All metals values are based on protection of aquatic life, are in total recoverable, and in µg/L.

✓ The following table shows the whole effluent toxicity RPA based on the CORMIX model for the Missouri River.

WET testing	WQS Acute	WQS Chronic	Listing	Daily Max	Monthly Average	RWC Acute	RWC Chronic	Acute RP	Chronic RP
Acute-Daphnid	0.3	n/a	AQL	133.8	n/a	4.29	n/a	no	n/a
Acute-Fish	0.3	n/a	AQL	133.8	n/a	4.29	n/a	no	n/a
Chronic-Daphnid	0.3	1	AQL	495.1	n/a	n/a	4.30	n/a	no
Chronic-Fish	0.3	1	AQL	495.1	n/a	n/a	4.30	n/a	no

✓ The permit writer completed an RPD, a reasonable potential determination, using best professional judgment, for all other parameters in this permit. An RPD consists of reviewing application data and/or discharge monitoring data for the last five years and comparing those data to narrative or numeric water quality criteria. See Part IV.

✓ 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 IV provides specific decisions related to this permit.

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; this permit contains an SOC for *E. coli*.

Secondary Containment:
The permittee sends all accumulated water present in secondary containment areas to the on-site wastewater treatment facility for discharge through outfall #001 after treatment.

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

Stormwater 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*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to 1) identify sources of pollution or contamination, and 2) select and carry out actions which prevent or control the pollution of storm water discharges.

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

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

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

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

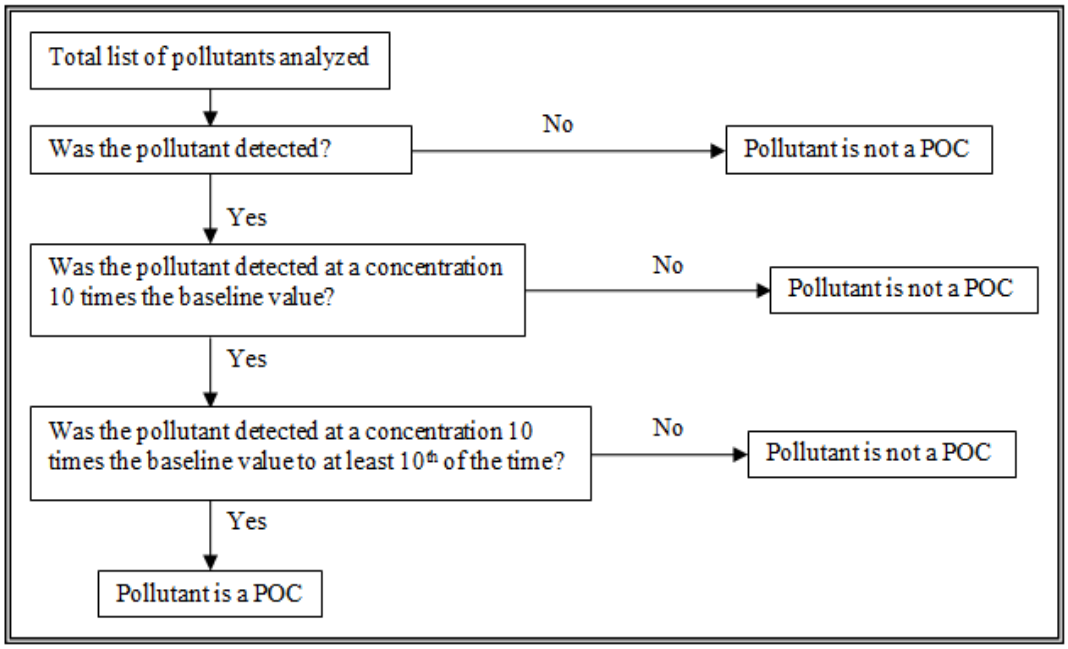
If parameter-specific numeric exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification; the application is found at: http://dnr.mo.gov/forms/index.html.

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

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

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

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



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

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

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

For BAT requirements (toxic and non-conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The cost of achieving such effluent reduction

Best Practicable Control Technology Currently Available (BPT) is the first level of technology-based effluent controls for direct dischargers and it applies to all types of pollutants (conventional, nonconventional, and toxic). The Federal Water Pollution Control Act (FWPCA) amendments of 1972 require when EPA establishes BPT standards, it must consider the industry-wide cost of implementing the technology in relation to the pollutant-reduction benefits. EPA also must consider the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA §304(b)(1)(B)]. Traditionally, EPA establishes BPT effluent limitations on the basis of the average of the best performance of well-operated facilities in each industrial category or subcategory. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the agency determines the technology can be practically applied. See CWA sections 301(b)(1)(A) and 304(b)(1)(B). Because the EPA has not promulgated TBELs for the pollutants identified as POCs, the permit writer follows the same format to establish site-specific TBELs. Although the numerical effluent limitations and standards are based on specific processes or treatment technologies to control pollutant discharges, EPA does not require dischargers to use these technologies. Individual facilities may meet the numerical requirements using whatever types of treatment technologies, process changes, and waste management practices they choose.

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

✓ Not applicable; the permittee is subject to several ELGs therefore those technology limitations will be used instead of an individual TBEL POC analysis.

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 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; a WLA study including model was submitted to the department by GBMc & Associated on behalf of the permittee, Bayer CropScience. The WLA study determined the zone of initial dilution for the acute parameters to be much larger with a diffuser (as installed). The study also defined the mixing zone for chronic parameters to be smaller, about one quarter of the size as is allowed by Missouri regulations; therefore, to be protective of the receiving streams, the mixing zone study was used to also derive the chronic limitations.

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.

WET -WHOLE EFFLUENT TOXICITY (WET) TEST:
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.

- ✓ Applicable; under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures 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
  - ☒ Facility alters its production process throughout the year
  - ☒ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts
  - ☒ Other – See derivation under outfall #001.

Part IV. EFFLUENT LIMITS DETERMINATION

Effluent limitations derived and established in the below effluent limitations table 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.

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.

Outfalls #002 and #005 are not included in this discussion as internal monitoring points at this facility are not subject to water quality evaluations.

(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 all outfalls have TSS limitations or benchmarks, however, they are all based on technology for the processes involved.

(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; specific toxic pollutants are discussed below in Derivation and Discussion of Limits, and where appropriate, numeric effluent limitations added.

(E) There shall be no significant human health hazard from incidental contact with the water.
- Specific toxic pollutants are discussed below in Derivation and Discussion of Limits, and where appropriate, numeric effluent limitations added. Much like the condition above, the permit writer has considered specific toxic pollutants, including those pollutants that could cause human health hazards. The discharge is limited by numeric effluent limitations for those conditions that could result in human health hazards.

(F) There shall be no acute toxicity to livestock or wildlife watering.
- Specific toxic pollutants are discussed below in Derivation and Discussion of Limits, and where appropriate, numeric effluent limitations added. Much like the condition above, the permit writer has considered specific toxic pollutants, including those pollutants that could cause toxicity to livestock or wildlife. The discharge is limited by numeric effluent limitations for those conditions that could result toxicity to livestock or wildlife.

(G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.
- The permittee has provided no information leading the permit writer to believe the discharges will create any changes to hydrologic characteristics that would alter natural stream conditions. The permittee has installed a diffuser which disperses the effluent throughout the river creating a much less toxic ZID and MZ than facilities using a straight pipe for discharge.
- It has previously been established that any chemical changes are covered by the specific numeric effluent limitations established in the permit. See narrative about the diffuser above.
- The permittee has provided no information leading the permit writer to believe the discharges will create any physical changes that would alter natural stream conditions.

(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.

OUTFALL #001 – PROCESS WASTEWATER

TABLE #001: EFFLUENT LIMITATIONS TABLE

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	*	SAME	ONCE/WEEK	ONCE/MONTH	TOT
CONVENTIONAL							
E. COLI (MPN/100ML)	‡	*	*	INTERIM	ONCE/WEEK	ONCE/MONTH	GRAB
E. COLI (MPN/100ML)	‡	1030	206	FINAL	ONCE/WEEK	ONCE/MONTH	GRAB
PH ǂ (NOTES 1 & 2)	SU	6.0-9.0	6.0-9.0	SAME	CONTINUOUS	ONCE/MONTH	CONT.
PH – TOTAL EXCURSION TIME (NOTE 2)	minutes	*	446 TOTAL	NEW	CONTINUOUS	ONCE/MONTH	CALC.
PH – INDIVIDUAL EXCURSION MAX (NOTE 2)	minutes	60	*	NEW	CONTINUOUS	ONCE/MONTH	CALC.

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
ELG							
BIOCHEMICAL OXYGEN DEMAND$_5$	mg/L	*	*	SAME	ONCE/WEEK	ONCE/MONTH	COMP.
BIOCHEMICAL OXYGEN DEMAND$_5$	lbs/day	5,994	1,418	£	ONCE/WEEK	ONCE/MONTH	COMP.
CHEMICAL OXYGEN DEMAND	mg/L	*	*	SAME	ONCE/WEEK	ONCE/MONTH	COMP.
CHEMICAL OXYGEN DEMAND	lbs/day	10,523	7,224	£	ONCE/WEEK	ONCE/MONTH	COMP.
TOTAL ORGANIC PESTICIDE CHEMICALS	µg/L	*	*	PREVIOUS MG/L	ONCE/WEEK	ONCE/MONTH	COMP.
TOTAL ORGANIC PESTICIDE CHEMICALS	lbs/day	7.1	2.5	10.78,4.69	ONCE/WEEK	ONCE/MONTH	COMP.
TOTAL SUSPENDED SOLIDS	mg/L	*	*	SAME	ONCE/WEEK	ONCE/MONTH	COMP
TOTAL SUSPENDED SOLIDS	lbs/day	5,776	1,726	£	ONCE/WEEK	ONCE/MONTH	COMP
ELG 455 TABLE 2 PARAMETERS							
METRIBUZIN	lbs/day	6.7	3.5	NEW	ONCE/WEEK	ONCE/MONTH	COMP.
ELG 455 TABLE 4 PARAMETERS							
1,1-DICHLOROETHYLENE	lbs/day	0.58	0.37	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
1,1,1-TRICHLOROETHANE	lbs/day	1.25	0.49	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
1,2-DICHLOROETHANE	lbs/day	4.89	1.58	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
1,2-DICHLOROPROPANE	lbs/day	5.33	3.55	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
1,2-DICHLOROBENZENE	lbs/day	3.78	1.79	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
1,2-TRANS-DICHLOROETHYLENE	lbs/day	1.25	0.49	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
1,3-DICHLOROPROPENE {AKA} 1,3-DICHLOROPROPYLENE	lbs/day	1.02	0.67	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
1,4-DICHLOROBENZENE	lbs/day	0.65	0.35	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
2-CHLOROPHENOL	lbs/day	2.27	0.72	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
2,4-DICHLOROPHENOL	lbs/day	2.60	0.90	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
2,4-DIMETHYLPHENOL	lbs/day	0.83	0.42	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
BENZENE	lbs/day	3.15	0.86	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
BROMODICHLOROMETHANE {AKA} DICHLOROBROMOMETHANE	lbs/day	8.81	3.29	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
BROMOMETHANE {AKA} METHYL BROMIDE	lbs/day	8.81	3.29	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
CHLOROBENZENE	lbs/day	0.65	0.35	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
CHLOROMETHANE {AKA} METHYL CHLORIDE	lbs/day	4.41	1.99	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
CYANIDE (TOTAL)	lbs/day	14.84	5.10	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
DIBROMOCHLOROMETHANE {AKA} CHLORODIBROMOMETHANE	lbs/day	18.41	4.54	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
DICHLOROMETHANE {AKA} METHYLENE CHLORIDE	lbs/day	2.06	0.93	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
ETHYLBENZENE	lbs/day	2.50	0.74	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
LEAD (TOTAL)	lbs/day	16.00	7.42	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
NAPHTHALENE	lbs/day	1.37	0.51	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
PHENOL	lbs/day	0.60	0.35	¥	ONCE/YEAR	ONCE/YEAR δ	COMP.
TETRACHLOROETHYLENE	lbs/day	1.30	0.51	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
TETRACHLOROMETHANE {AKA} CARBON TETRACHLORIDE	lbs/day	0.88	0.42	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
TOLUENE	lbs/day	1.85	0.60	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
TRIBROMOMETHANE {AKA} BROMOFORM	lbs/day	18.41	4.54	¥	ONCE/YEAR	ONCE/YEAR δ	GRAB
TRICHLOROMETHANE {AKA} CHLOROFORM	lbs/day	97.9	48.6	¥	ONCE/MONTH	ONCE/MONTH δ	GRAB
NUTRIENTS							
AMMONIA AS N	mg/L	*	*	*, *	ONCE/MONTH	ONCE/MONTH	COMP.
NITROGEN, TOTAL N (TN)	mg/L	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	COMP.
PHOSPHORUS, TOTAL P (TP)	mg/L	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	COMP.

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
OTHER							
CHLORIDES	mg/L	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	COMP.
SULFATE	mg/L	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	COMP.
CHLORIDES PLUS SULFATES	mg/L	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	COMP.
BIOMONITORING							
CHRONIC WET TEST	TUc	*	-	531	ONCE/YEAR	ONCE/YEAR	COMP.

TOT 24 hour total
Comp composite sample type
Cont continuous sample type
* monitoring requirement only
Ɣ see table 4 to part 455
£ see text
δ facility will also report in µg/L
CALC. calculated value
ǂ the facility will report the minimum and maximum pH values; pH is not to be averaged
‡ most probable number/100 mL; the monthly average for *E. coli* is a geometric mean; sampling only required during the recreational season, 4/1 – 10/31
NEW parameter not established in previous state operating permit
TR total recoverable
I interim
F final
Notes 1 & 2: permittee will monitor continuously and report according to permit conditions notes 1 & 2.

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL PARAMETERS

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). Previous permit required weekly observations, continued.

Temperature
The facility has cooling towers on site and discharges a thermal component. However, data supplied by the permittee shows the facility does not have reasonable potential to cause or contribute to exceedances of instream temperature standards of 90 degrees Fahrenheit as a large mixing zone is afforded for temperature. Any temperature range of liquid water from Bayer's Outfall #001 will not exceed water quality standards even when the ambient stream temperature is at a maximum and the stream flow is at a minimum as identified in the Missouri River temperature data from the USGS gage located in St. Joseph, Missouri. Monitoring not required.

CONVENTIONAL PARAMETERS

Escherichia coli (E. coli)
Limitations for this parameter are based on stream use and not facility or stream flow. The facility discharges to the Missouri River, where this segment has both WBC-B and SCR uses. The WBC-B use limitations are more stringent. A daily maximum of 1030 bacteria per 100 mL (#/100mL) and a monthly geometric mean of 206 bacteria per 100 mL during the recreational season (April 1 through October 31) only, to protect Whole Body Contact (B) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d). The previous permit did not apply this parameter; however, the facility disclosed domestic wastewater is a component of the discharge. This parameter is required because of the receiving stream's use classification. 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. During sampling for permit renewal, the facility showed 98 mpn/100 mL in February 2016 and <10 MPN/100 mL in November 2017. MPNs are the most probable number of bacteria in a sample; the units the permittee shall report in are #bacteria/100 mL. The facility will be required to sample once per week during the recreational season per 10 CSR 20-7.031(9)(D)6; grab sampling is required.

The facility supplied the following data:

Date:	Result:	Qualifier:
2/16/2016	98 mpn/100 mL	a
10/17/2017	41 mpn/100 mL	a
10/24/2017	<10 mpn/100 mL	a
10/31/2017	<10 mpn/100 mL	a
11/7/2018	10 mpn/100 mL	a
11/15/2018	<10 mpn/100 mL	b
11/30/2018	<10 mpn/100 mL	-

a: sample was received at testing laboratory beyond the method's 8 hour holding time, analysis initiated more than 8 hours, but less than 24 hours after sample collection
b: sample was received at testing laboratory beyond method's 8 hour holding time and analysis initiated more than 24 hours after sample collection

When a sample exceeds the holding time, the bacteria in the sample begin to die causing an artificially low number in the sample test result. The data supplied by the facility shows that procedural inconsistencies may have contributed to low numbers of bacteria in the analytical result; the actual time of decay is not known. The facility has requested a schedule of compliance and the permit writer has determined the facility will be granted a SOC to determine what changes are required at the treatment plant to meet the new limits and to obtain samples which are analyzed by the laboratory in a timely fashion which report in the correct units.

In a comment from the facility dated 3/13/2018, the permittee noted "#/100 mL" was not the most correct method of reporting for bacteria as found in 40 CFR 136. The permit writer changed the units to MPN/100 mL.

pH

6.0 to 9.0 SU. The Water Quality Standard at 10 CSR 20-7.031(5)(E) states water contaminants shall not cause pH to be outside the range of 6.5 to 9.0 standard pH units. The permittee uses a continuous sampling regime therefore is also subject to 40 CFR §401.17 for technology based allowances of excursions where the pH may deviate from the limitations. 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. Previous permit was weekly monitoring. The permit writer has determined allowing continuous monitoring provisions from 40 CFR 401.17 to be more stringent than simple grab water quality limitations therefore new permit limitations will be allowed.

Total Dissolved Solids (TDS)

The previous permit instituted monitoring only for this parameter as past whole effluent tests indicated dissolved solids may be a contributor to organism death during whole effluent toxicity tests. There is no water quality standard for this parameter. The facility reported between 0.4 to 11.7 mg/L of TDS in the last permit cycle, averaging ~ 2.1 mg/L. Monitoring discontinued as there are no water quality or technology limitations.

ELG REQUIREMENTS

§455.20 Applicability; description of the organic pesticide chemicals manufacturing subcategory.

This facility is applicable to 40 CFR 455.20(d). A plant that manufactures a pesticide active ingredient listed in Table 1 of this part must comply with the BAT effluent limitations and new source performance and pretreatment standards for that pesticide active ingredient listed in Table 2 (BAT and PSES) or Table 3 of this part (NSPS and PSNS). A plant that manufactures a pesticide active ingredient listed in Table 1 of this part must also comply with the BAT effluent limitations and new source performance and pretreatment standards for priority pollutants listed in Tables 4, 5 and 6 of this part. The limitations in Table 4 of this part (BAT and NSPS) are applicable to existing and new direct discharge point sources that use End-of-Pipe biological treatment. The limitations in Table 5 of this part (BAT and NSPS) are applicable to existing and new direct discharge point sources that do not use end-of-pipe biological treatment. The limitations in Table 6 of this part (PSES and PSNS) are applicable to existing and new sources that discharge to Publicly Owned Treatment Works. The permit writer reviewed the applicability per 40 CFR 122.2 to Section 455.20 Subpart A to either Table 2 or Table 3. In the EPA document https://www3.epa.gov/npdes/pubs/newsource_dates.pdf, the facility does not fall under NSPS as they were existing (as Miles Inc; Agricultural Division; Mobay Corporation) or under construction prior to 10/12/1993. The permit writer has determined Table 2 applies as one constituent from Table 1 is manufactured, not Table 3. Tables 5 and 6 do not apply to this facility.

Table 1 to Part 455 —List of Organic Pesticide Active Ingredients

EPA CENSUS CODE	PESTICIDE CODE	PESTICIDE NAME	CAS NO.	FACILITY MANUFACTURES
45	101101	Metribuzin	21087-64-9	YES

EPA CENSUS CODE	PESTICIDE CODE	PESTICIDE NAME	CAS NO.	FACILITY MANUFACTURES
98	29801	Dicamba [3,6-Dichloro-o-anisic acid]	01918-00-9	NO
98	([1])	Dicamba Salts and Esters	([1])	NO

NOTE: [1] Multiple compounds for active ingredient.
This table does not include all parameters for permit brevity (272 total chemicals, see www.ecfr.gov for complete list).

Table 2 to Part 455—Organic Pesticide Active Ingredient Effluent Limitations Best Available Technology Economically Achievable (BAT) and Pretreatment Standards for Existing Sources (PSES)

PESTICIDE	POUNDS OF POLLUTANT PER 1000 LBS PRODUCT	
	DAILY MAXIMUM SHALL NOT EXCEED	MONTHLY AVERAGE SHALL NOT EXCEED
Metribuzin	1.36×10^{-2}	7.04×10^{-3}

Dicamba
The original application reported the facility manufactured dicamba. A letter dated July 14, 2017 rescinded the original application and the facility no longer manufactures this herbicide. ELG no longer applicable for this parameter.

Metribuzin

METRIBUZIN	PERMITTEE'S VALUE	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
Facility manufactures total pesticides in lbs/day	491,050	0.0136	0.00704	0.001	6.7	3.5

The WQS for Metribuzin is 100 µg/L, there is no WQ RP. Metribuzin is an herbicide for grasses and certain broadleaf weeds therefore would not be monitored effectively through WET testing limitations. Per Appendix U of the Missouri State Operating Permit Manual for Monitoring Frequencies and Sampling Types https://dnr.mo.gov/env/wpp/permits/manual/docs/U_0.pdf (Table 1) the permit writer has determined twice monthly monitoring and reporting for this parameter is warranted as discharge traits have not been established for this pollutant. In the future, based on a memorandum issued by the EPA entitled *Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* (4/19/1996), if the facility shows exemplary performance, the department may find the permittee eligible for reduced monitoring frequency.

During the September pre-public notice comment period, the permittee requested to sample this parameter weekly. Additionally, qualifiers were added so the permittee did not have to sample for this parameter when Bayer did not manufacture or formulate this parameter. Specific reporting instructions were added to Note 5 in the permit.

§455.22 – ELG: Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
This point source shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT). The following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this paragraph which may be discharged from the manufacture of organic active ingredient.

Biochemical Oxygen Demand (BOD_5)
Previous permit limits were 8,659 pounds per day daily maximum; 1,972 pounds per day monthly average. The facility also reported in mg/L. The maximum reported was 5,658 pounds per day and 560 mg/L; the average was 1,467 lbs/day and 96.93 mg/L. The previous permit calculated BOD_5 using the building block method for technology based effluent limitations, as is found in the EPA permit writer's manual chapter 5 https://www.epa.gov/sites/production/files/2015-09/documents/pwm_chapt_05.pdf The permit writer has continued the use of this method as the most appropriate method to calculate permit limits. There are no water quality limitations for this parameter.

Applicability is discussed in Part III: ELG – Effluent Limitation Guidelines. The permit limit for BOD_5 from the manufacturing of pesticides is based on 40 CFR 455.22, Subpart A. The permit limit for BOD_5 from the contribution from the formulation of chemical pesticides is based on 40 CFR 455.22, Subpart A and the permittee's BPJ because 40 CFR 455.41(e) allows additional pounds of pollutants for rinsing of: tanks, lines, bottling equipment, and other equipment used for pesticide formulation. The permit limit for BOD_5 from the production of intermediates is based on 40 CFR 414.81 Subpart H and the permittee's BPJ. The production of intermediates results in a wastewater flow of 0.768377 MGD to the wastewater treatment facility. Since there is no appreciable BOD loading from the facility's combustor or manufacture of the inorganics, contributions from 40 CFR 444 and 40 CFR 415 are excluded from BOD_5 building block calculation presented in this section.

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000); or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)
Weekly sampling continued from the previous permit; composite sampling required.

ELG Section	Permittee's Values	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/Day	Monthly Average in lbs/day
BPT 455.22 manufactures pesticides in lbs/day	491,050	7.4	1.6	pounds per 1000 pounds	3,633.77	785.68
BPT/BPJ 455.22 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.768377	120	45	8.34	768.99	288.37
SUM					**5,994**	**1,418**

Chemical Oxygen Demand (COD)

Previous permit limits were 18,850 pounds per day daily maximum; 12,653 pounds per day monthly average. The facility also reported in mg/L. The maximum reported was 22,784 pounds per day and 1,676 mg/L; the average was 729.3 mg/L and 2,187.1 lbs/day. The previous permit calculated COD using the building block method for technology based effluent limitations, as is found in the EPA permit writer's manual chapter 5 https://www.epa.gov/sites/production/files/2015-09/documents/pwm_chapt_05.pdf The permit writer has continued the use of this method as the most appropriate method to calculate permit limits. There are no water quality limitations for this parameter.

Applicability is discussed in Part III: ELG – Effluent Limitation Guidelines. The permit limit for COD from the production of intermediates is based on 40 CFR 414 and the permittee's BPJ. The production of intermediates results in a wastewater flow of 0.768377 MGD to the wastewater treatment facility, which contributes appreciable COD to Outfall 001. Because an ELG for COD does not exist in 40 CFR 414, the ELG applicable to BOD has been utilized for accounting for contributions of COD from the production of intermediates. The permit limit for COD from hazardous waste combustion is based on the statistics of the last five years of COD data from Outfall 002. According to the ELG development document for pesticides, the derivation of pollutant loading factors are based on the "best" performance of various treatment technologies for a variety of pollutants. As such, a 25th percentile value for the average monthly value is used as a "best performance" scenario. The maximum daily value is based on 2.1 times the average monthly value, which is a factor that is also consistent with the ELG development document. Note that values below the detection limit are taken at one half of the detection limit. Outfall 002 has a long-term average flow of 0.2488 MGD.

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)
Weekly monitoring continued from the previous permit; composite sampling required.

ELG SECTION	PERMITTEE'S VALUES	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	491,050	13	9	pounds per 1000 pounds	6,383.65	4,419.45
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.768377	120	45	8.34	768.99	288.37
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %ile daily max; x2.1 monthly average	236.58	496.81
SUM					**10,523**	**7,224**

Total Organic Pesticide Chemicals

The previous permit's limits were 10.78 pounds/day maximum; 4.69 lbs/day monthly average. §455.20 - Applicability; description of the organic pesticide chemicals manufacturing subcategory.

(b) For the purpose of calculating BPT effluent limitations for organic pesticide chemicals, the provisions of this subpart are applicable to discharges resulting from the manufacture of the following organic active ingredients (PAIs): Aldrin, BHC, Captan, Chlordane, DDD, DDE, DDT, Dichloran, Dieldrin, Endosulfan, Endrin, Heptachlor, Lindane, Methoxychlor, Mirex, PCNB, Toxaphene, Trifluralin, Azinphos Methyl, Demeton-O, Demeton-S, Diazinon, Disulfoton, Malathion, Parathion Methyl, Parathion Ethyl, Aminocarb, Carbaryl, Methiocarb, Mexacarbate, Propoxur, Barban, Chlorpropham, Diuron, Fenuron, Fenuron-TCA, Linuron, Monuron, Monuron-TCA, Neubron, Propham, Swep, 2,4-D, Dicamba, Silvex, 2,4,5-T, Siduron, Perthane, and Dicofol. Of these listed PAIs, the facility manufactures metribuzin.

40 CFR 455.41(e) allows for additional BPJ considerations for tank washing (etc) and pesticide formulation. The previous permit arbitrarily used an average of the 80 lowest BAT effluent limitations found on table 2 of § 455 for the discharge allowance. The current permit writer has determined using the same multiplier values as the manufactured pesticides is more reasonable as that is then an allowable discharge of the sum of all organic pesticides.

Total Organic Pesticide Chemicals	Permittee's Value	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/day	Monthly Average in lbs/day
BPT 455.20 manufacture in lbs/day	491,050	0.01	0.0018	0.001	4.9105	0.88389
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.1**	**2.5**

Previous permit limits were higher because the permittee reported a reduction by about half in pesticide formulation values. For BPJ, the previous permit stated they used an average of the 80 lowest BAT values for pesticides from table 2; (an average of 0.00743) for the monthly average BPJ limit; 0.01 was used for the daily maximum from §455.20. Values for BPJ continued. Weekly sampling continued from previous permit. The previous permit required composite sampling; the permit writer has determined a grab sample is more appropriate as certain organic chemicals may degrade over time and cause falsely low effluent values.

There is no singular water quality standard for total organic pesticides, however, the permit writer has determined a summation of the pesticides listed in the applicability standard should be compared to the discharge. After mathematical evaluation, there is no WQ RP for total organic pesticide chemicals.

Total Suspended Solids (TSS)
Previous permit limitations were 7,957 pounds per day maximum, and 2,355 pounds per day monthly average and the facility also reported in concentration. There is no water quality standard for TSS. The facility reported maximum 2,804 pounds and 316 mg/L; average was The previous permit calculated TSS using the building block method for technology based effluent limitations, as is found in the EPA permit writer's manual chapter 5 https://www.epa.gov/sites/production/files/2015-09/documents/pwm_chapt_05.pdf The permit writer has continued the use of this method as the most appropriate method to calculate permit limits. There are no water quality limitations to compare for this parameter.

Applicability is discussed in Part III: ELG – Effluent Limitation Guidelines. The permit limit for TSS from contribution from hazardous waste combustion is based on 40 CFR 444, Subpart A per the permittee's BPJ. The combustion of hazardous wastes results in a wastewater flow of 0.284 MGD to the wastewater treatment facility. The permit limit for TSS from production of inorganic compounds, specifically sodium hypochlorite and sodium sulfhydrate is based on 40 CFR 415, Subpart BB per the permittee's BPJ. The facility manufactures 116,158 pounds/day of these compounds.

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)
Weekly composite sampling required. The facility will also report in mg/L.

ELG Section	Permittee's Values	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/day	Monthly Average in lbs/day
BPT 455.22 pesticide manufacture in lbs/day	491,050	6.1	1.8	pounds per 1000 pounds	2,995.41	883.89
BPT/BPJ 455.22 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.768377	183	57	8.34	1,172.71	365.27
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**5,776**	**1,726**

§455 Table 4: Pesticide Chemicals; BAT & NSPS – Effluent limitations for priority pollutants for direct discharge point sources that use end-of-pipe biological treatment.

Process wastewater generated by the facility's manufacture of intermediates and intermediate precursors, in the synthesis of a pesticide active ingredient, are subject to Subpart H of 40 CFR 414 Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) effluent regulations. This is because the pesticide manufacturing ELG regulations codified in Subpart A of 40 CFR Part 455 is applicable only to process wastewater associated with the final step in the manufacture organic pesticide active ingredients. Organic chemicals being manufactured as an intermediate, or an intermediate precursor, in the manufacture of a pesticide active ingredient are specifically excluded from regulation per 40 CFR 455.20(c) and EPA guidance documents. The production of intermediates contributes approximately 0.768377 MGD of wastewater to the facility's wastewater treatment plant.

The previous permit used the building block method to calculate permit limits for the above parameters, however, the ELGs are written with the limitations in micrograms per liter (µg/L). However, as paraphrased, 40 CFR 122.45(f)(1)(ii) indicates effluent limitations in permits should match the units of measurements found in applicable standards. Therefore, providing effluent limitations in pounds per day using building blocks for this part of the permit should not have been performed.

Dibromochloromethane was sampled by the Environmental Services Program (ESP) of the department; the ESP took grab sample on 6/10/2015 and reported 30.2 µg/L for this volatile parameter; in a sample taken by the facility on 1/21/2016 using a composite sampling device, the facility reported no detection of this parameter with a reporting limit of 5 µg/L. Bromoform was sampled by the ESP on the same date as above reporting a value of 121 µg/L, and the facility reported non-detect. While the effluents may have been significantly different during those sampling events, the permit writer has used this example to provide two valuable points. 1) the facility must use grab sampling techniques to sample for volatile parameters. And 2), see next paragraph.

The previous permit allowed once/permit sampling and reporting. However, 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." The monitoring and reporting frequency has been increased to annually to comply with the rule and provide a sampling minimum for what may be varying effluents at the facility. The facility may sample any parameter more frequently if desired.

To comply with the Clean Water Act as promulgated through 40 CFR 122.44(d), and the department's permit writer's manual section 5.4.6 http://dnr.mo.gov/env/wpp/permits/manual/docs/5_4_6.pdf all technology based limitations must be compared to any available water quality limitations and then the most stringent limitation must be applied in the permit. In Table #001-B above, water quality limitations are supplied for comparison. HHF, human health protection from fish consumption is predominately used. The limits shown in the table above are provided mixing considerations therefore were calculated by using the following equation. A copy of the spreadsheet is available upon request.

HHF Chronic Limit "X"

Chronic WLA: $C_e = ((DF + MZ_{30Q10/4}) * X) \div DF = Y$

DF = 2.78 MGD = 4.3 cfs

$MZ_{30Q10/4}$ = 4818 cfs

LTA_c = Y = monthly average [CV = 0.6, 99th Percentile]

MDL = Y * (3.11/1.55) = Daily Maximum in µg/L [CV = 0.6, 99th Percentile]

In all cases, the technology-based limitations are more protective; see Part III, RPA. Similarly, the section following below show metals limits derivation. Several of the parameters addressed in the table above are reiterated below to include permit writer's narrative.

Table 4 to part 455 —Pesticide Chemicals

40 CFR 455 Table 4 BAT Pollutant	ELG Daily Max µg/L	ELG AML µg/L	Previous Permit Limits in lb/day ¥ MDL	Previous Permit Limits in lb/day ¥ AML	MDL ELG Daily Max in lbs/day	AML ELG Daily Max in lbs/day	Parameter Type	Reported Value µg/L
1,1-Dichloroethylene	25	16	0.63	0.4	0.58	0.37	V	ND (<5)
1,1,1-Trichloroethane	54	21	1.35	0.53	1.25	0.49	V	ND (<5)
1,2-Dichloroethane	211	68	1.11	0.36	4.89	1.58	V	ND (<5)
1,2-Dichloropropane	230	153	5.75	3.83	5.33	3.55	V	ND (<5)
1,2-Dichlorobenzene	163	77	4.08	1.93	3.78	1.79	BN	ND (<10)
1,2-trans-Dichloroethylene	54	21	1.35	0.53	1.25	0.49	V	ND (<5)
1,3-Dichloropropene {aka} 1,3-Dichloropropylene	44	29	1.1	0.73	1.02	0.67	V	ND (<5)
1,4-Dichlorobenzene	28	15	0.7	0.38	0.65	0.35	BN	ND (<10)
2-Chlorophenol	98	31	2.45	0.78	2.27	0.72	AE	ND (<10)
2,4-Dichlorophenol	112	39	2.8	0.98	2.60	0.90	AE	ND (<10)
2,4-Dimethylphenol	36	18	0.9	0.45	0.83	0.42	AE	ND (<10)
Benzene	136	37	3.4	0.93	3.15	0.86	V	ND (<5)
Bromodichloromethane {aka} Dichlorobromomethane	380	142	0.38 mg/L	0.142 mg/L	8.81	3.29	V	ND (<5)
Bromomethane {aka} Methyl Bromide	380	142	0.38 mg/L	0.142 mg/L	8.81	3.29	V	ND (<5)
Chlorobenzene	28	15	0.7	0.38	0.65	0.35	V	ND (<5)
Chloromethane {aka} Methyl Chloride	190	86	4.75	2.15	4.41	1.99	V	ND (<5)
Cyanide (Total)	640	220	23.02	8.01	14.84	5.10	O (V)	9.1
Dibromochloromethane {aka} Chlorodibromomethane	794	196	0.794 mg/L	0.196 mg/L	18.41	4.54	V	ND (<5)
Dichloromethane {aka} Methylene Chloride	89	40	2.23	1	2.06	0.93	V	48
Ethylbenzene	108	32	2.7	0.8	2.50	0.74	V	ND (<5)
Lead (Total)	690	320	17.26	8.01	16.00	7.42	M	ND (<10)
Naphthalene	59	22	1.48	0.55	1.37	0.51	BN	ND (<5)
Phenol	26	15	0.65	0.38	0.60	0.35	O (V)	32.2 [1]
Tetrachloroethylene	56	22	1.4	0.55	1.30	0.51	V	ND (<5)
Tetrachloromethane {aka} Carbon Tetrachloride	38	18	0.95	0.45	0.88	0.42	V	ND (<5)
Toluene	80	26	2	0.65	1.85	0.60	V	ND (<5)
Tribromomethane {aka} Bromoform	794	196	0.794 mg/L	0.196 mg/L	18.41	4.54	V	ND (<5)
Trichloromethane {aka} Chloroform (without BPJ allowances)	46	21	1.15	0.53	1.07	0.49	V	3230 max; 1390 avg [3]

Notes

- the names listed first are more common or appear within the rule in that format; common synonyms are listed second
- calculations for water quality standards for HHF were completed based on the value found on Table A of 10 CSR 20-7.031
- pounds per day calculations were based on a flow of 2.78 MGD which is the part of the facility's total discharge which the ELG's apply; the ELG limits were converted from ppb to ppm by diving by 1000; then multiplied by 2.78 MGD, then multiplied by 8.34 (the standard weight of a liquid)
- 40 CFR 414 Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) BAT & NSPS – Toxic pollutant effluent limitations and standards for direct discharge point sources that use end-of-pipe biological treatment; the facility is not subject to this part of the ELG; requirements removed.
- Limitations in bold are the limits applied to the facility
- The 30Q10 value was used to determine approximate water quality limitations and reasonable potential for HHF parameters as the 30Q10 approximates the harmonic mean
- None of the parameters in the table have water quality reasonable potential. See RPA.

* priority pollutant
¥ unless otherwise specified
Ϫ not found in 414.91(b)
ND not detected
< less than

(##)	analytical method reporting limit
[##]	number of analyses if detected
V	volatile parameter
AE	acid extractable parameter
BN	base neutral parameter
M	metal
O	other
β	calculation shown below
{aka}	also known as
AQL	protection of aquatic life
HHF	Human Health Protection – Fish Consumption

Chloroform

Monitoring for chloroform [$CHCl_3$] was minimum once per permit cycle in the previous permit. The facility reported 3.23 mg/L (3,230 µg/L) maximum; 1.39 mg/L (1,390 µg/L) average with 17 samples taken. Missouri's water quality standards are 470 µg/L for protection of HHF. Chloroform is found on the ELG at 40 CFR 455 on Table 4 (as trichloromethane). The permittee has requested additional BPJ allowances for the calculation of the permit limit.

Water quality limitations of chloroform were calculated and there is no WQ RP per RPA for this parameter. Technology limitations for this parameter are: 46 µg/L daily maximum; 21 µg/L monthly average. Previous limits were 1.15 pounds per day daily maximum and 0.53 pounds per day monthly average. The permittee has submitted a building block method of permit limit derivation as the current technology limit is unattainable.

Allowance for pollution control equipment. The permit writer has reviewed the formation and causes of chloroform in the wastewater, and believes this other source indicates the necessity to increase permit limitations based on the development document for 40 CFR 455. The permit writer believes the permittee has fulfilled the reporting obligations set forth in 40 CFR 122.21(k)(5). See application materials, *Background Information in Support of Wastewater Permit Renewal Application*; 12/16/2016; section 4.8 and attachment C. Permittee submitted data for:
Average = 192.61 lbs/day of sodium hypochlorite in the process sewer influent to the WWTP
WWTP removal efficiency = 75% (25% remains)
To determine the MDL, the AML is multiplied by the ratio of 3.11/1.55 [2.01]

The facility requested an intake credit from the city water's use. The permit writer has determined an intake credit is not applicable to this facility's discharge. The rule at 40 CFR 122.45(g) specifically and narrowly applies to dischargers only when the intake water is drawn from the same body of water. The water used, as stated above, is from the city of Kansas City drinking water treatment plant whereas the discharge is to the Missouri River; two absolutely separate water sources. Once the permittee uses the water in the processes, they assume any burden of what is in that water and must meet water-quality and/or technology limitations to discharge that water to waters of the state. Regardless, the permit writer has concluded this source adds a negligible amount to the final calculations and is not required to meet permitted limits per 40 CFR 122.45(g)(4) therefore cannot be applied.

The permittee requested once per permit cycle monitoring of this parameter. The permittee reported a maximum daily value of 3.23 mg/L and 39 pounds per day. The permit writer believes the effluent is highly variable based on the narrative provided by the permittee. The permit writer has determined chloroform is a parameter of moderate concern therefore weekly monitoring and monthly reporting are required for chloroform. This parameter must be collected as a grab sample due to volatility.

During the September pre-public notice comment period, the permittee requested monthly sampling. The permit writer reviewed the data submitted by the permittee, and because water quality is not affected by this parameter due to the generous mixing areas performed by the multiport diffuser, monthly monitoring is granted.

CHLOROFORM	PERMITTEE'S VALUE	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
455 Table 4 to calculate a pounds per day from MGD and ppm (base ELG)	2.78	0.046	0.021	8.34	1.0665192	0.48688
BPJ for pollution control in lbs/day	192.61	2.01 multiplier	25% removal efficiency	BPJ TSD	96.786525	48.1525
SUM					**97.9**	**48.6**

Cyanide, Total
40 CFR 455 indicates 640 µg/L daily maximum and 220 µg/L monthly average. The Environmental Services program sampled this parameter 6/10/2015 and analyzed using Lachat method 10-204-00-1-X and obtained 21 µg/L; on 3/17/2016 obtained 20 µg/L. The permittee reported 9.1 µg/L and 14 µg/L for permit renewal. Cyanide is a parameter which must be collected as a grab sample. There are no water quality limitations for total cyanide.

40 CFR 455.20(e) states: "In the case of lead and total cyanide, the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the applicable tables in this subpart times the flow from non-complexed lead-bearing waste streams for lead and times the flow from non-complexed cyanide-bearing waste streams for total cyanide. Discharges of cyanide in cyanide-bearing waste streams are not subject to the cyanide limitation and standards of this subpart if the permit writer or control authority determines that the cyanide limitations and standards are not achievable due to elevated levels of non-amenable cyanide (*i.e.*, cyanide that is not oxidized by chlorine treatment) that result from the unavoidable complexing of cyanide at the process source of the cyanide-bearing waste stream and establishes an alternative total cyanide or amenable cyanide limitation that reflects the best available technology economically achievable. The determination must be based upon a review of relevant engineering, production, and sampling and analysis information, including measurements of both total and amenable cyanide in the waste stream. An analysis of the extent of complexing in the waste stream, based on the foregoing information, and its impact on cyanide treatability shall be set forth in writing and, for direct dischargers, be contained in the fact sheet required by 40 CFR 124.8."

The facility did not submit an analysis of the extent of complexing cyanide in the waste stream. Through sampling, the permittee has demonstrated they are able to meet the cyanide ELG limitations as provided therefore additional TBEL allowances are not warranted.

Cyanide Amenable to Chlorination (CATC)
This parameter has Protection of Aquatic Life CCC = 5 µg/L, CMC = 22 µg/L standards. The facility reported not detected on the application for permit renewal. The facility does not have reasonable potential per RPA for this parameter. Monitoring discontinued. The facility has demonstrated they are not subject to the ELG for amenable cyanide as shown for Total Cyanide.

§414.91 –Toxic pollutant effluent limitations and standards for direct discharge point sources that use end-of-pipe biological treatment.
The previous permit required the facility determined what, if any, pollutants were present in the discharge based upon the list found in 40 CFR 414.91. However, the facility believes they are not subject to this ELG therefore the facility is not required to sample for all pollutants in this ELG. The following pollutants were identified as pollutants detected in the effluent.

§414 POLLUTANTS

Copper, Total Recoverable
See parameter under "METALS" below.

Fluorene
Water quality limitations for this parameter are HHF 14,000 µg/L. This parameter is a base/neutral compound. The facility reported 5.84 µg/L for this pollutant. No WQ RP per RPA therefore technology based limits are appropriate. See table below.

Nickel, Total Recoverable
See parameter under "METALS" below.

2-Nitrophenol
There are no water quality limitations for this parameter. See table below.

Zinc, Total Recoverable
See parameter under "METALS" below.

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). General warm-water habitat criteria apply (WWH) designated as AQL in 10 CSR 20-7.031 Table A. 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.

When ambient site specific hardness data is not available, standard water hardness of 162 mg/L is used in the conversion below. This value represents the 25th percentile of all watershed's in-stream hardness values throughout Missouri. Additionally, when there are no site specific translator studies, partitioning between the dissolved and absorbed phases is assumed minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the department, the department may integrate those findings into derivation of the water quality limits. Conversion factors for Cd and Pb are hardness dependent. N/A means not applicable.

METAL	CONVERSION FACTORS USING HARDNESS OF 162 MG/L	
	ACUTE	CHRONIC
Copper	0.960	0.960
Iron	N/A	N/A
Lead	0.721	0.721
Nickel	0.998	0.997
Zinc	0.978	0.986

Copper, Total Recoverable
There is no applicable technology-based limitation for this parameter; there is no current WQ RP per RPA for this parameter. The facility reported 142 µg/L maximum and 73.5 µg/L average for this parameter.

Iron, Total Recoverable
The facility reported 11.0 mg/L (11,000 µg/L) in the application for permit renewal. There is no applicable technology-based limitation for this parameter; there is no WQ RP per RPA for this parameter and future WQ is likely to not be affected. No additional monitoring required.

Lead, Total Recoverable
The permit writer is required to evaluate both technology and water quality limitations and use the most stringent limitation when applying permit limits per 40 CFR 122.44(d). The technology based limitation is **690 µg/L** daily maximum and **320 µg/L** monthly average. The previous permit's limits were 17.26 pounds per day maximum daily discharge, and 8.01 pounds per day monthly average. The permittee reported non-detections for this parameter. There is no WQ RP per RPA for this parameter. According to the calculations, the facility shall be held to the technology based limitations as they are more stringent. Lead is the only metal in the 40 CFR 455 ELG; see narrative regarding non-complexing metals under Total Cyanide. As the permittee did not provide specific wastestream values for this parameter, the permit writer had determined keeping the lead limitation as supplied in the ELG be most applicable to the discharge.

Nickel, Total Recoverable
The facility reported 23.2 µg/L in the permit renewal. There is no WQ RP per RPA for this parameter as the values reported are far below the calculated limits; the facility has determined this parameter is a pollutant of concern as listed in table 40 CFR 414.91(b) although they are not subject to this section. See table below.

Zinc, Total Recoverable
Zinc was identified as a pollutant of concern from 40 CFR 414.91(b). The facility reported 37.9 µg/L and 0.5 pounds per day maximum, and 0.5 pounds per day and 37.6 µg/L average with two samples taken. There is no WQ RP per RPA for this parameter. See table below.

§414.91 Table of Technology-Based Limitations based on BPJ and identified as Pollutants of Concern

414.91	ELG Daily Allowance	ELG Monthly Allowance	Flow	Multiplier	Pounds Conversion	Daily Maximum in lbs/day	Monthly Average in lbs/day	Reported Maximum in lbs/day
Copper	3,380	1,450	2.78	0.001	8.34	78.4	33.6	1.7
Fluorene	59	22	2.78	0.001	8.34	1.4	0.5	0.08
Nickel	3,980	1,450	2.78	0.001	8.34	92.3	33.6	0.3
2-Nirtrophenol	69	41	2.78	0.001	8.34	1.6	1.0	0.08
Zinc	2,610	1,050	2.78	0.001	8.34	60.5	24.3	0.05

The facility believes they are not subject to this ELG therefore no additional sampling required. The calculated permit limits are significantly different than the previous permit limits. The permit writer has reviewed the sections and determined these pollutants do not require additional scrutiny.

NUTRIENTS

Ammonia, Total as Nitrogen

Early life stages present, salmonids absent; total ammonia nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]; pH default of 7.8 SU. USGS Parameter code for ammonia as N (unfiltered) is 00610. USGS #06818000 for the Missouri River at St. Joseph, MO reported this parameter from 11/19/1969 through 9/10/1997. The average of the values was 0.14 mg/L. A spreadsheet of the reported values is available upon request. The permittee supplied discharge data to the department through discharge monitoring reports. The data from March 2012 through February 2017 was available for use. The calculations for ammonia discharges are based on the 1Q10 and 30Q10 data from the Missouri River but the CORMIX2 model did not evaluate those flows. However, the department has reviewed the data submitted by the facility and determined that even though the CORMIX2 model did not delineate the 1Q10 or 30Q10 values, the permittee does not likely have reasonable potential, per permit writers best professional judgment through logical observances, to contribute to in-stream ammonia exceedances in the river.

During the pre-public notice comment period in September, the permittee noted the frequency of sampling was overly stringent and requested removal of the parameter (for reasons not listed here; see comment response letter for comment period 9/13/2017 to 9/28/2017). Weekly monitoring reduced to monthly as there is no statistical RPA to provide WQ RP.

Nitrogen, Total N (TN)

Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD. The permittee reported this parameter present in the facility's discharge.

Phosphorous, Total P (TP)

Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD. The permittee reported this parameter present in the facility's discharge.

OTHER

The facility reported the following parameters may be present in the discharge on Form C, Part 3.00 C. and divulged these parameters may be present in up to double the reported values. However, because these parameters are not required by ELG, only those which have a water quality limitations or probable water quality issues will be considered for further sampling.

PARAMETER NAME	SOURCE	POLLUTANT QUANTITY	CONCLUSION	FREQUENCY	DISCUSSION
Captan	formulation	no data available	no WQ standard	n/a	no additional sampling required *
Carbaryl	formulation	avg. concentration: 0.00 ppm; avg. mass: 0.01 lbs/day	no additional sampling required	n/a	facility reported this parameter present is miniscule amounts; with the enormous mixing zone afforded by the diffuser, this parameter is not of concern *
Carbon disulfide	raw material	no data available	no WQ standard, easily volatile	n/a	no additional sampling required *
Coumaphos	formulation	avg. concentration: 0.00 ppm; avg. mass: 0.00 lbs/day	no additional sampling required	n/a	facility reported this parameter present is miniscule amounts; with the enormous mixing zone afforded by the diffuser, this parameter is not of concern
Dichlorvos	formulation	no data available	no WQ standard	n/a	no additional sampling required *
Formaldehyde	raw material	no data available	no WQ standard	n/a	no additional sampling required *
Xylene	solvent	non detection	no additional sampling required	n/a	facility reported this parameter was not detected; with the enormous mixing zone afforded by the diffuser, this parameter is not of concern
Triethylamine	formulation	no data available	no WQ standard	n/a	no additional sampling required *

* The permit writer has considered this pollutant as possibly present in the discharge of the facility. However, due to the sophisticated wastewater treatment system in place at this facility, the permit writer has determined since similar pollutants are controlled using this method and Whole Effluent Toxicity limitations are in place in this permit, specific effluent limitations are not required for this parameter.

OTHER

Chlorides
The facility is subject to sulfate monitoring therefore must also monitor for chlorides; see below. Quarterly monitoring required.

Sulfates
The facility reported 755 mg/L for this parameter with a discharge of 11,100 pounds per day. To evaluate reasonable potential to cause or contribute to instream exceedances of this parameter, the facility will monitor quarterly.

Chlorides plus Sulfates
The facility will report the sum of sulfates plus chlorides. Quarterly monitoring required.

BIOMONITORING

Biomonitoring: Whole Effluent Toxicity (WET) Testing

Whole Effluent Toxicity (WET) testing is the use of representative, standardized organisms to assess instream toxic impacts from dischargers. There are two basic types of WET tests: acute and chronic. The 48-hour acute test measures toxicity where death of the test organisms is the measured endpoint. The 7-day chronic test measures reduction in growth or reproduction of test organisms.

WET tests use standardized lab organisms from two trophic levels to represent species found in the natural environment. The fathead minnow (*Pimephales promelas*), a fish commonly found throughout North America, is used to represent vertebrate species. A commonly found water flea (*Ceriodaphnia dubia)* is used to represent aquatic invertebrates that serve as an important link in the food chain. Assessment of overall toxicity is based on the toxicity results for both species as sensitivity is measured synergistically and certain contaminants are more toxic to vertebrates over invertebrates and conversely.

Both acute and chronic tests are conducted in similar ways. In the tests, effluent is diluted into test chambers in a series from 100% effluent to more dilute samples. The dilution series is designed to "bracket" the observed type of toxicity. For instance, in an acute test, the dilution series would need to include dilutions where there is observable toxicity and more dilute samples where there is no observed mortality. (Note: Not all samples can be bracketed. Higher levels of toxicity are usually found with industrial discharges or cities with large industrial users.)

The LC_{50} is calculated differently depending on the characteristics of test data. They are the graphical, probit, Spearman-Karber, and trimmed Spearman-Karber methods. The inhibition concentration (IC) is the statistical analysis used in chronic WET tests to estimate the sub-lethal effects of an effluent sample. An IC_{25} is an estimate of the concentration of effluent that causes a 25% reduction in a nonlethal endpoint, such as reproduction or growth, in a given time period (usually 7 days). An IC_{50} is an estimate of the effluent concentration that would cause a 50% reduction. The IC is compared to the instream waste concentration (IWC) for the effluent to determine whether there is potential for the effluent to cause sub-lethal effects to aquatic populations, once it has mixed with the receiving water. If the IC value is lower than the IWC, the effluent has the potential to cause chronic impacts in the receiving water. An in-depth discussion on the appropriate use of each statistical package is given in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.*

PREVIOUS PERMIT WET DERIVATION
The previous permit's calculated Acute WET Limit = 0.3 TUa x 446 = 133.8 TUa (not limited in previous permit)
The previous permit's calculated Chronic WET Limit = 1.0 TUc x 531 = 531 TUc (limit in previous permit)

CURRENT PERMIT WET DERIVATION
The permittee has shown through previous sampling the discharge does not have RP to cause toxicity to the receiving stream. The facility requested once per permit cycle monitoring, however, because this facility changes operations frequently, the permit writer has determined annual sampling is required.

Chronic WET test
The dilution ratio (AEC) of the effluent at the edge of the MZ is 1/535 * (100%) = 0.19%

Implementation
The permittee shall be responsible for the organization of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in special sonditions of the NPDES discharge permit in accordance with the appropriate test protocols described herein. Daphnid (*Ceriodaphnia dubia*) Survival and Reproduction Test and Fathead Minnow (*Pimephales promelas*) Larval Growth and Survival Test. Chronic toxicity data shall be reported as outlined in the permit special conditions.

To classify the effluent, the dilution series (DS) must be able to detect toxicity, which means the upper bounds of the DS should be high enough to have statistically meaningful mortalities or growth inhibitions. 10 CSR 20-7.015((9)(L)4.A. states the dilution series must be proportional. While typically the effluent dilution series contain the AEC, it is possible to calculate the TU of the effluent when the AEC is not included within the DS as long as the AEC has been bracketed by the DS. The permit writer has used best professional judgment to redirect the DS, using an expanded DS, but still bracketing the chronic AEC. If no mortalities or reduced reproduction is observed, the true LC_{50} or IC_{25} cannot be computed. Once computed, the permit writer will be able to effectively calculate the CV, minimum, maximum, and reasonable potential of the discharge to cause or contribute to toxicity in the receiving waterbody.

The minimum dilution is set at 0.15%, a multiplier of 2.0 was used.

The dilution series shall be: 0.15%, 0.30%, 0.60%, 1.2%, and 2.4%

By use of this expanded dilution series, the permit writer hopes to capture useful data to further elucidate reasonable potential at the next permit renewal. The facility's current data show there is no RP for whole effluent toxicity. Limits removed, monitoring continued.

INTERNAL MONITORING OUTFALL #002 – THERMAL OXIDIZER – VOLUNTARY MONITORING
The facility requested this outfall be listed in the permit though no regulatory requirements exist.

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	*	SAME	ONCE/MONTH	ONCE/MONTH	24 HR. EST
CONVENTIONAL							
CHEMICAL OXYGEN DEMAND	mg/L	*	*	NEW	ONCE/MONTH	ONCE/MONTH	GRAB
CHEMICAL OXYGEN DEMAND	lbs/day	*	*	SAME	ONCE/MONTH	ONCE/MONTH	GRAB
PH ǂ	SU	*	-	SAME	ONCE/MONTH	ONCE/MONTH	GRAB
TOTAL SUSPENDED SOLIDS	mg/L	*	*	NEW	ONCE/MONTH	ONCE/MONTH	GRAB
TOTAL SUSPENDED SOLIDS	lbs/day	*	*	SAME	ONCE/MONTH	ONCE/MONTH	GRAB

* monitoring requirement only
ǂ the facility will report the minimum and maximum pH values; pH is not to be averaged
NEW Parameter not previously established in previous state operating permit

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
The facility has requested to monitor this parameter weekly. The facility will then report monthly. The facility may estimate the flow. Days of zero discharge should not be averaged into the monthly average.

CONVENTIONAL:

Chemical Oxygen Demand (COD)
The facility has requested this parameter remain in the permit. The facility will monitor monthly. The previous permit required reporting in pounds per day; the permit writer has chosen to ask the facility to also report in mg/L.

pH
This outfall does not discharge to waters of the state therefore no limitations apply. The facility has requested to report this parameter to the department monthly. The facility will report the minimum and maximum values.

Total Suspended Solids (TSS)
The facility has requested this parameter remain in the permit. The facility will monitor monthly. The previous permit required reporting in pounds per day; the permit writer has chosen to ask the facility to also report in mg/L.

OUTFALLS #003 & #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	UNSCHEDULED ϕ	UNSCHEDULED ϕ	24 HR. EST.
CONVENTIONAL							
BOD_5	mg/L	**	45	SAME	UNSCHEDULED ϕ	UNSCHEDULED ϕ	GRAB
CHEMICAL OXY DEMAND	mg/L	**	90	SAME	UNSCHEDULED ϕ	UNSCHEDULED ϕ	GRAB
OIL & GREASE	mg/L	**	10	SAME	UNSCHEDULED ϕ	UNSCHEDULED ϕ	GRAB
PH ǂ	SU	**	6.0 TO 9.0	SAME	UNSCHEDULED ϕ	UNSCHEDULED ϕ	GRAB
SETTLEABLE SOLIDS	mL/L/hr	**	2.5	SAME	UNSCHEDULED ϕ	UNSCHEDULED ϕ	GRAB
TOTAL SUSPENDED SOLIDS	mg/L	**	100	SAME	UNSCHEDULED ϕ	UNSCHEDULED ϕ	GRAB

* monitoring requirement only
** monitoring with associated benchmark
ǂ the facility will report the minimum and maximum pH values; pH is not to be averaged
NEW parameter not established in previous operating permit
ϕ Unscheduled benchmark monitoring for outfalls #003 and #004: The facility shall monitor when outfalls #003 and #004 are discharging; however, sampling daily upon discharge is not required as this is for the purpose of stormwater benchmark monitoring. The facility is not required to monitor (or to divert discharge to obtain a sample), however quarterly monitoring is recommended (if discharging) to evaluate BMPs. Reduced sampling frequency for stormwater is allowed per 40 CFR 122.44(i)(4).

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).

Precipitation
Measuring the amount of precipitation [(10 CSR 20-6.200(2)(C)1.E(VI)] during an event is necessary to ensure adequate stormwater management exists at the site. Knowing the amount of potential stormwater runoff can provide the permittee a better understanding of specific control measure that should be employed to ensure protection of water quality. The facility should record the 24 hour accumulation value of precipitation to evaluate effectiveness of BMPs. Precipitation values are not required to be reported to the department however SWPPP requirements may differ.

CONVENTIONAL:

Biochemical Oxygen Demand (BOD_5)
Monitoring is included using the permit writer's best professional judgment. There is no water quality standard for BOD_5; however, increased oxygen demand may impact instream water quality. BOD_5 is also a valuable indicator parameter. BOD_5 monitoring allows the permittee to identify increases in BOD_5 that may indicate materials/chemicals coming into contact with stormwater that cause an increase in oxygen demand. Increases in BOD_5 may indicate a need for maintenance or improvement of BMPs. Additionally, a benchmark value will be implemented for this parameter. The benchmark value will be set at 45 mg/L. Benchmark continued from previous permit.

Chemical Oxygen Demand (COD)
Monitoring is included using the permit writer's best professional judgment. There is no water quality standard for COD; however, increased oxygen demand may impact instream water quality. COD is also a valuable indicator parameter. COD monitoring allows the permittee to identify increases in COD that may indicate materials/chemicals coming into contact with stormwater that cause an increase in oxygen demand. Increases in COD may indicate a need for maintenance or improvement of BMPs. Additionally, a benchmark value will be implemented for this parameter. The benchmark value will be set at 90 mg/L. This value falls within the range of values implemented in other permits that have similar industrial activities. Benchmark continued from previous permit.

Oil & Grease
Monitoring, with a daily maximum benchmark of 10 mg/L. This is a technology based benchmark continued from the previous permit. It is in the professional judgment of the permit writer to require monitoring of this pollutant with a benchmark that represents a technology based standard found to be achievable in other industrial permits.

pH
6.0 to 9.0 SU, technology-based limitations used as the benchmark for the stormwater outfalls.

Settleable Solids (SS)
Monitoring, with a daily maximum benchmark set at 2.5 mL/L/hr; continued from previous permit. There is no water quality standard for SS; however, sediment discharges can negatively impact aquatic life. Increased settleable solids are known to interfere with multiple stages of the life cycle in many benthic organisms. For example, they can smother eggs and young or clog the crevasses that benthic organisms use for habitat. Settleable solids are also a valuable indicator parameter. Solids monitoring allows the permittee to identify increases in sediment and solids that may indicate uncontrolled materials leaving the site.

Total Suspended Solids (TSS)
There is no 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 that may indicate 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. A benchmark value will be implemented for this parameter. The benchmark value will be set at 100 mg/L continued from previous permit. This value is achievable through proper operational and maintenance of BMPs; the facility did not exceed this benchmark in the previous permit cycle.

INTERNAL MONITORING OUTFALL #005 – FENTON OXIDIZING PLANT – VOLUNTARY MONITORING
The facility requested this outfall be listed in the permit though no regulatory requirements exist.

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	*	NEW	≈	≈	24 HR. EST
OTHER							
BACTERIA, TOTAL‡	#/100mL	¥	*	NEW	≈	≈	GRAB

* Monitoring requirement only
‡ # of colonies/100mL; the Monthly Average for total bacteria is a geometric mean.
¥ monitoring with target value of 2.1 x10^8 cfu/100 mL
NEW outfall is newly established
≈ the facility requested to sample monthly for the first year then quarterly thereafter; all reports will be submitted at-will of the permittee; the limitations for this permit are not governed by any NPDES permitting requirement.

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
The facility shall measure flow at this outfall following the same schedule provided in the application for total bacteria.

OTHER:

Bacteria, Total
In the application for permit renewal, the facility described the necessity for additional monitoring at an internal monitoring point, henceforth labeled as outfall #005. The facility proposed limitations of total bacteria at 1 x 10^8 cfu/100 mL as a monthly average (geometric mean), and by multiplying by 2.1 (per TSD [EPA/505/2-90-001] Table 3.2; CV = 0.6; n=6), obtain a daily maximum of 2.1 x 10^8. The facility may select whatever multiplier they desire for this outfall as this is not a regulated wastestream. The facility plans to sample monthly the first year, and quarterly thereafter. Currently, no ELG requirements are established by the EPA, the facility has proposed these effluent limitations in a proactive manner thereby showing compliance in advance of any limitations being established in rule although the permit writer can find no legal justification for requiring monitoring of this outfall.

During the pre-public notice review process in September 2017, the permittee noted the analytical method as described within the original application materials may not be possible to achieve in the short term. The permit writer has changed the outfall to "at-will" reporting. The method for analysis will be determined by the facility on an ad-hoc basis.

During the pre-public notice review process in October 2017, the permittee noted they preferred to not have a limit for total bacteria. The limit of 2.1 x 10^8 cfu/100 mL was removed. The permittee requested a benchmark however benchmarks are only for stormwater therefore the permit writer implemented monitoring only.

In the preview period encompassing February 2018, a technology target value (indicated by ¥) of 2.1 x 108 cfu/100 mL was added at the request of the permittee. Targets are neither limits nor benchmarks and may be established during Departmental negotiations; the targets listed here are not limits therefore not an enforceable part of the permit. While the facility stipulates this value will be protective of water quality, the permit writer has noted, this outfall is an internal outfall therefore is not subject to water quality limitations; this outfall discharges to the on-site treatment system, receives tertiary treatment, and then discharges to the Missouri River through outfall #001; water quality limitations are assessed at the outfall which discharges to waters of the state.

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.

Reporting pH: the facility is required to continuously sample the pH of the effluent. The permittee is to not discharge effluent below 6.0 or above 9.0 SU. However, because the facility is permitted to have minor excursions of this parameter, the eDMR system will not show limitations for pH. The limitations are still effective however compliance is determined based on the length of the excursions.

SAMPLING FREQUENCY JUSTIFICATION:
Sampling and reporting frequency was generally retained from previous permit. 40 CFR 122.45(d)(1) indicates all continuous discharges (not from POTWs) 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.

In accordance with Appendix U of Missouri's Water Pollution Control Permit Manual, new parameters shall require the permittee sample at a minimum twice per month; however, *E. coli* shall have weekly sampling as required per 10 CSR 20-7.015(9)(D)6. for flows greater than 100,000 gallons per day.

SAMPLING TYPE JUSTIFICATION:
The previous permit required sampling of a suite of parameters once per permit cycle. Within the table for sampling, a note required flow proportional composite sampling. However, many of these parameters are volatiles or semi-volatiles (see Part IV, outfall #001, table regarding 40 CFR 414.91/455 parameters). Parameters which may be subject to volatilization should not be collected using composite sampling methods and should be collected as grab samples due to the volatility of the compounds.

The sampling types indicated in this permit 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, *E. coli*, total residual chlorine, free available chlorine, hexavalent chromium, 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 CFR 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 not be synchronized at this time because of the complexity of the permit and at the request of the permittee.

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 4/20/2018 to 5/21/2018. Nineteen comments were received, which are located below and include the Department's responses along with additional clarifications.

1. Abbreviated Term of Permit (Fact Sheet, pg. 46):

   The version of the draft permit reviewed by the facility was obtained from MDNR's web site and did not contain a proposed effective date or expiration date. The draft permit's Fact Sheet however included a discussion of the permit's term on page 46 under topic heading "Permit Synchronization." The Fact Sheet discusses MDNR's goal to synchronization the expiration date of all permits in a watershed so that all the permits will be up for renewal in the same fiscal year. The discussion includes a link to a draft document on MDNR's web page entitled "Framework Description for Watershed Management in Missouri" dated November 5, 2012.

   Renewal of the facility's MSOP takes a tremendous about of time and resources. A five year permit term also provides the facility a certain amount of regulatory certainty that helps the facility plan operating, maintenance, and upgrades to its wastewater treatment equipment. While the facility is not opposed to the concept of synchronizing the expiration date of the facility's permit, the facility is concerned on the actual likelihood that the watershed project will occur. One reason for skepticism in the watershed project's future is that the document cited in the Fact Sheet to justify the facility's additional expenditure of time and resources is to a draft document that was last revised over 5½ years ago.

   The Fact Sheet of the draft permit indicates that the MDNR intends to issue the renewed permit for a term of less than 5 years with an anticipated expiration date of 1st quarter of 2021 (about 2½ years from now if the facility's renewed permit is issued by July 1, 2018). Then, the Fact Sheet states that the next permit renewal would be issued with an anticipated expiration date of 2nd quarter 2024 (about 3 years). Bayer believes that this is unreasonable and burdensome. Section 644.051.10 RSMo indicates that an operating permit shall be issued for a term of up to 5 years which implies that the MDNR has the authority to shorten the permit term for good cause. In this case, Bayer will be required to prepare a permit renewal application before the 3rd quarter of 2020 and another 6 months prior to the next MDNR project permit expiration date of 2nd quarter 2024. Due to the complexity of the Bayer facility, considerable resources have been spent to prepare a permit renewal application that provided all the information in a concise and efficient format that we believed the permit writer would need to issue the permit. To subject Bayer to this renewal process twice in the next 5 year period without a good cause is arbitrary and burdensome. Bayer does not believe that permit synchronization alone is a compelling reason or good cause to burden permittees.

   In order to resolve this issue, Bayer suggests an alternative less burdensome way to synchronize the expiration date of the facility's renewed permit with other permits in the watershed. The idea is to temporary delay issuance of the renewed permit currently being worked on by a few months until the 1st quarter of 2019. The 1st quarter of 2019 is only seven months from now. The slight delay would allow the renewed permit to be issued for a term of 5 years with a synchronized expiration date that would align with MDNR's target date for the watershed of 2nd quarter 2024.

   Response #1
   The permit writer has determined this permit does not require synchronization based on the complexity of the permit; the fact sheet was changed.

2. Prohibition of using Bacteria Mixing Zones (pg. 4 and 5, Table A-1 and A-2):

The draft permit requires *E. coli* monitoring at Outfall #001 and adherence with water quality criteria in 10 CSR 20-7 Table A with permit limits expressed as a daily maximum of 1,030 MPN/100 ml and monthly average of 206 MPN/100 ml at end-of-pipe following a 1-year compliance schedule. In previous permits, the facility was not subject to *E. coli* monitoring. Bayer proposes an alternative approach that considers site-specific mixing zones.

As explained in the below paragraphs, by using a holistic approach the facility respectfully believes that in this site-specific instance a mixing zone for *E. coli* is appropriate for the facility's discharge from Outfall #001:

a.) EPA allows biological mixing zones: Because the *E. coli* final effluent limitations appearing in the draft permit do not consider mixing zones, they are unnecessarily stringent for maintaining *E. coli* water quality criteria in the Missouri River at the discharge of the facility. Bayer's requested alternative approach is based, in part, on an Iowa lawsuit related to bacterial mixing zones. In The *Iowa League of Cities v. USEPA* slip op. No.11-3412 (8th Cir. March 25, 2013) decision a precedent for bacterial mixing zones was established that allows wastewater treatment plants to use mixing zones, or blended wastewater streams, for constructing and/or meeting bacterial permit limits in EPA Region 7. This ruling invalidated two EPA letters prohibiting mixing zones dated June 30, 2011 and September 14, 2011, as well as a EPA November 2008 memorandum justifying this prohibition. Given that Missouri is within USEPA Region 7, which now allows the use of bacterial mixing zones, the use of mixing zones could be used by the MDNR. Bayer requests that the MDNR consider bacterial mixing zones to assess the need for an *E. coli* final effluent limitation from Outfall #001, and, if necessary, use this alternative approach to establish an *E. coli* water quality based effluent limit (WQBEL). Since the facility has adequate mixing and dilution from Outfall #001 from the facility's diffuser at a ratio of 446:1, a WQBEL is a more reasonable approach for instituting a final effluent limitation for the facility.

In order to institute this approach, a reasonable potential analysis (RPA), as outlined in the Technical Support Document for Water-Quality Toxics-Based Control (USEPA, 1991), will need to be performed. The RPA will factor in the dilution available from the facility's diffuser and *E. coli* data collected from Outfall #001. In order to perform an RPA an adequate dataset is necessary, which is considered to be a *minimum* of 8 to 12 effluent samples. Therefore, there are insufficient data at this time to determine whether the facility's effluent will result in a reasonable potential to cause or contribute to an exceedance of *E. coli* water quality criteria. Bayer proposes to collect these data during the 1-year schedule of compliance, at which time a WQBEL can be calculated and daily maximum and monthly average permit limits developed for the remainder of the permit term.

b.) Mixing lowers human health risk: Bayer understands that the MDNR may find issue with the fact that mixing is allowed for the purpose of accounting for dilution, and although a mixing zone is incapable of diluting a single bacteria, a mixing zone serves the same purpose for bacteria as it does for other constituents. The EPA establishes bacteria water quality criteria based on human-health risk of illness and the concentration of colony forming units per volume. A bacterial mixing zone serves a similar purpose, which shows that mixing lowers the number of colony forming units per volume of water; thereby lowering the risk of contact and/or ingestion.

c.) Bayer's Outfall #001 allows for complete mixing: As the MDNR is aware, Bayer has installed a multi-port diffuser for Outfall #001. The diffuser operates such that enhanced, rapid, and uniform mixing is attainable. Use of Bayer's multi-port diffuser allows for more complete and rapid mixing than a traditional outfall, thus further limiting any potential risks associated with allowing a bacteria mixing zone.

d.) Location of Bayer's Outfall #001 does not allow for the WBC-B use prior to complete mixing: Bayer's Outfall #001 discharges on the bottom and near the middle of the Missouri River outside of the navigation channel. The first orifice of the diffuser is over 37 feet from the bank of the river. This configuration allows for ample mixing in the river prior to any potential for recreational contact with incomplete mixed effluent. It's also worth pointing out that the channel of the Missouri River is 25 feet deep (USGS gage 06893000 Missouri River at Kansas City, MO) at this location. As previously stated, Bayer's diffuser allows for ample mixing, thus mixing will occur prior to the potential for any whole body contact to occur.

Bayer understands that the intent of the WBC-B beneficial use and associated *E. coli* water quality criteria is to limit the risk of human contact with pathogenic bacteria. This intent can be achieved through the use of a mixing zone because of the facility's diffuser and its location. The water quality criteria applicable at end-of-pipe is overly protective for the facility's site-specific circumstances. Bayer requests that the MDNR allow the facility to use a mixing zone in order to determine compliance with the *E. coli* water quality criteria.

If the MDNR will not consider mixing zones and the development of a WQBEL following the 1-year schedule of compliance on the basis that MDNR does not believe the current rule has the flexibility to allow for mixing of bacterial parameters, Bayer requests that the MDNR consider rulemaking as part of the next Triennial Review to revise 10 CSR 20-7 Table A to allow for mixing.

Response #2
Missouri Water Quality Standards do not allow mixing considerations for *E. coli*; mixing is only allowed for toxic parameters and *E. coli* is not considered a toxic parameter. Given the instream standard does not account for bacteria mixing the permit will remain as proposed.

3. Description of Stormwater Discharge for Outfall #003 and Outfall #004 (pg. 3):

Abbreviated descriptions of Outfall #003 and Outfall #004 stormwater discharges are provided on page 3 of the draft permit in addition to information on each outfall's legal description, UTM coordinates, receiving stream, and two other details. A full description of the facility's stormwater and its management is included on several pages of the draft permit beginning on page 12 and the Fact Sheet beginning on page 22.

The purpose of this comment is to request that the short narrative description appearing on page 3 of the draft MSOP be slightly revised regarding the mention of steam condensate. The currently written text imposes a complete prohibition of any steam condensate discharging through the stormwater outfalls. Given the age and configuration of the facility, and the quantity of steam used, it will be impossible for the facility to comply with this prohibition because there will always be a possibility that steam vapor released from the system will contact rain or cold ambient air, condensate, and the condensate will fall to the ground where it may be discharged to the stormwater collection system and discharged via Outfall #003 and/or Outfall #004. To account for these infrequent and small events, Bayer requests that the draft text be slightly revised by adding the statement "(other than trace amounts)" be added in parentheticals in between the words "condensate" and "or" of the existing descriptions of each outfall. As revised, the text under Outfall #003 and Outfall #004 would read ". . . is not permitted to discharge steam condensate (other than trace amounts) or other process . . ."

Response #3
The permit was revised to allow for the discharge of steam condensate in trace amounts.

4. Schedule of Compliance to Comply with new *E. coli* Permit Limits (pg. 4):

Bayer appreciates the permit's inclusion of a 1-year schedule of compliance for *E. coli* limits on Outfall #001.

Response #4
No response required.

5. Inconsistent Expression of Reporting Units (pg. 4 and 5, Tables A-1 and A-2):

The facility requests that all effluent parameters identified in Table A-1 and Table A-2 of the draft permit require reporting in the same concentration units. Bayer is commenting on this issue for the purpose of decreasing data entry and processing errors for the laboratories, Bayer, the MDNR, and the public. As previously referenced by the MDNR, Bayer understands that Missouri Water Quality Standards lists certain parameters' criteria as either µg/L or mg/L; however, final effluent limitations are not water quality standards. In addition, 40 CFR Part 136, which specifies procedures to be used for NPDES permits, includes concentration units in mg/L if concentration units are used and does not specify reporting units. The facility is not aware of any other Missouri or Federal requirement that specifies the use of specific concentration units for reporting discharge monitoring report data.

Currently a majority (i.e., 9) of the effluent parameters require reporting in mg/L and three require reporting in µg/L. The alternating use of reporting units can cause data error and the facility seeks to eliminate unnecessary errors by them or other parties to the extent practicable. The facility requests that concentration units currently expressed in µg/L in Table A-1 and Table A-2 be changed to mg/L. The facility is only making this request for Table A-1 and A-2.

Response #5
While there are no state regulations requiring certain units, it is the Departments practice to keep the same units for pollutant parameters in permits as they are expressed the Missouri Water Quality Standards. The permit writer has reviewed past laboratory reports where pesticides and organics are typically reported in µg/L units. Since the permittee will be entering the data into the eDMR system, each piece of data will be entered individually. The permit writer has seen errors on numerous occasions when the laboratory report is in different units than the permit, unit conversions are where issues frequently arise. To reduce reporting errors, units should be representative of the water quality standards reduce as many transcription errors as possible. No changes were made to the permit in response to the comment.

6. Ammonia Monitoring Outfall #001 (pg. 4 and 5, Tables A-1 and A-2):

Bayer previously commented on a preliminary draft of the permit, in which we stated that the facility does not believe that there is reasonable potential to exceed the ammonia water quality criteria for Outfall #001. The MDNR disagreed with this assessment stating that the analysis provided failed to account for the 1Q10 and 30Q10 critical low flow conditions of the Missouri River. The MDNR also provided their calculations to support their position. Bayer's consultant has evaluated the MDNR's analysis and has discovered that the MDNR has defaulted to a zone of initial dilution flow (i.e., 1Q10) of 10 times the effluent flow as described in 10 CSR 20-7.031(5)(A)4.B.(III)(b). It is due to the usage of a 1Q10 flow of 43.4 cubic feet per second (cfs) in the reasonable potential analysis that the calculations show a potential to exceed the water quality criteria for ammonia. Clearly this is not the case as the CORMIX mixing study conducted in 2008 indicates a dilution ratio of 446 (ZID) and 535 (MZ) based upon a 7Q10 flows of 17,659 cfs. The MDNR in the response to comments on the preliminary draft and in the Fact Sheet of the permit indicates that calculations related to ammonia (non-7Q10 flows) will be calculated in accordance with the default mixing provided by the regulations (i.e., 10x effluent flow for the ZID).

Bayer is evaluating whether to re-run the CORMIX model to include updated flows that include 1Q10, 7Q10, and 30Q10 flow regimes. We would like to point out that our consultant, using the MDNR provided reasonable potential spreadsheet, calculated the reasonable potential using an adjusted flow of 10% of the ZID flow predicted by the 2008 COMIX model and determined that there is no reasonable potential to exceed for ammonia using only a ZID flow of 193 cfs. Bayer believes that this is a very conservative evaluation of the potential to exceed the ammonia water quality criteria and does not believe that there is any compelling reason, given the usage of the multiport diffuser on Outfall #001, to suggest that the ammonia contained in Bayer's discharge would cause or contribute to an exceedance of the state's water quality criteria for ammonia. Bayer requests that the MDNR reconsider their position on requiring ammonia monitoring.

Response #6
Monitoring for ammonia is being required to determine future reasonable potential based upon ammonia concentrations of the discharge during this permit term. At this time the past ammonia data indicates that the discharge does not currently have reasonable potential, for this reason the permit does not include an effluent limitation.

7. Reference to use Instantaneous Flow to Calculate Mass of Total Organic Pesticide Chemicals (pg. 10):

Special Condition D.1(a) of the draft permit states in part "The sampling results for each pesticide analyzed for shall be added together and converted from concentrations units to pounds using the instantaneous flow (in MGD) for the sample." Bayer would like to point out that the sample type is 24-hour composite, and the units required to be reported for TOP Chemicals in Tables A-1 and A-2 are lbs/day. In order to convert the concentration units to lbs/day, the facility needs to use the 24-hour total flow during the collection period rather than an instantaneous flow measurement. The facility requests that this permit condition be changed to read "The sampling results for each pesticide analyzed for shall be added together and converted from concentrations units to pounds using the 24-hour total flow (in MGD) for the sample."

Response #7
The permit was modified to the requested language.

8. Minor Edits to Process Flow Diagram of Wastewater Treatment Plant (draft permit pg. 11 and Fact Sheet pg. 5):

The draft permit and Fact Sheet include a simplified process flow diagram of the facility's wastewater treatment plant. The purpose of this comment is to communicate to the MDNR several minor line color changes that needed to be made to the flow diagram. First, the line color was changed from black to blue for flow lines leading to and from the Emergency Tank and Equalization Tank 4.1-B11. Also, the word "(alternative)" in parentheticals was added next to the flow line leading to Equalization Tank 4.1-B11. In addition, an arrow point was added to an existing horizontal blue flow line that is located just above the Lag Clarifier. The flow line now as an arrow point at each end to signify wastewater flow can occur in both directions. Finally, additional minor line color changes from black to blue were made on the dotted RAS (return activate sludge) lines exiting the two Lag Clarifiers. Changing these lines to blue, adding the word alternative, and adding an arrow point improves the accuracy of the flow diagram.

No other minor or major changes have been made to the flow diagram. A color copy of the revised flow diagram is included in Attachment I of this letter. In addition, to improve the clarity and readability of the flow diagram, high resolution versions of the flow diagram in Adobe and MS PowerPoint file formats are being provided on a computer flash drive in Attachment VIII of this letter.

Response #8
The new flow diagram was included in the permit.

9. Request for Time to Setup Future Requirement for Facility to Submit Discharge Monitoring Reports Electronically using eDMR (pg. 12):

The purpose of this comment is to remind the MDNR that the facility is currently not using the electronic discharge monitoring report (eDMR) system. The facility submitted an application to set up eDMR in correspondence dated December 16, 2016, but as of the date of this letter have not heard back from the MDNR. The facility has not received an email confirmation from the MDNR nor temporary passwords or PINs for the facility's future users of eDMR system. The facility is bringing this fact to the MDNR's attention to ensure that when the renewed MSOP is issued, the MSOP will include sufficient time for the facility to work with the MDNR to set up the ability to submit eDMRs before the first eDMR is due.

Response #9
The Department approach is to process eDMR applications along with the permittee's renewal application and issuance of their permit when appropriate. The facility will be loaded into the eDMR system upon the permit's effective date. The Department is confident that the facility will have sufficient time to get set up in eDMR prior to the need to submit the first discharge monitoring reports.

10. Consequences of a Stormwater BMP Deficiency (pg. 12):

Special Condition D.6 of the draft permit states in part: "A deficiency of a BMP means it was not effective preventing pollution [10 CSR 20-2.010(56)] of waters of the state, . . ." This may be generally true at many other facilities; however, because of the geography and nature of operations of this facility, Bayer does not believe that this is an accurate statement for this site, and requests that the language be removed or changed. The first flush, and in most instances entire rainfall events, of stormwater at the facility drains to a self-contained and highly controlled central stormwater collection system, and then is treated in an on-site wastewater treatment plant. For this reason, a deficiency of an internal BMP at this facility would not result in pollution to waters of the state, except under very unusual circumstances.

If the identified deficiency of a BMP (best management practice) statement cannot be removed from the permit, Bayer suggests the following revision – "A deficiency of a BMP may cause it to be ineffective in preventing pollution of waters of the state."

Response #10
Changed as requested.

11. SWPPP Records Retention (pg. 13):

Special Condition D.7(b) of the draft permit requires that SWPPP inspection reports be maintained for a period of five (5) years. This duration is longer than Clean Water Act regulations at 40 CFR §122.41(j), and Standard Conditions Part I, Section A5., that allows for a three (3) year retention schedule. The facility does not see the need for an additional two years of records to be kept. As such, Bayer kindly requests that the five (5) year requirement be changed to three (3) years, or be removed from the draft permit.

Response #11
The records retention period was changed to three years.

12. Stormwater Inspection Frequency (pg. 13):

Bayer does not believe that a monthly stormwater inspection frequency is warranted. Currently, stormwater inspections are conducted on a quarterly basis, and there have been no changes in the facility operation or deficiency of BMPs that would suggest that an increase in inspection frequency is needed.

The BMPs at this facility are not temporary structures or practices that require frequent stormwater inspections to employ and maintain; such as bales of hay, silt fences, retention ponds, wetlands, porous media filtration such as sand/gravel, vegetation buffers, etc. Instead, the facility's stormwater BMPs are permanent structures such as buildings, roofed structures, concrete secondary containment structures, manmade enclosed conveyance piping systems, and advanced wastewater treatment plant to treat stormwater before discharge.

Bayer has invested millions of dollars to construct roofed, partially roofed, and totally enclosed bulk container unloading structures. A large portion of all bulk loading/unloading at the facility takes place at these structures which likely classify as no exposure structures. The roofs prevent all or most rainwater precipitation from entering each structure. The secondary containment system of each structure is made of concrete, is curbed to prevent stormwater run-on/run-off into/out of the containment system, is of sufficient volume capacity to contain the largest container, and is sloped to a sump that batch discharges to the overhead process sewer to the site-wide wastewater treatment plant for treatment, monitoring, and discharge via Outfall #001. As stated in Bayer's previous comment letters, all container loading and unloading is done on impermeable concrete/asphalt. Bayer is strongly of the opinion that quarterly inspections of these structures are more than sufficient.

Furthermore, because of the nature of the facility operations, BMPs are serviced as part of standard operating procedure, and not only as a result of performing quarterly inspections. As such, these BMPs are not structures or practices that require separate and frequent monthly stormwater inspections to ensure that adequate maintenance occurs. For example, because the facility's wastewater treatment plant's primary function is to treat process wastewater, and the wastewater treatment plant is monitored 24 hours/day, 365 days/year, no special stormwater inspection is needed to ensure this stormwater BMP is operating correctly.

Data has shown that the facility's SWPPP and BMPs have been successful in preventing stormwater contamination, and when exposure occurs, in the treating of stormwater to meet stormwater benchmarks. This is clearly demonstrated in below Table 1.

Table 1 - Stormwater Benchmark Comparison to Facility Sampling Results (7-6-16)

Parameter	Outfall 003 Sample Results	Outfall 004 Sample Results	Benchmark Limits (A)	Benchmark Exceeded?
Biochemical Oxygen Demand (BOD)	2.7 mg/L	5.7 mg/L	45 mg/L	no
Chemical Oxygen Demand (COD)	13.3 mg/L	26.9 mg/L	90 mg/L	no
Total Suspended Solids (TSS)	26 mg/L	13.0 mg/L	100 mg/L	no
Settleable Solids	ND (0.2)	ND (0.2)	2.5 mL/L/hr	no
Oil & Grease	ND (5)	ND (5)	10 mg/L	no
pH	8.9 SU	8.0 SU	6.0 - 9.0 SU	no

(A) Benchmarks limits from Table A-6 of draft MSOP

Given the facility's unique flat topography behind a U.S. Army Corps of Engineers 500-year flood levee, if a storm drain were to become blocked during a rain event, it would immediately be known to facility personnel since the area would quickly pond with water. The obstruction would quickly be cleared to prevent standing water from blocking the road and flooding of adjacent buildings. This site-specific circumstance makes it unnecessary to inspect storm drains for blockage on a frequent basis.

Under the current site-specific MSOP, Bayer has the flexibility to set an inspection frequency of quarterly (or any frequency that is effective). Bayer's SWPPP was developed under the USEPA guidance document, "*Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*" (EPA document 833-B-09-002). This guidance document states, "*EPA recommends that you develop a routine inspection schedule customized for your facility and specific site conditions . . "* (pg. 33). The guidance also lists a quarterly inspection frequency as an option to consider, which clearly indicates that this is an acceptable minimum site-specific frequency for some facilities. Because Bayer has a site-specific permit, and treats and manages stormwater to a greater extent than many industrial facilities, the facility does not believe that its requirements should be the same as other facilities. Instead, it would be appropriate to give the facility flexibility to design and implement a SWPPP that is aligned with this facility's unique site-specific stormwater treatment and management processes.

Bayer believes that the increase of stormwater inspections from quarterly to monthly is unjustified, burdensome, and will not add value to the operation of the site commensurate with the expenditure of resources to perform the additional inspections. For these reasons, Bayer respectfully requests that the MSOP retain a stormwater inspection frequency of once per quarter.

Response #12
The permit writer has reviewed all the information presented by the permittee and noted new information stating all of the BMPs at the facility are permanent structures which would not necessitate the changing of hay bales or porous media. Because of this reason, the permit writer has determined quarterly inspections shall be continued from the previous permit.

13. The Terms Precision and Accuracy Appearing in Permit Condition are Not Defined (pg. 14):

Special Condition D.15 of the draft permit is titled "Reporting of Non-Detects" and includes seven subparagraphs that impose various analytical laboratory analysis requirements including how to report and handle non-detect analytical testing results. Subparagraph (a) of Paragraph 15 states:

(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.

The terms “precision” and “accuracy” used in this permit condition are not defined in the draft permit, draft Fact Sheet, Division 20 of Clean Water Commission regulations including definitions appearing in 10 CSR 20-2.010, or in 40 CFR Part 136. The terms are also not defined in EPA’s “NPDES Permit Writers’ Manual” (EPA-833-K-10-001) September 2010.

It is not appropriate for the facility to be subject to an analytical testing Quality Assurance/Quality Control (QA/QC) permit condition containing terms that are not defined in the permit or Clean Water Act regulations. Absent specific definitions subjects the facility to regulatory compliance uncertainty and greatly hampers the ability of the facility to consistently comply with proposed Special Condition D.15(a).

It is also not clear when the facility is required to provide a precision number and accuracy number when a parameter is reported as not-detected by the testing laboratory and the format to report the precision number and accuracy number is also not known. For instance, is the facility required to state the precision number and accuracy number in the facility’s monthly discharge monitoring reports when a parameter is not-detected?

The draft permit condition also prohibits the facility from using a narrative description of a test’s precision and accuracy but instead is only allowed to provide a number for each. Prohibition of a narrative description is in contradiction to 40 CFR §136.7. The reason for this limitation is not known and should be explained in the renewed permit.

Furthermore, as a practical matter there is no need for Special Condition D.15(a) since the facility is already required elsewhere in the draft permit to properly collect and handle samples, and to use only approved Clean Water Act wastewater methods that are sufficiently sensitive. In addition, the proposed Special Condition D.15(a) QA/QC reporting requirements are above and beyond what is required by 40 CFR Part 136 since the word “accuracy” does not appear in 40 CFR §136.7. The absence of this term from this regulation is significant because the sole purpose of 40 CFR §136.7 is to establish the minimum twelve QA/QC procedures to be potentially used by a permittee/laboratory when conducting compliance analysis. The terms precision and accuracy are used throughout 40 CFR Part 136, but their mention is in a holistic context that are to be achieved by a permittee following approved sampling methods and QA/QC protocols.

In consideration of the above reasons, and additional points presented in below Comment 15 and Comment 16, Bayer respectfully requested that the proposed Special Condition D.15(a) be deleted and not appear in facility’s renewed MSOP.

Absent removal of Special Condition D.15(a) from the permit, the draft permit should be revised to clearly define the term precision, define the term accuracy, and include detailed instructions on how and when the facility is required to report their numbers to the MDNR. The facility also kindly requests that the MDNR provide several examples of how other facilities in Missouri report test method’s precision numbers and accuracy numbers.

Response #13
Special condition #15 does not explicitly require the facility to report the analytical precision and/or accuracy. Each method found in 40 CFR 136 has quality assurance and quality control requirements; each laboratory will establish any QA/QC procedures, including in-house reporting limits of the tests employed. The permit writer has reason to believe special condition 15(a) was a carry-over from before 40 CFR 136.7 was added in rule in June 2012. The condition is redundant of standard conditions and mildly vague therefore was removed as several other permit requirements which are essentially the same exist in the permit. The text “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.” was removed from the permit.

14. Requirement to Report Accuracy Number when Performing pH Analysis (pg. 14):

The draft permit requires the facility to sample Outfall #001 for pH on a continuous basis, Outfall #002 on a monthly basis, and stormwater Outfall #003 and Outfall #004 when sampled.

As stated in Bayer’s above Comment 14, draft permit Special Condition D.15(a) is ambiguous and thus should be deleted and not appear in the facility’s renewed MSOP. If however the MDNR retains D.15(a), as explained below the text of Subparagraph (a) needs to be revised to exclude the requirement for the facility to report accuracy number for pH analysis.

Subparagraph (a) of Special Condition D.15 of the draft permit states:

(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.

As explained in Bayer' above Comment 14, the terms "precision" and "accuracy" are not defined in the draft permit, draft Fact Sheet, or in 40 CFR Part 136. The terms are also not defined in EPA's "NPDES Permit Writers' Manual" (EPA-833-K-10-001) September 2010.

The facility was able to find the following definitions of "precision" and "accuracy" from a Wisconsin Department of Natural Resources web page for Laboratory Certification Program (PUBL-TS-056-96) April 1996 (as visited February 14, 2018):

precision - is a measure of the random error associated with a series of repeated measurements of the same parameter within a sample. Precision describes the closeness with which multiple analyses of a given sample agree with each other, and is sometimes referred to as reproducibility.

accuracy - is *a combination of the bias and precision* of an analytical procedure, which reflects the closeness of a measured value to a true value. (emphasis added)

bias - provides a measure of systematic, or determinative error in an analytical method. Bias is determined by assessing the percent recovery of spiked samples.

In order to determine the accuracy of a pH test, the method's bias and precision must be known. Since the concepts of matrix spike and matrix spike duplicate are not applicable to pH, the bias of pH analysis cannot be determined. Thus, since the bias of a pH test cannot be determined, by extension it is also not possible to enumerate the accuracy of a pH test. There are numerous sources that document the concept of bias is not applicable to pH analysis. One reference is in EPA's response to comments regarding May 18, 2012 rulemaking modifying Clean Water Act testing procedures when EPA said:

> "With respect to the issue of applicability of QC elements, EPA agrees with commenters who stated that some QC elements listed in §136.7 may not apply to common parameters (e.g., matrix spike and matrix spike duplicates do not apply to pH measurements.)" (source: 77 FR 29769, col. 1, May 18, 2012)

Therefore, since it is not possible to enumerate the accuracy of a pH measurement, the facility's permit cannot include a permit condition requiring it.

The facility therefore again requests that Special Condition D.15(a) be deleted and not appear in facility's renewed permit. Should the MDNR nevertheless desire to retain the requirement, the facility requests that the draft text be revised to specifically exclude the accuracy requirement for pH analysis.

Response #14
Please refer to response #13.

15. Requirement to Report Precision and Accuracy of Biological Test Methods (pg. 14):

The draft MSOP proposes the sampling of Outfall #001 using three biological test methods including: *E. coli*, biochemical oxygen demand (BOD), and chronic whole effluent toxicity (WET).

As stated in Bayer's above Comment 14, proposed draft Special Condition D.15(a) should be deleted and not appear in the facility's renewed MSOP. If however the proposed condition is retained, as explained below the text of Subparagraph (a) should be revised to exclude the requirement for the facility to report an accuracy number for biological test methods.

Subparagraph (a) of Special Condition D.15 of the draft permit states:

(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.

As explained in Bayer' above Comment 14, the terms "precision" and "accuracy" are not defined in the draft permit, draft Fact Sheet, or in 40 CFR Part 136. The terms are also not defined in EPA's "NPDES Permit Writers' Manual" (EPA-833-K-10-001) September 2010. And as further explained in above Comment 15, the facility was able to find the following definition of "accuracy" from a Wisconsin Department of Natural Resources web page,

> accuracy - is *a combination of the bias and precision* of an analytical procedure, which reflects the closeness of a measured value to a true value. (emphasis added)

Accuracy thus is a composite of two distinct characteristics: "precision" and "bias." Precision measures the variation among the results of multiple tests of the same sample, whereas bias describes any systemic and persistent deviation of the average value of a test method from and accepted "true value." [67 FR 69965, November 19, 2002] While precision can be evaluated for biological tests, "bias" cannot because it relies on comparisons with an independent, objective, "true value." When measuring chemical concentration, for example, it is a simple matter for a laboratory to combine pure water with a given toxicant in a certain ration, and then assess the ability of instruments correctly to ascertain this known concentration. But for method-defined analytes such as *E. coli*, BOD, and WET, there is no such thing as a "true value" independent of the tests themselves. This does not mean that the tests are inaccurate, but rather that the biological test methods scientific validity must be assessed through other means.

A WET test involves exposing multiple batches of living aquatic organisms to effluent at various concentrations of sample wastewater, to evaluate their biological effects - growth, survival, and reproduction, over a set period of time. Statistical analysis of the responses is then used to estimate the effects of the test effluent sample. Effects on growth and reproduction, as statistically compared to a control group of organisms exposed to a zero concentration of effluent, are considered sublethal effects.

Special Condition D.4(a) of the draft permit specifies that the chronic WET tests must be performed following the most recent edition of "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (EPA/821/R-02/013; Table IA, 40 CFR Part 136). As of the date of this comment letter the most recent version of this document is the 4th edition dated October 2002. Section 11 of this document provides the EPA test method 1000.0 for Fathead Minnow, *Pimephales promelas* (survival and growth) and Section 13 provides EPA test method 1002.0 for Daphnid, *Ceriodaphnia dubia* (survival and reproduction). Both test methods include a section titled "Precision and Accuracy," and a subsection titled "Accuracy." The entire Accuracy subsection of the Fathead Minnow method is just a single sentence that reads:

> 11.14.2.1 The accuracy of toxicity tests cannot be determined.

An identical statement appears for the *Ceriodaphnia dubia's* test method under subsection 13.14.2.1 that reads "The accuracy of toxicity tests cannot be determined." A copy of Section 11.14 and Section 13.14 are included in Attachment II of this letter.

It is therefore not possible for the facility to enumerate the accuracy of chronic WET tests because the WET test methods specifically state that the test's accuracy cannot be determined. The facility clearly cannot be subject to a permit condition that is impossible to comply with.

BOD determines the amount of dissolved oxygen consumed by bacteria and microorganisms to break down organic material present in a given wastewater sample. BOD is a method-defined analyte and is not a precise quantitative test. The most widely used method is Standard Methods 5210B. It is clear from the BOD test method that it is not possible to quantify (i.e., enumerate) the bias of BOD method. Specifically, Section 6 of Method 5210B is titled Precision and Bias and states: "There is no measurement for establishing bias of the BOD procedure." A copy of Section 6 is included in Attachment III of this letter. Accordingly, since the bias of a BOD test cannot be established, by extension it is also not possible to determine the accuracy of a BOD test.

The facility has little experience with *E. coli* test method since the facility has never been subject to *E. coli* monitoring requirements. It is therefore not possible to provide detailed comments on the ability of the facility to provide enumerated precision and accuracy of *E. coli* analysis under the proposed terms of the facility's future MSOP. However, since *E. coli* is a method-defined analyte microbiological test, and because the bias of microbiological tests cannot be determined, it can be concluded that the accuracy of *E. coli* test cannot be enumerated.

To be clear, the facility believes that using EPA approved methods, accurate sampling results for biological parameters such as *E. coli*, BOD, and chronic WET will be generated. The facility's disagreement with proposed Special Condition D.15(a) is the permit condition's requirement that the accuracy of biological tests be enumerated. The concept of accuracy is not applicable to biological test methods and therefore should, and cannot, be required.

Bayer requests that subparagraph (a) be revised to limit its applicability to only analysis performed by non-living laboratory instruments and specifically exclude biological tests. This is because as explained above, biological tests such as *E. coli*, BOD, and WET use living organisms and test methods using live organisms do not lend themselves to the same types of Quality Assurance/Quality Control (QA/QC) requirements as laboratory analysis performed using conventional laboratory instruments. It is therefore not always possible to generate "precision" or "accuracy" for a biological test as done with analysis performed using a conventional laboratory instrument.

Response #15
Please refer to response #13.

16. Requirement that Biological Test Results Reported as Non-Detected must Include a Detection Limit (pg. 14):

Subparagraph (b) of Special Condition D.15 of the draft permit states:

> (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.

As explained below, this draft permit condition is not appropriate and thus must be modified because it imposes a reporting obligation that the facility will not be able to consistently comply with when performing biological sampling to no fault of the facility.

The Clean Water Act approved test methods for analysis of pollutants in wastewater effluent are codified in 40 CFR Part 136. The term "detection limit" is defined in 40 CFR §136.2(f) to mean:

> Detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure set forth at appendix B of this part.

Appendix B to Part 136 provides a detailed procedure on how to determine the method detection limit (MDL) of a physical or chemical test method using an instrument. There are also several EPA guidance documents on the topic including "Definition and Procedure for the Determination of the Method Detection Limit, Revision 2" (EPA 821-R-16-006) dated December 2016 (hereinafter "EPA Detection Limit Guidance document"). A copy of EPA Detection Limit Guidance document is included in Attachment IV of this letter.

The draft MSOP proposes the sampling of Outfall #001 using three biological test methods including: *E. coli*, biochemical oxygen demand (BOD), and chronic whole effluent toxicity (WET). It is clear from Appendix B of 136 and the above cited EPA Detection Limit Guidance document that the term "detection limit" is limited to conventional laboratory analytical testing instruments and is not applicable to biological test methods. Specifically, the third page of the EPA Detection Limit Guidance document states:

> "The MDL procedure is *not* applicable to methods that do not produce results with a continuous distribution, such as, but not limited to, methods for whole effluent toxicity, . . . , and microbiological methods that involve counting colonies. The MDL procedure also is *not* applicable to measurements such as, but not limited to, biochemical oxygen demand, color, pH, . . ." *(emphasis in original)*

Though the quoted guidance language is enough by itself to conclude that the facility's three biological sampling requirements do not have MDLs and therefore the facility's MSOP cannot include a permit condition requiring MDL be reported when performing biological sampling, there is additional evidence and argument supporting this conclusion.

The following paragraph provides additional support that WET tests do not have method detection limits. When EPA promulgated WET test methods in November 2002, the topic of the WET's method detection limit was discussed several times in the method's Federal Register preamble. One discussion pertained to the false positive rate of WET tests. Commenters were concerned that because WET tests do not have method detection limits as contained in chemical test methods, WET tests would be prone to higher instances of reporting false positive results. In response EPA acknowledged that WET tests do not have MDL when EPA stated:

> ". . , method detection limit concepts are not applicable to WET test methods and have not been applied historically to toxicity testing methods developed by EPA or by voluntary consensus standards bodies. EPA established the method detection limit (MDL) concept specifically for chemical methods, where results generally consist of a single measurement of the pollutant of interest by an analytical instrument." (source: 67 FR 69968, col. 2, November 19, 2002)

A copy of page 669968 is included in Attachment V of this letter.

Therefore, since EPA guidance definitively states that the concept of MDL is not applicable to biological tests such as *E. coli*, BOD, and WET, it is not appropriate for the facility's MSOP to impose a requirement that the facility provide MDL when performing biological sampling. The concept of detection limit applies only to analytical methods that rely on mechanical instrumentation to measure pollutant concentrations.

The facility acknowledges the common practice of biological testing laboratories reporting results with a less than sign followed by a number (e.g., <10 MPN/100 ml), however, it must be understood that although the results reported in this format resemble in appearance how detection limits are reported, they in fact are not detection limits as that term is specifically defined by the Clean Water Act. Furthermore, the facility is not opposed to reporting biological test results using this format, but the permit condition imposing the requirement must use a term such as "reporting limit" and not a biological test's detection limit. The term "reporting limit" is typically defined to mean "the minimum value below which data are documented as non-detects."

In consideration of above comment, Bayer proposes that a new lettered subparagraph be added to Special Condition D.15 and that it state:

> (h) When performing biological test methods such as *E. coli*, BOD, and WET, the permittee shall not report a sample result as "Non-Detect" without also reporting the reporting limit of the test. This special condition supersedes above item D.15(b).

Response #16
The permit writer thanks the commenter for providing the reference document and other supporting information, in lieu of this new information, the permit writer has determined the language addition is warranted. This condition was added as special condition #15 (b).

17. Instructions on Format to Report Non-Detect Analytical Results (pg. 14):

Subparagraph (c) of Special Condition D.15 of the draft permit states:

> (c) The permittee shall report the "Non-Detect" results using the less than sign and the method detection limit (e.g., <10)

Although the facility is not yet using the eDMR system, there is a concern that the mandated reporting format of non-detects appearing in Subparagraph (c) may not match the reporting instructions for non-detects of the eDMR system. If this were to occur, the facility would be put in the difficult position to either purposely not comply with a permit reporting condition, or to enter data into eDMR system in a format contrary to the system's instructions. Furthermore, even if the Subparagraph (c) instructions are identical on how non-detect data is currently entered into eDMR, there is a possibility that the eDMR instructions might change in the future and become different than Subparagraph (c).

To resolve this current and/or potential future permit reporting compliance problem, Bayer suggests that a new subparagraph be added to Special Condition D.15 and that the new subparagraph say something along the lines: (i) When reporting data using eDMR system, the permittee is to follow eDMR data entry format and reporting instructions.

Response #17
The suggested sentence was added to the end of the special condition which is currently #15 (b).

18. Missing Instructions on how to use Non-Detect to Calculate a Parameter's Daily Discharge Mass (pg. 14):

The purpose of this comment is to request that the facility's draft permit be revised to include instructions on how a parameter's daily discharge mass (i.e., pounds/day) should be calculated when a testing laboratory reports a non-detect result. The facility is seeking this clarification because although the draft MSOP includes instructions on how the facility is to calculate monthly averages and geometric means when sampling results are reported below a parameter's MDL, the draft permit does not include similar instructions for daily discharge calculations. The facility expects the instructions to be the same for daily discharges because the monthly average discharge of a parameter is derived from the parameter's daily discharges as defined in 40 CFR §122.2 that states:

> *Average monthly discharge limitation* means the highest allowable average of ''daily discharges'' over a calendar month, calculated as the sum of all ''daily discharges'' measured during a calendar month divided by the number of ''daily discharges'' measured during that month.

In instances where one sample is collected during a month, the single sample serves as both the daily discharge and monthly average for permit compliance determination purposes.

The draft permit's instructions for calculation of monthly averages and geometric means in instances of non-detects is found in Subparagraph (f) of Special Condition D.15 that states:

> (f) When calculating monthly averages or geometric means, one-half of the method 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).

Missing from Subparagraph (f), and elsewhere in the draft permit, are instructions on how the facility is to calculate a parameter's daily discharge mass when a testing laboratory reports results of non-detect; except for the effluent parameter Total Organic Pesticide Chemicals which has its own unique instructions.

The facility's renewed MSOP needs to include these instructions for a number of reasons. One reason is that without specific instructions the facility is subject to uncertainty on the correct way to calculate daily pounds discharged in incidents of non-detects. Absent specific instruction it is not known if zero, the MDL, or one-half the MDL should be used. This uncertainty leads to potential incorrect regulatory reporting, inconsistent reporting, incorrect compliance determinations, and enforcement exposure for the facility. The draft permit has over 30 parameters that are subject to daily discharge permit limitations.

Another reason the draft permit needs daily discharge instructions, and for those instructions to be identical to those for monthly average, is to ensure the efficient and correct preparation of the facility's monthly discharge monitoring reports (DMRs). The best way to illustrate how having two different instructions complicates compliance and reporting is by an example. Suppose during the month the facility collects one chemical oxygen demand (COD) sample on January 10 and the testing laboratory reports non-detect at a method detection limit of 200 mg/L (e.g., <200 mg/L). The single COD result and daily flow data for the month are summarized in Example 1 spreadsheet included in Attachment VI of this letter. It is standard practice for facility's to use a spreadsheet like this to present data in a commonly recognized, intuitive format, where the daily, maximum, and average discharge values of a parameter can be clearly and easily known.

As seen by looking at the Example 1 spreadsheet, using different instructions to calculate daily discharge and monthly average values from a single non-detect sample gives the appearance that there are two errors in the table. The first error is the disagreement between the daily discharge mass of COD on January 10 and the monthly average mass of COD discharged. The daily discharge value is 2,802 lbs COD/day whereas the monthly average rate is 1,401 lbs COD/day. Most people looking at this table would have an expectation that both values should match. The second appearance error would occur if a future user of the data attempted to recreate the reported monthly average value of 1,401 lbs COD/day by using the 1,780,000 gallons/day flow in the row that the monthly average value appears in. However, if this average flow is used, a different monthly average value of 1,483 lbs COD/day would be calculated. Furthermore, weekly sampling for a parameter where one or more results are non-detect during the month exponentially compounds the complexity of tabulating monthly data if different non-detect instructions apply as seen in hypothetical Example 2 in Attachment VII of this letter. As these examples illustrate, the method used to calculate a parameter's daily discharge and monthly average from a single non-detect result should be the same.

The third reason the draft permit needs daily discharge instructions, and for those instructions to be identical to those for monthly average, is the facility's future use of the eDMR system. Although the facility is not yet using eDMR's, it is our understanding that it is common practice for facility's to summarize monthly effluent data on a single spreadsheet, similar to Example 1 and Example 2, and to upload the spreadsheet data directly into the eDMR system. Bayer speculates that if different instructions are required to be used to calculate daily discharge and monthly average for non-detect results, the facility would lose the ability to upload summary spreadsheets into the eDMR system and instead be required to manually enter all data. In addition, it also seems likely that the eDMR system might have built in automatic compliance cross-checks such as calculating a parameter's monthly average from daily discharge values and then comparing that calculated value to the monthly average reported by the facility. If true, it provides another reason that daily discharge and monthly average calculations using non-detect values should be the same.

Since as stated above the method to calculate a parameter's daily discharge in instances of non-detect should be identical to monthly average's method, the simplest way to add the requested instruction to the draft permit would be to slightly modify draft Subparagraph (f). A suggested revised Subparagraph (f) would read:

(f) When calculating daily discharge, monthly averages, or geometric means, one-half of the method 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).

Should specific instructions not appear in the facility's renewed permit the facility will assume the calculation of daily discharge mass from non-detects will be the same as is done for monthly averages because monthly average values are derived from daily discharge values.

Response #18
This facility is unique in its rigorous testing procedures and more than once per day sampling procedures so it was unlikely the standard permit language anticipated these practices. As such, the permit language was edited to the proposed language above. As condition subsection (a) was removed, this condition is subsection (e); and reference (c) was changed to reference (b).

19. Typographic Errors Identified:

The following typographic errors were identified during Bayer's review of the draft permit and Fact Sheet. Presumably the MDNR is already aware of and has corrected the typographic errors, but we are providing them here nevertheless for completeness:

a.) (draft permit, pg. 3) - Under description of Outfall #001 at the top of page 3, the second to last sentence of the first paragraph includes a minor typographical error likely caused by MS Word autocorrect function. The word "form" appears between the words "discharges" and "the", whereas the correct word should be "from." As corrected, the second to last sentence would read: "Cooling tower blowdown and non-routine discharges from the cooling towers are also directed to the treatment system."

b.) (draft permit, pg. 3) - At the bottom of page 3 of the draft permit, under heading Internal Monitoring Outfall #005, the name of the referenced discharge source is slightly misstated. The draft permit incorrectly identifies the source as "Fenton Oxidizing unit" whereas the correct name is "Fenton Oxidizing Plant."

c.) (draft permit, pg. 14) - Subparagraph (f) of Special Condition D.15 includes a cross-reference to Subparagraph (c) of the same paragraph. There is a minor typographical error in the cross-reference in that the draft text uses an uppercase capital "C" within the parentheticals whereas the letter should be a lowercase "c", and as revised would read (c).

d.) (draft Fact Sheet, pg. 11) - The third bullet under Technology-based limitations section of Fact Sheet makes an incorrect reference to a special condition of the draft permit. Specifically, the draft Fact Sheet states "Sampling is not continued however, special condition #D.15 directs the facility to . . ." It appears that the reference to #D.15 is incorrect that that the correct cross-reference should be to special condition #D.13 on page 14 of draft MSOP.

e.) (draft Fact Sheet, pg. 22) - The last sentence under section titled Schedule of Compliance (SOC) incorrectly states the facility will be subject to a SOC for ammonia upon permit reissuance. This is not correct. The facility will be subject to *E. coli* SOC and not an ammonia SOC.

f.) (draft Fact Sheet, pg. 28) - A typographical error appears regarding sample type in Table #001 on page 28 for the parameter Metribuzin. Specifically, the draft Table #001 incorrectly states that Metribuzin's sample type will be "grab" when in fact Metribuzin's sample type should be comp. (i.e., 24-hour composite).

g.) (draft Fact Sheet, pg. 29) - A typographical error appears regarding sample type in Table #001 on page 29 for the parameter Phenol. Specifically, the draft Table #001 incorrectly states that Phenol's sample type will be "grab" when in fact Phenol's sample type should be comp. (i.e., 24-hour composite).

h.) (draft Fact Sheet, pg. 29) - A minor error appears regarding cited previous permit limit in Table #001 on page 29 for the parameter chronic WET test. Specifically, the draft Table #001 states the previous chronic WET test permit limit is 535 TUc when in fact the previous value was 531 TUc.

Response #19
The permit writer thanks the permittee for indicating the typographical errors throughout the permit and fact sheet. All changes were made.

Additional notes. The basis for limitations codes were removed in the fact sheet tables in Part IV for all outfalls. Each decision is captured in the narrative in the fact sheet therefore the column is no longer required.

After review of the public notice comments and permit writer responses, the permit writer has determined none of the changes made to the permit require an additional public notice comment period.

DATE OF FACT SHEET: JUNE 6, 2018

COMPLETED BY:
PAM HACKLER, ENVIRONMENTAL SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
(573) 526-3386
pam.hackler@dnr.mo.gov

Appendix – Antidegradation Analysis

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to

Missouri River

by
Bayer CropScience LP
MO-0002526

April, 2019

1. FACILITY INFORMATION

FACILITY NAME: Bayer CropScience LP NPDES #: MO-0002526

FACILITY TYPE: INDUSTRIAL – Agricultural chemical manufacturing and formulation facility – SIC #2879, #2819

PROJECT DESCRIPTION: The Bayer CropScience LP facility manufactures and formulates agricultural crop protection products, such as herbicides, insecticides, fungicides, and seed treatments. On December 3, 2018, the facility began manufacturing a new pesticide chemical, Fluopyram, at a reduced production rate of approximately 8,943.6 pounds per day. The facility is proposing to increase its production rate and begin the full-scale production of Fluopyram at a manufacturing rate of 85,435 pounds per day (lbs/day), which is equivalent to 28,535,294 pounds per year (lbs/year). In total, the facility's long-term organic pesticide manufacturing rate will increase from the current permitted rate of 491,050 lbs/day by an additional 85,435 lbs/day to a new production rate of 576,485 lbs/day. Additionally, the amount of process wastewater generated from intermediate production will increase from 768,377 gallons per day (gpd) to 785,177 gpd. The effluent wastewater associated with the production of Fluopyram will be discharged through Outfall #001. The design flow of Outfall #001 will remain unchanged at 2.80 million gallons per day (MGD).

COUNTY:	Jackson	UTM COORDINATES:	X= 372980 / Y= 4332150
12- DIGIT HUC:	10300101-0301	LEGAL DESCRIPTION:	NW ¼, NW ¼, Section 29, T50N, R32W
EDU*:	Blackwater / Lamine	ECOREGION:	Missouri River Alluvial 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 receiving water body, the Missouri River, has an EPA approved TMDL for chlordane and Polychlorinated Biphenyls (PCBs). The TMDL does not implement limitations or indicate this facility as a cause of the impairment. The Missouri River is also listed on the 2018 Missouri 303(d) list for *Escherichia coli*. A TMDL has not yet been developed.

The facility's existing Missouri State Operating Permit (MSOP) was issued on July 1, 2018 and expires on June 30, 2023. Based on discharge monitoring report (DMR) data submitted by the facility, the actual average flow over the last five years was approximately 1.3 MGD, which is well below the permitted design capacity of 2.80 MGD. A review of the facility's DMR data also indicated the following effluent limit exceedances: COD on the July 2015 and November 2013 DMRs, Total Organic Pesticide Chemicals on the November 2017, August 2016, and May 2016 DMRs, and TSS on the July 2017 and May 2017 DMRs.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	4.33	Advanced Treatment System	Missouri River	0.0

3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)**			DESIGNATED USES*
			1Q10	7Q10	30Q10	
Missouri River	P	0356	12,131	15,323	19,273	DWS, HHP, IND, IRR, LWW, SCR, WBC-B, WWH (AQL)

* 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 taken from Bayer CropScience LP Missouri State Operating Permit effective July 1, 2018.

RECEIVING WATER BODY SEGMENT #1: Missouri River
Upper end segment* UTM coordinates: X= 372980 / Y= 4332150 (Outfall)
Lower end segment* UTM coordinates: X= 377314 / Y= 4333933 (Significant Existing Source Discharge Location)
*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

Barr Engineering prepared, on behalf of Bayer CropScience LP, the *Bayer CropScience LP Antidegradation Review Report* dated March 12, 2019.

Applicant elected to determine that discharge of all pollutants of concern (POC) is non-degrading to the receiving stream. This analysis was conducted to fulfill the requirements of the AIP. Dissolved oxygen modeling (Appendix B) analysis and facility assimilative capacity calculations were submitted for review. Staff believes that the results of the model are protective of the water quality standards for dissolved oxygen. Information that was provided by the applicant in the submitted report and summary forms in Appendix C was used to develop this review document.

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

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *Bayer CropScience LP Antidegradation Review Report* dated March 12, 2019.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern proposed to be impacted by the production of Fluopyram (see Appendix C). Pollutants of concern 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). Tier 2 is assumed for all POCs (see Appendix C).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION
Biochemical Oxygen Demand$_5$ (BOD_5)	2	Non-degrading
Chemical Oxygen Demand (COD)	2	Non-degrading
Total Organic Pesticide Chemicals (TOP)	2	Non-degrading
Total Suspended Solids (TSS)	2	Non-degrading

* 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 C were used by the applicant:
For pollutants of concern, the attachments are:

☒ Attachment B, Tier 2 with minimal degradation.

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. Low flow values were taken from the current Bayer CropScience LP MSOP effective July 1, 2018. Existing water quality data submitted by the applicant was taken from the St. Joseph gage (06818000) upstream of the discharge on the Missouri River and the Hermann gage (06934500) downstream of the discharge on the Missouri River.

The consultant also supplied a Streeter Phelps Analysis (Appendix B) to determine the effect of the facility's increased discharge of Fluopyram on the dissolved oxygen concentration in the receiving stream. Information to determine the physical characteristics of the Missouri River for the Streeter Phelps model was taken from the Kansas City, MO Gage (068893000). Additional information used in the model was taken from collected facility data and facility Discharge Monitoring Reports (DMRs).

5.3. Losing Stream Alternative 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 facility does not discharge to a losing stream segment or will not discharge within 2 miles of a losing stream segment.

5.5. Non-Degrading Demonstration

The current facility MSOP effective July 1, 2018 contains effluent limits for numerous pesticide chemicals as specified by the Effluent Limitation Guidelines regulations (ELG) listed in 40 CFR 455 and Table
4-BAT and NSPS Effluent Limitations for Priority Pollutants for Direct Discharge Point Sources that Use End-of-Pipe Biological Treatment. The concentration of the these individual pesticide chemicals being discharged through Outfall #001 will not be affected by the production of Fluopyram, and therefore are not being evaluated as POCs in this antidegradation review. The effluent limits for these parameters will remain as issued in the MSOP and the current loading will be maintained.

Additionally, there is no numeric water quality criterion for the pesticide chemical Fluopyram; therefore, the conditions associated with the increased production of Fluopyram are being evaluated as a surrogate to determine the impact of the discharge on the receiving water body quality and its beneficial uses. As listed in Table 1, the pollutants of concern associated with the increased production of Fluopyram are BOD_5, COD, TOP, and TSS. Table 2 below summarizes the current loading of these POCs based on the current permit concentrations and proposed loadings based on the proposed permit concentrations.

Table 2. Summary of Current and Proposed Monthly Average Permit Limits for POCs

Pollutants of Concern	Current Monthly Average limit (mg/L)	Proposed Monthly Average Limit (note 1) (mg/L)	Current loading (lbs/day)	Proposed Loading (lbs/day)	Net change (lbs/day)
BOD_5	61	67	1,418	1,561	143
COD	312	345	7,224	8,000	776
TOP	0.11	0.11	2.5	2.6	0.1
TSS	74	81	1,726	1,887	161

Note 1- The proposed effluent limits that were provided by applicant were determined using updated production data and the calculation methods in the Fact Sheet of the facility's current MSOP.

Current design flow (Qd) = 2.80 MGD
Mass conversion -- 1 mg/L = 8.34 lbs/million gallons
Wasteload Allocation (WLA) = maximum daily or weekly average

Existing Load (lbs/day) = Mass conversion * WLA * Qd
Example: 8.34 (lbs/MG)/(mg/L) * 1 mg/L * 2.80 MGD = 23.3 lbs/day

As there are no water quality standards for BOD_5, COD, and Total Organic Pesticide Chemicals, dissolved oxygen modeling was used as a means to determine the effect of the increased load of these pollutants on the receiving water body. Streeter Phelps modeling was prepared by the applicant to determine the critical dissolved oxygen (DO) sag during current permitted conditions and during the proposed permitted conditions. The model allows for inputs of $CBOD_5$ and NBOD, so in order to utilize the model, the consultant developed a $CBOD_5$ and NBOD concentration that would approximate the concentration of COD in the discharge from the facility to the Missouri River. Specific model inputs can be seen in Appendix B. Based on current permit limits, the model estimated the initial mixed Missouri River concentration to be 3.0 mg/L $CBOD_5$ and 6.5 mg/L NBOD. Using the proposed permit limits in the model resulted in no change to the initial mixed Missouri River concentrations of $CBOD_5$ and NBOD. Additionally, the critical DO deficit below the calculated DO saturation value did not change from current to proposed permitted conditions. The modeled lowest DO level or critical DO sag was 5.41 mg/L for both current and proposed permitted conditions. This concentration is greater than the water quality standard for DO of 5 mg/L. As a result of this analysis, Department staff concludes that the proposed effluent limits for BOD_5, COD, and Total Organic Pesticide Chemicals are protective of beneficial uses and existing water quality of the Missouri River. For these reasons, the increase in load for BOD_5, COD, and Total Organic Pesticide Chemicals was determined to be non-degrading. The fourth pollutant of concern evaluated, TSS, also does not have a water quality standard. The increase in the TSS pollutant load was determined to be non-degrading as the proposed increase is minimal and will not impact beneficial uses or create adverse conditions in the receiving waterbody.

5.6. 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. Thus, the Tier 2 Review is not required.

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 CONSIDERATIONS TABLE (TAKEN FROM MSOP EFFECTIVE JULY 1, 2018)**:**

WATERBODY	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
Missouri River (standard)	3033	3831	4818	303	383	482
Missouri River [per 10 CSR 20-7.031(5)(A)4.B.(III)(b)]	3033	3831	4818	43.4 *	43.4 *	43.4 *
CORMIX2 Model	n/a	535 **	n/a	n/a	446 **	n/a

* Per 10 CSR 20-7.031(5)(A)4.B.(III)(b): ZID cannot be more than 10 times the facility design flow. DF = 4.34 MGD

** The facility has installed a diffuser which allows for a larger zone of initial dilution per 10 CSR 20-7.031 (5)(A)4.B.(III)(b). In a CORMIX2 model dated 2/5/2008 submitted to the department, the model showed the effluent was completely mixed at the ZID at 446 times the effluent at the edge of the zone of initial dilution (acute); and for the MZ at 535 times the effluent at the end of the mixing zone (chronic). These values were used to calculate water quality limitations when the 7Q10 value is used for calculations.

8. PERMIT LIMITS AND MONITORING INFORMATION

TABLE 3. SUMMARY OF PROPOSED EFFLUENT LIMITS FOR EVALUATED POCS (OUTFALL #001)

PARAMETER	UNITS*	DAILY MAXIMUM	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
BOD_5	LBS/DAY	6,643	1,561	NDEL	ONCE/WEEK
COD	LBS/DAY	11,650	8,000	NDEL	ONCE/WEEK
TOP	LBS/DAY	7.9	2.6	NDEL	ONCE/WEEK
TSS	LBS/DAY	6,332	1,887	NDEL	ONCE/WEEK

NOTE 1– WATER QUALITY-BASED EFFLUENT LIMITATION – WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT –MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT – PEL; OR TECHNOLOGY-BASED EFFLUENT LIMIT – TBEL; OR NO DEGRADATION EFFLUENT LIMIT – NDEL; OR FEDERAL/STATE REGULATION – FSR; OR NOT APPLICABLE – N/A. ALSO, PLEASE SEE THE **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.**

* The facility shall calculate pounds per day by using the concentration in part per million (ppm) multiplied by 8.34 and multiplied by MGD. Any analyte reported in µg/L (ppb) shall be converted to mg/L (ppm) first.

As Biochemical Oxygen Demand$_5$, Chemical Oxygen Demand, Total Organic Pesticide Chemicals, and Total Suspended Solids were the only pollutants of concern identified in this Antidegradation Review, all other effluent limits in the facility's current Missouri State Operating Permit effective July 1, 2018 shall remain in effect as issued.

9. DERIVATION AND DISCUSSION OF LIMITS

9.1. OUTFALL #001 – MAIN FACILITY OUTFALL

9.2. LIMIT DERIVATION

Limits were derived based on the updated production data and the calculation methods in the Fact Sheet of the facility's current MSOP effective July 1, 2018.

- **Biochemical Oxygen Demand (BOD_5).**

ELG SECTION	PERMITTEE'S VALUES	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures pesticides in lbs/day	576,485	7.4	1.6	pounds per 1000 pounds	4,265.99	922.38
BPT/BPJ 455.22 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.785177	120	45	8.34	785.81	294.68
SUM					**6,643**	**1,561**

- **Chemical Oxygen Demand (COD)**.

ELG SECTION	PERMITTEE'S VALUES	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	576,485	13	9	pounds per 1000 pounds	7,494.31	5,188.37
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.785177	120	45	8.34	785.81	294.68
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %ile daily max; x2.1 monthly average	236.58	496.81
SUM					**11,650**	**8,000**

- **Total Organic Pesticide Chemicals (TOP).**

Total Organic Pesticide Chemicals	Permittee's Value	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/day	Monthly Average in lbs/day
BPT 455.20 manufacture in lbs/day	576,485	0.01	0.0018	0.001	5.7649	1.03767
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.9**	**2.6**

- **Total Suspended Solids (TSS).**

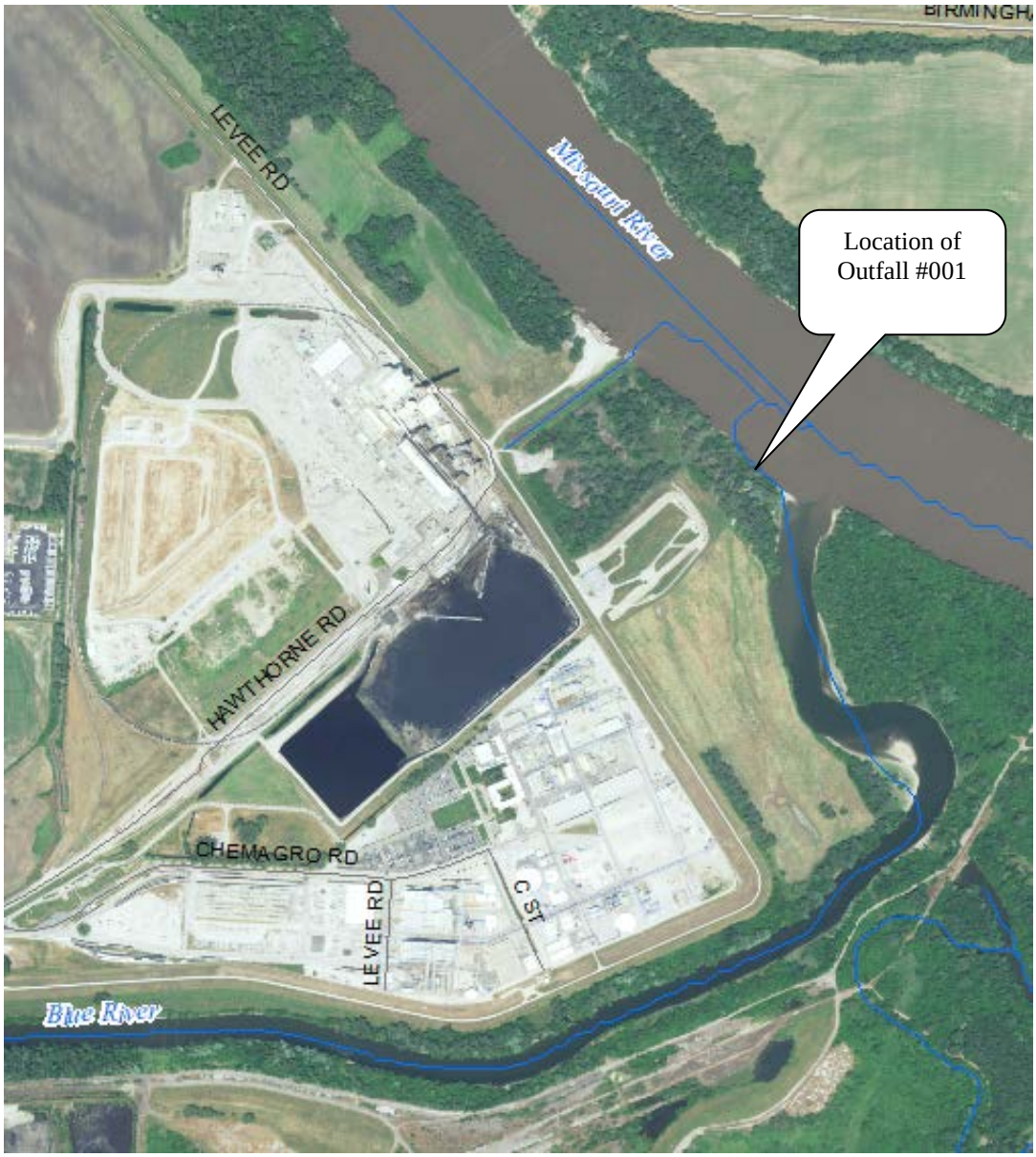
ELG SECTION	PERMITTEE'S VALUES	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 pesticide manufacture in lbs/day	576,485	6.1	1.8	pounds per 1000 pounds	3,516.56	1,037.67
BPT/BPJ 455.22 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.785177	183	57	8.34	1,198.35	373.26
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**6,322**	**1,887**

11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed facility discharge will result in no degradation of the segment identified in the Missouri River. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. 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: Ellen Modglin
Date: April 2019
Unit Chief: John Rustige, P.E.

Appendix A: Map of Discharge Location Outfall #001 and the Bayer CropScience LP Facility Location.



Appendix B: Summary of Dissolved Oxygen Modeling using Streeter Phelps Analysis

Table 3a - Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag during Current Conditions
Bayer CropScience, Kansas City, MO

INPUT			
1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			4.3
CBOD5 (mg/L):			61.2
NBOD (mg/L):			79.5
Dissolved Oxygen (mg/L):			7.7
Temperature (deg C):			32.2
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			15323
Upstream CBOD5 (mg/L):			3.0
Upstream NBOD (mg/L):			5.6
Upstream Dissolved Oxygen (mg/L):			6.6
Upstream Temperature (deg C):			25.2
Elevation (ft NGVD):			719
Downstream Average Channel Slope (ft/ft):			0.00015
Downstream Average Channel Depth (ft):			7.6
Downstream Average Channel Velocity (fps):			2.8
3. REAERATION RATE (Base e) AT 20 deg C (day^-1):			1.06
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	1.06
O'Connor and Dobbins	.1 - 1.5	2 - 50	1.04
Owens	.1 - 6	1 - 2	1.01
Tsivoglou-Wallace	.1 - 6	.1 - 2	0.97
4. BOD DECAY RATE (Base e) AT 20 deg C (day^-1):			0.39
Reference			Suggested Value
Wright and McDonnell, 1979			0.39

OUTPUT	
1. INITIAL MIXED RIVER CONDITION	
CBOD5 (mg/L):	3.0
NBOD (mg/L):	5.6
Dissolved Oxygen (mg/L):	6.6
Temperature (deg C):	25.2
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day^-1):	1.20
BOD Decay (day^-1):	0.50
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	4.4
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	10.1
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	8.023
Initial Deficit (mg/L):	1.42
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	0.94
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	42.95
7. CRITICAL DO DEFICIT (mg/L):	2.61
8. CRITICAL DO CONCENTRATION (mg/L):	5.41

Table 3a
Page 4 of 21

Table 3b- Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag during Proposed Conditions
Bayer CropScience, Kansas City, MO

INPUT			
1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			4.3
CBOD5 (mg/L):			67.3
NBOD (mg/L):			79.5
Dissolved Oxygen (mg/L):			7.7
Temperature (deg C):			32.2
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			15323
Upstream CBOD5 (mg/L):			3.0
Upstream NBOD (mg/L):			5.6
Upstream Dissolved Oxygen (mg/L):			6.6
Upstream Temperature (deg C):			25.2
Elevation (ft NGVD):			719
Downstream Average Channel Slope (ft/ft):			0.00015
Downstream Average Channel Depth (ft):			7.6
Downstream Average Channel Velocity (fps):			2.8
3. REAERATION RATE (Base e) AT 20 deg C (day^-1):			1.06
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	1.06
O'Connor and Dobbins	.1 - 1.5	2 - 50	1.04
Owens	.1 - 6	1 - 2	1.01
Tsivoglou-Wallace	.1 - 6	.1 - 2	0.97
4. BOD DECAY RATE (Base e) AT 20 deg C (day^-1):			0.39
Reference			Suggested Value
Wright and McDonnell, 1979			0.39
OUTPUT			
1. INITIAL MIXED RIVER CONDITION			
CBOD5 (mg/L):			3.0
NBOD (mg/L):			5.6
Dissolved Oxygen (mg/L):			6.6
Temperature (deg C):			25.2
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)			
Reaeration (day^-1):			1.20
BOD Decay (day^-1):			0.50
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU			
Initial Mixed CBODU (mg/L):			4.4
Initial Mixed Total BODU (CBODU + NBOD, mg/L):			10.1
4. INITIAL DISSOLVED OXYGEN DEFICIT			
Saturation Dissolved Oxygen (mg/L):			8.023
Initial Deficit (mg/L):			1.42
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):			0.94
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):			42.96
7. CRITICAL DO DEFICIT (mg/L):			2.61
8. CRITICAL DO CONCENTRATION (mg/L):			5.41

Appendix C: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant. Department staff determined that changes must be made to the information contained within these attachments. The following were modified and can be found within the Department's WQAR: the applicant originally applied using Form B for a Minimal Degradation Evaluation, but after analysis of the applicant's submittal, Department staff concluded a No Degradation Evaluation was more appropriate for this review.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WATER QUALITY REVIEW ASSISTANCE/ ANTIDEGRADATION REVIEW REQUEST
PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

For Office Use Only	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED

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

REQUESTER	TELEPHONE NUMBER WITH AREA CODE
Richard Rocha	(816) 242-2793
PERMITTEE / FACILITY NAME	MSOP NUMBER (IF APPLICABLE)
Bayer CropScience LP	0002526
COUNTY	SIC / NAICS CODE
Jackson County	2879 & 2819/325320

REASON FOR REQUEST

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

DESCRIPTION OF PROPOSED ACTIVITY

Bayer plans to increase manufacturing of Fluopyram at the Kansas City facility. The additional Fluopyram manufacturing will increase the net amount of pesticides manufactured. The outfall associated with this activity is Outfall 001. Bayer proposes new technology based effluent limits based on the maximum production rate of the Fluopyram.

FACILITY INFORMATION

METHOD OF BACTERIA COMPLIANCE

☐ Chlorine Disinfection ☐ Ultraviolet Disinfection ☐ Ozone ☑ Not Applicable

WATER QUALITY ISSUES*

No water quality issues have occurred since MSOP No. 0002526 was reissued on July 1, 2018.

*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	NW ¼, NW ¼, Section 29, T50N, R32W, Jackson County	✓	Missouri River
003	SW ¼, SW ¼, Section 29, T50N, R32W, Jackson County	✓	Blue River
004	SW ¼, SW ¼, Section 29, T50N, R32W, Jackson County	✓	Blue 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	2.80	Refer to MSOP No. 0002526	Industrial Wastewater
003	Storm water	N/A	Storm water
004	Storm water	N/A	Storm water

* 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.

SIGNATURE [signature] DATE 3/12/2019

PRINT NAME Richard H. Rocha

EMAIL ADDRESS Richard.Rocha@Bayer.com

TELEPHONE NUMBER WITH AREA CODE (816) 242-2793

Applicant supplied (check all that apply):

- ☑ Fee. See Instructions
- ☐ 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
Telephone: 573-751-1300
Fax: 573-522-9920

MO 780-1893 (12-14) Page 1 of 4

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

ANTIDEGRADATION REVIEW SUMMARY
PATH B: TIER 2 – MINIMAL DEGRADATION

1. FACILITY

NAME	COUNTY
Bayer CropScience LP	Jackson County

2. EXISTING WATER QUALITY SUMMARY

If using your own collected water quality data, submit a copy of the Quality Assurance Project Plan (QAPP) to the Watershed Protection Section for approval and then submit the collected data for their approval prior to Antidegradation submittal. When using existing sources of water quality data (eg. USGS), the Engineering Section will conduct the review. For more detailed information, see the Missouri Antidegradation Implementation Procedure (AIP), Section II.A.1.

Provide all the relevant data and reports for approval by the Watershed Protection Section.

Name of Receiving Stream: Missouri River

Source of Existing Water Quality Data: St. Joseph gage (USGS 06818000); Hermann gage (USGS 06934500); Bayer Outfall 001

Distance of outfall to Existing Water Quality Data sampling location: 327.78 Miles to Herman and 114.22 Miles to St. Joseph

Is outfall upstream or downstream of the sampling location? St. Joseph gage is upstream & Hermann gage is downstream

Date range of the Existing Water Quality Data: Data primarily from 2013-2018, but other date ranges also used (See also Exhibit 4)

What is the design flow of the proposed facility? 4.3 cfs or 2.8 MGD (Qd) - no proposed change from current design flow

Critical Low-Flow Receiving Stream Values	1Q10	7Q10	30Q10
Flow (cfs)	3,033	15,323	4,818

Existing Water Quality and Water Quality Standard for Each Pollutant of Concern

Pollutants of Concern	Concentration* mg/L	Concentration* µg/L	1Q10	7Q10	30Q10	Water Quality Standard
COD	X		See Above	See Above	See Above	See Exhibit 4
BOD	X		See Above	See Above	See Above	See Exhibit 4
Total Suspended Solids (TSS)	X		See Above	See Above	See Above	See Exhibit 4
Total Organic Pesticides (TOP)		X	See Above	See Above	See Above	See Exhibit 4

* Place an X in appropriate box for the concentration units for each Pollutant of Concern

Comments/Discussion:
No new water quality data were collected. Existing data were used from publicly available sources (i.e. USGS gages, Bayer DMR data, etc.)

3. ASSIMILATIVE CAPACITY

Determining the facility assimilative capacity, or FAC, and the segment assimilative capacity, or SAC for each pollutant of concern is explained in detail in the Antidegradation Implementation Procedure, Section II.A.3, and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure, Section II.A. Provide all calculations in the Antidegradation Review Report.

Pollutant of Concern	Facility Assimilative Capacity	New Load		Percent of Facility Assimilative Capacity
	(lbs/day)	(mg/L)	(lbs/day)	(%)
Total Suspended Solids	121,053,801 (avg)	81 (avg)	1,887 (avg)	+0.0001
Total Organic Pesticides	405,131 (avg)	0.11 (avg)	2.6 (avg)	+0.00002
COD	See Tables 3a &3b	345 (avg)	8,000 (avg)	
BOD	See Tables 3a &3b	67 (avg)	1,561 (avg)	

Assimilative capacity summary

Change in FAC is <10%; therefore, degradation is minimal.

See Exhibit 4 for detailed calculations. Tables 3a & 3b referenced above are within Exhibit 4.

Is degradation considered minimal for all pollutants of concern? ☑ Yes ☐ No

Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 10 percent of the SAC according to the Antidegradation Implementation Procedure, Section II.A.3. If yes, an alternatives analysis and a social and economic importance analysis are not required.

Comments/Discussion

Because Outfall 001 is the only discharge applicable to this request and the FAC is <10%, the SAC and FAC are expected to be the same.

4. PROPOSED PROJECT SUMMARY

See Cover letter, WQRA Form, and MDNR and Bayer Antidegradation Applicability Review correspondence.

[REVISION 03 - July 14, 2017]

ATTACHMENT 5
Item 2.50 C of Form C

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC.	
491,050 (A.)	lbs/day	Pesticide Manufacturing - Cyclanilide, Flufenacet, Metribuzin, Propoxycarbazone-sodium, Pyrasulfotole, Tebuconazole, and Tembotrione	001
215,028	lbs/day	Formulation of Chemical Pesticides - Captan, Carbaryl, Chlorpyrifos, Clothianidin, Coumaphos, Cyclanilide, Beta-Cyfluthrin, Cyfluthrin, Cyprosulfamide, Deltamethrin, Dicamba, Dichlorvos, Ethephon, Ethofumesate, Fenamidone, Flubendiamide, Fluopyram, Fluoxastrobin, Flupyradifurone, Flutolanil, Fosetyl-Al, Imidacloprid, Iprodione, Isoxaben, Isoxadifen-ethyl, Isoxaflutole, Metalaxyl, Metribuzin, Oxadiazon, Penflufen, Permethrin, Propiconazole, Prothioconazole, Pyrimethanil, Spirodiclofen, Spiromesifen, Spirotetramat, Tebuconazole, Tembotrione, Tetrachlorvinphos, Thiacloprid, Thiencarbazone-Methyl, Thiodicarb, Thiram, Thiophanate-Methyl, Triadimefon, Trifloxystrobin, Triticonazole	001
23,892	lbs/day	Formulation of Biological Pesticides - Bacillus firmus	001
88,936	lbs/day	Manufacture of Inorganic Compounds - Sodium Hypochlorite	001
62,669	lbs/day	Environmental Pollution Control Equipment - Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	001
296,300 283,667	gals/day (99th %) gals/day (monthly avg. maximum)	Hazardous Waste Combustor - Incineration of aqueous and organic waste in Thermal Oxidizer II	001 & 002
768,377	gals/day	Intermediate Production - Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	001

(A.) Does not include the production of intermediates; which are substantial in number (i.e., many different types) and substantial in pounds produced.

[REVISION 03 - July 14, 2017]

[REVISION 04 - April 5, 2019]

ATTACHMENT 5
Item 2.50 C of Form C

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC.	
576,485 (A.)	lbs/day	Pesticide Manufacturing - Cyclanilide, Flufenacet, Fluopyram, Metribuzin, Propoxycarbazone-sodium, Pyrasulfotole, Tebuconazole, and Tembotrione	001
215,028	lbs/day	Formulation of Chemical Pesticides - Captan, Carbaryl, Chlorpyrifos, Clothianidin, Coumaphos, Cyclanilide, Beta-Cyfluthrin, Cyfluthrin, Cyprosulfamide, Deltamethrin, Dicamba, Dichlorvos, Ethephon, Ethofumesate, Fenamidone, Flubendiamide, Fluopyram, Fluoxastrobin, Flupyradifurone, Flutolanil, Fosetyl-Al, Imidacloprid, Iprodione, Isoxaben, Isoxadifen-ethyl, Isoxaflutole, Metalaxyl, Metribuzin, Oxadiazon, Penflufen, Permethrin, Propiconazole, Prothioconazole, Pyrimethanil, Spirodiclofen, Spiromesifen, Spirotetramat, Tebuconazole, Tembotrione, Tetrachlorvinphos, Thiacloprid, Thiencarbazone-Methyl, Thiodicarb, Thiram, Thiophanate-Methyl, Triadimefon, Trifloxystrobin, and Triticonazole	001
23,892	lbs/day	Formulation of Biological Pesticides - Bacillus firmus and Bacillus thuringiensis	001
88,936	lbs/day	Manufacture of Inorganic Compounds - Sodium Hypochlorite	001
62,669	lbs/day	Environmental Pollution Control Equipment - Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	001
296,300 283,667	gals/day (99th %) gals/day (monthly avg. maximum)	Hazardous Waste Combustor - Incineration of aqueous and organic waste in Thermal Oxidizer II	001 & 002
785,177	gals/day	Intermediate Production - Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	001

(A.) Does not include the production of intermediates; only final step in production of pesticide active ingredient.

[REVISION 04 - April 5, 2019]

[REVISION 04 - June 25, 2019]

ATTACHMENT 5
Item 2.50 C of Form C

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC.	
576,485 (A.)	lbs/day	Pesticide Manufacturing - Cyclanilide, Flufenacet, Fluopyram, Metribuzin, Propoxycarbazone-sodium, Pyrasulfotole, Tebuconazole, and Tembotrione	001
215,028	lbs/day	Formulation of Chemical Pesticides - Captan, Carbaryl, Chlorpyrifos, Clothianidin, Coumaphos, Cyclanilide, Beta-Cyfluthrin, Cyfluthrin, Cyprosulfamide, Deltamethrin, Dicamba, Dichlorvos, Ethephon, Ethofumesate, Fenamidone, Flubendiamide, Fluopyram, Fluoxastrobin, Flupyradifurone, Flutolanil, Fosetyl-Al, Glufosinate-ammonium, Imidacloprid, Iprodione, Isoxaben, Isoxadifen-ethyl, Isoxaflutole, Mesotrione, Metalaxyl, Metribuzin, Oxadiazon, Penflufen, Permethrin, Propiconazole, Prothioconazole, Pyrimethanil, Spirodiclofen, Spiromesifen, Spirotetramat, Tebuconazole, Tembotrione, Tetrachlorvinphos, Tetraniliprole, Thiacloprid, Thiencarbazone-Methyl, Thiodicarb, Thiram, Thiophanate-Methyl, Tioxazafen, Triadimefon, Trifloxystrobin, and Triticonazole	001
23,892	lbs/day	Formulation of Biological Pesticides - Bacillus firmus and Bacillus thuringiensis	001
88,936	lbs/day	Manufacture of Inorganic Compounds - Sodium Hypochlorite	001
62,669	lbs/day	Environmental Pollution Control Equipment - Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	001
296,300 283,667	gals/day (99th %) gals/day (monthly avg. maximum)	Hazardous Waste Combustor - Incineration of aqueous and organic waste in Thermal Oxidizer II	001 & 002
785,177	gals/day	Intermediate Production - Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	001

(A.) Does not include the production of intermediates; only final step in production of pesticide active ingredient.

[REVISION 04 - June 25, 2019]

Table A - Summary of Revised MSOP Permit Limits from Fluopyram Manufacture (¥)

Bayer MSOP Permit No.: MO-0002526 (issued July 1, 2018)

Effluent Parameter (from Table A-1)	Type of Limit in MSOP	Limits Appearing in Current MSOP (7-1-2018)	Delta Change from adding Fluopyram Manufacture	Revised Permit Limits After Permit Modification
Design flow Wastewater Treatment Plant	- - -	2.8 MGD	no change	no change
E. coli	- - -	no change	no change	no change
pH	- - -	no change	no change	no change
Biochemical Oxygen Demand (BOD)	*Daily Maximum* *Monthly Average*	5,994 lbs/day 1,418 lbs/day	+ 649 lbs/day + 143 lbs/day	6,643 lbs/day 1,561 lbs/day
Chemical Oxygen Demand (COD)	*Daily Maximum* *Monthly Average*	10,523 lbs/day 7,224 lbs/day	+ 1,127 lbs/day + 776 lbs/day	11,650 lbs/day 8,000 lbs/day
Total Organic Pesticide Chemicals	*Daily Maximum* *Monthly Average*	7.1 lbs/day 2.5 lbs/day	+ 0.82 lbs/day + 0.14 lbs/day	7.9 lbs/day 2.6 lbs/day
Total Suspended Solids (TSS)	*Daily Maximum* *Monthly Average*	5,776 lbs/day 1,726 lbs/day	+ 546 lbs/day + 161 lbs/day	6,322 lbs/day 1,887 lbs/day
Metribuzin	- - -	no change	no change	no change
Trichloromethane (aka, chloroform)	- - -	no change	no change	no change
Priority Pollutants (from Table A-3)	- - -	no change	no change	no change
Ammonia	- - -	no change	no change	no change

(¥) Revised permit limits presented in this table should be viewed as preliminary since the facility has not yet submitted a permit modification to the MDNR to include Fluopyram's manufacture.

Table B - Derivation of revised BOD Permit Limits from Fluopyram Manufacture

(from page 32 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table B.1 - Current BOD Permit Limits

BOD ELG SECTION	PERMITTEE's VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 manufactures pesticides in lbs/day	491,050	7.4	1.6	pounds per 1000 pounds	3,633.77	785.68
BCT 455.23 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.768377	120	45	8.34	768.99	288.37
SUM					**5,994**	**1,418**

Table B.2 - Revised BOD Permit Limits with Fluopyram Manufacture

BOD ELG SECTION	PERMITTEE's VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 manufactures pesticides in lbs/day	576,485	7.4	1.6	pounds per 1000 pounds	4,265.99	922.38
BCT 455.23 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.785177	120	45	8.34	785.81	294.68
SUM					**6,643**	**1,561**

Excel Spreadsheet
April 2019

Table C - Derivation of revised COD Permit Limits from Fluopyram Manufacture

(from page 33 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table C.1 - Current COD Permit Limits

COD ELG SECTION	PERMITTEE'S VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	491,050	13	9	pounds per 1000 pounds	6,383.65	4,419.45
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.768377	120	45	8.34	768.99	288.37
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %tile daily max; x2.1 monthly average	236.58	496.81
SUM					**10,523**	**7,224**

Table C.2 - Revised COD Permit Limits with Fluopyram Manufacture

COD ELG SECTION	PERMITTEE'S VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	576,485	13	9	pounds per 1000 pounds	7,494.31	5,188.37
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.785177	120	45	8.34	785.81	294.68
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %tile daily max; x2.1 monthly average	236.58	496.81
SUM					**11,650**	**8,000**

Excel Spreadsheet
April 2019

Table D - Derivation of revised Total Organic Pesticides Permit Limits from Fluopyram Manufacture

(from page 34 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table D.1 - Current Total Organic Pesticides Permit Limits

Total Organic Pesticide Chemicals	PERMITTEE'S VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.20 manufacture in lbs/day	491,050	0.01	0.0018	0.001	4.9105	0.88389
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.1**	**2.5**

Table D.2 - Revised Total Organic Pesticides Permit Limits with Fluopyram Manufacture

Total Organic Pesticide Chemicals	PERMITTEE'S VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.20 manufacture in lbs/day	576,485	0.01	0.0018	0.001	5.7649	1.03767
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.9**	**2.6**

Excel Spreadsheet
April 2019

Table E - Derivation of revised TSS Permit Limits from Fluopyram Manufacture

(from page 34 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table E.1 - Current TSS Permit Limits

TSS ELG SECTION	PERMITTEE'S VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 pesticide manufacture in lbs/day	491,050	6.1	1.8	pounds per 1000 pounds	2,995.41	883.89
BPT/BPJ 455.23 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.768377	183	57	8.34	1,172.71	365.27
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**5,776**	**1,726**

Table E.2 - Revised TSS Permit Limits with Fluopyram Manufacture

TSS ELG SECTION	PERMITTEE'S VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 pesticide manufacture in lbs/day	576,485	6.1	1.8	pounds per 1000 pounds	3,516.56	1,037.67
BPT/BPJ 455.23 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.785177	183	57	8.34	1,198.35	373.26
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**6,322**	**1,887**

Excel Spreadsheet
April 2019

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.

VIA CERTIFIED MAIL - 7015 0640 0004 9885 8131
RETURN RECEIPT REQUESTED

June 25, 2019

Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
ATTN: Operating Permits Section
P.O. Box 176
Jefferson City, Missouri 65102-0176

Re: Request for Permit Modification of Missouri State Operating Permitt
Bayer CropScience LP
MSOP No.: MO-0002526

Dear Sir/Madam:

Bayer CropScience LP
8400 Hawthorn Road
Kansas City, MO 64120

The purpose of this letter is to request a modification of Bayer CropScience's above referenced facility's Missouri State Operating Permit (MSOP) wastewater discharge permit. As described below, the facility is seeking the following four changes as part of this permit modification:

1. Revise technology-based effluent limit guidelines (ELG) permit limits for four Outfall 001 effluent parameters to reflect facility's full-scale manufacture of the fungicide Fluopyram

2. Notification that the facility plans to formulate several new pesticide active ingredients (PAI) and is already formulating another PAI

3. Minor modification to a diagram appearing in the facility's MSOP

4. Correct several typographical errors in facility's MSOP and Fact Sheet

A completed Missouri Department of Natural Resources (MDNR) Form A - Application for nondomestic permit under Missouri Clean Water Law (MO 780-1479 (02-19)) and the required facility map are included in Enclosure 1 of this letter. In remittance of the permit modification's filling fee a check in the amount of one thousand two hundred and fifty dollars ($1,250.00) made payable to the MDNR is included in Enclosure 2 of this letter.

1.0 FULL-SCALE MANUFACTURE OF FLUOPYRAM:

1.1 Background:

The new pesticide being manufactured is called Fluopyram. Fluopyram is a fungicide that also exhibits efficacy as a nematode insecticide. Its chemical formula is $C_{16}H_{11}ClF_6N_2O$, its chemical abstract services (CAS) registry name is N-[2-[3-chloro-5-(trifluoromethyl)-2-pyridinyl]ethyl]-2-

(trifluoromethyl)benzamide-, and its CAS number is 658066-35-4. Fluopyram is used on apples, oranges, potatoes, strawberries, sugar beets, wine grapes, and many other crops. A copy of Fluopyram's safety data sheet (SDS) is included in Enclosure 3 of this letter. The manufacture of Fluopyram takes place in the Sencor/FOE Plant at the Kansas City facility. The physical state of the final product is a solid crystalline.

Although the facility just recently began manufacturing Fluopyram at the Kansas City facility, the facility is already familiar with the fungicide since it has been formulating Fluopyram at the facility since 2012.[1.] In addition, a Bayer facility located in Germany has been manufacturing Fluopyram for over six years and from this experience the Kansas City facility has very good knowledge of the expected types and quantities of wastewater to be generated. The new manufacturing process at the Kansas City facility uses similar manufacturing equipment and chemical process steps as the facility in Germany. The only difference of note between the two plants is that the Kansas City facility chemically synthesize two intermediates used in the first few steps of Fluopyram's manufacture, whereas the facility in Germany purchases these intermediates as raw materials from an off-site supplier.

The manufacture of Fluopyram entails seven distinct chemical reactions (i.e., process steps). The steps include: TFMB-Hydroxy, TFMB-Acetate, Py-Malonester, Py-Diester, Py-Na, Decarboxylation, and Fluopyram isolation, drying, and packaging. A list of the chemicals involved in the manufacture of Fluopyram is summarized in Table 1 in Enclosure 4 of this letter.

The following is a simplified description of the seven process steps. First, a reaction takes place to convert TFMB-Amide to TFMB-Hydroxy. Then, the TFMB-Hydroxy is dried and reacted with acetic anhydride in the presence of a catalyst to produce TFMB-Acetate. At the same time as Step 2 is occurring, Py-Cl (2,3,-Dichloro-5-trifluoromethyl pyridine) and Dimethyl malonate are reacted to produce Py-Malonester. Next, the intermediates TFMB-Acetate and Py-Malonester are reacted together to produce Py-Diester. The Py-Diester then undergoes a saponification reaction in the presence of aqueous alkali to produce Py-Na. The mixture undergoes a vacuum to remove organics leaving Py-Na in a methanol-water solution. The solution's pH is then dropped by the addition of hydrochloric acid and the final product Fluopyram is formed. The methanol-water solution containing Flyopyram is then cooled to crystallize the Fluopyram. Finally, the product undergoes two drying steps consisting of centrifuges and conical dryers to remove all remaining methanol and water.

[1.] Formulation refers to the process of mixing, blending, or diluting one or more pesticide active ingredients with one or more active or inert ingredients, without an intended chemical reaction, to obtain a manufacturing use product or an end use product.

1.2 Antidegradation Applicability Review of Fluopyram's Manufacture

The full-scale manufacture of Fluopyram will not result in the degradation of the water quality of the Missouri River.

1.2.1 Reduced Manufacture Rate of Fluopyram:

The MDNR performed an Antidegradation Applicability Review of the facility's manufacture of Fluopyram at a reduced manufacturing rate and determined that the resulting discharge was not subject to antidegradation review. Upon receipt of this finding, the facility began manufacturing Fluopyram at a reduced rate in early December 2018. A copy of MDNR's transmittal letter of this determination to Bayer dated November 30, 2018 is included in Enclosure 5 of this letter. Only the transmittal letter is being provided, and not the letter's enclosure, for brevity.

1.2.2 Full-Scale Manufacture Rate of Fluopyram:

Bayer submitted a minimal degradation antidegradation applicability review package to the MDNR for the full-scale manufacture of Fluopyram on March 12, 2019. The MDNR performed a Missouri Antidegradation Rule and Implementation Procedure (AIP) analysis and issued the facility a Water Quality and Antidegradation Review Preliminary Determination for the proposed discharge. A copy of MDNR's letter used to transmit the preliminary determination report to Bayer dated May 6, 2019 is included in Enclosure 6 of this letter. Only the transmittal letter is being provided for the sake of brevity and not the letter's 23-page long enclosure.

The Fluopyram production rates included in this permit modification submittal are identical to the production rates included in Bayer's March 12, 2019 submittal that were used by the MDNR to perform the AIP analysis of the facility's full-scale manufacture of Fluopyram. Furthermore, as explained below in full in Section 1.4, the ELG permit limit changes presented in this permit modification are identical as presented in Bayer's March 12 letter. Finally, the design flow of Outfall 001 will remain unchanged at 2.80 million gallons per day (MGD).

1.3 Increased Pesticide Manufacturing Rate:

The forecasted full-scale manufacturing rate of Fluopyram is 28,535,294 pounds per year (lbs/year). Production is planned to occur 11 months per year with one month shutdown to perform equipment inspections, maintenance, process improvements, repairs, etc. Assuming there are 334 days in the 11 month manufacturing period, the forecasted annual rate equates to a daily manufacturing rate of 85,435 pounds per day (lbs/day). As is typically done, the facility began manufacturing

Fluopyram at a reduced manufacturing rate in December 2018 as the utilization rate of the new process equipment is gradually increased and optimized.

The addition of Fluopyram manufacturing increases the net amount of pesticides manufactured by the facility and also increases the amount of wastewater generated. Specifically, the long-term pesticide manufacturing rate used to derive pesticide manufacturing technology-based ELG permit limits will increase by 85,435 lbs/day. Furthermore, an additional 24,000 gallons/day of process wastewater will be generated; and of this total approximately 16,800 gallons/day (about 70%) will be from the manufacture of intermediates and 7,200 gallons/day will be from the process step producing Fluopyram. This increase in wastewater still maintains the facility's discharge rate well below the design flow rate of 2.80 MGD.

Given that the facility's MSOP was renewed less than a year ago on July 1, 2018, an assumption has been made that it is acceptable to use the production data used as part of MSOP's renewal application to derive a new long-term average organic pesticide manufacturing rate that includes the full-scale Fluopyram production. Manufacturing data used for the facility's recent MSOP renewal was presented in Attachment 5 of the permit renewal application. A copy of Attachment 5 used to derive ELG permit limits appearing in the July 1, 2018 MSOP is included in Enclosure 7 of this letter. The current Attachment 5 is identified as revision 3 and is dated July 14, 2017.

The following two paragraphs describe the changes the facility has made to Attachment 5 to include Fluopyram's full-scale manufacture. The long-term pesticide manufacturing rate used to derive organic pesticide manufacturing technology-based effluent limits appearing the facility's MSOP will increase from the previous rate of 491,050 lbs/day by an additional 85,435 lbs/day to a new production rate of 576,485 lbs/day. To reflect this change, the amount of Pesticides Manufactured appearing in Column 1.A., of Row 1, of Attachment 5 has been changed to 576,485 lbs/day. Also, the name Fluopyram has been added to the list of pesticides manufactured appearing in Column 1.C., of Row 1, of Attachment 5.

In addition, Attachment 5 was revised to include the additional 16,800 gallons/day of wastewater generated by intermediate production to make Fluopyram. To reflect this change, the Quantity Per Day of wastewater appearing in Column 1.A., of Row 7, of Attachment 5 was increased from 768,377 gallons/day to 785,177 gallons/day.

A copy of revised Attachment 5 is included in Enclosure 8 of this letter. To avoid future confusion between previous versions, the phrase "[REVISION 4 - June 25, 2019]" has been conspicuously added to the header and footer of Attachment 5.

1.4 Impact of Fluopyram's Manufacture on MSOP Permit Limits:

The manufacture of Fluopyram will have a minor impact on a few of the ELG based permit limits appearing in the facility's MSOP for Outfall 001. Using above discussed revised Attachment 5's updated production data, and the calculation methods appearing in the Fact Sheet of the facility's MSOP, the facility performed an analysis to identify changes to four technology-based permit limits. The four affected parameters include: Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Organic Pesticide Chemicals, and Total Suspended Solids (TSS). A summary of the permit limit changes based on this analysis is presented in Table 2 in Enclosure 9 of this letter. Details on the derivation of new *daily maximum* and *monthly average* permit limits for each of the four parameters is included in the following four tables (see Enclosure 10):

- Biochemical Oxygen Demand (BOD) ..... see Table 3
- Chemical Oxygen Demand (COD) ..... see Table 4
- Total Organic Pesticide Chemicals ..... see Table 5
- Total Suspended Solids (TSS) ..... see Table 6

Using the updated production data in revised Attachment 5, and the building block method for technology-based effluent limitations used in the permit's Fact Sheet, revised ELG permit limits were generated for each of these parameters. Calculations showing the derivation of each parameter's revised *daily maximum* and *monthly average* permit limits are presented in a standalone table for each parameter, as indicated in the above bullet list. Each table includes two sub-tables that are organized to match the format and content of the ELG tables appearing in the Fact Sheet of the facility's MSOP. The top sub-table, identified with the number ".1," presents a near exact copy of the parameter's permit derivations from the Fact Sheet. The second sub-table, designated with the number ".2," presents the calculations of the parameter's new permit limits using revised Attachment 5's production data. For example for BOD, sub-table 3.1 shows how BOD permit limits are derived in the facility's current MSOP and sub-table 3.2 shows the revised BOD permit limit calculations using the increase from the manufacture of Fluopyram.

1.5 Treatment of Wastewater Discharge:

The manufacture of Fluopyram will result in minimal changes in the wastewater that the facility discharges through Outfall 001, and will not cause a violation of any effluent limitations specified in the facility's MSOP wastewater permit, especially after the facility's MSOP's ELG limits are updated to account for the increased loading from Fluopyram's manufacture.

The change in effluent discharge will be minor because of the treatment effectiveness of the facility's wastewater treatment plant, the types and quantities of chemicals used in the Fluopyram process will be

manageable and are similar to those already handled at the facility, and the minimal increase in wastewater generation. In addition, bench scale respirometer testing of Fluopyram wastewater has demonstrated that the wastewater is generally amenable to biological treatment, does not inhibit biological activity, and is not toxic to the facility's wastewater treatment plant's biological activated sludge reactors. The facility therefore anticipates being able to effectively treat wastewater generated from the full-scale production of Fluopyram in the facility's existing wastewater treatment plant. Organic parameters will be present after treatment at low concentrations that will not violate any effluent limitations or conditions of the MSOP. Because the physical state of the final Fluopyram product is a solid, the amount of Fluopyram ending up in the facility's treated effluent is expected to be trace amounts or possibly non-detected. The facility's wastewater effluent Outfall 001 will be sampled for the presence of Fluopyram per the terms of the facility's MSOP, and if detected, will count towards the *daily maximum* and *monthly average* permit limits for the effluent parameter "Total Organic Pesticide Chemicals." The design flow of the facility's wastewater treatment plant will remain 2.80 MGD.

1.6 Schedule:

The first campaign to manufacture Fluopyram at a reduced rate began the first week of December 2018. Since then the facility has been gradually ramping up the production rate each month with the goal to obtain full-scale production rate by the end of June 2019. During this time, and until the MSOP is modified to include new ELG permit limits, the facility will continue to comply with the terms and conditions of the facility's existing MSOP.

2.0 FORMULATION OF NEW PESTICIDE ACTIVE INGREDIENTS:

The facility would like to take this opportunity to also update Attachment 5 to include five new pesticides that the facility is, or plans to formulate in the near future. The additions include four chemical pesticides and one biological pesticide. The new chemical pesticides are Glufosinate-ammonium, Mesotrione, Tetraniliprole, and Tioxazafen. Note the facility is already formulating Glufosinate-ammonium; it was inadvertently not included on the previously submitted version of Attachment 5. The name of the biological pesticide added to Attachment 5 is Bacillus thuringiensis. The facility will only be repackaging this pesticide and not formulating it. For wastewater permit compliance purposes the facility has historically treated the packaging and repackaging of pesticides the same as formulated pesticides.

Attachment 5 has been revised as follows to add the above described five formulated pesticides. First, the four chemical pesticides were inserted in alphabetical order to the existing list appearing in Column 1.C, of Row 2 of Attachment 5. No changes were made to the formulation rates (i.e., lbs/day) of chemical pesticides formulated at the facility. For the second formulation

revision to Attachment 5, the new biological pesticide's name has been added to Column 1.C., of Row 3. No change has been made to the formulation rate of biological pesticides formulated at the facility.

Per the terms and conditions of the facility's current MSOP, the facility's wastewater effluent Outfall 001 will be sampled for the presence of each of the chemical pesticides, and if detected, will be counted towards the *daily maximum* and *monthly average* permit limits for the effluent parameter "Total Organic Pesticides Chemicals" for permit compliance determination purposes.

Regarding the inclusion of the additional formulated pesticides in this permit modification, it is the facility's position that the formulation of a new pesticide at the facility, or the cessation of the formulation a pesticide already being formulated, will not typically require a formal permit modification be submitted to the MDNR for the activity to occur. Instead, it is the facility's position that a permit modification notice to formulate a new pesticide would only be required when one or more of the following four criteria are met: i.) new pesticide would result in an increase by more than 20% in the formulation rate of pesticides; ii.) stopping formulation of an existing pesticide would result in a decrease by more than 20% in the formulation rate of pesticides; iii.) formulation of new pesticide would result in an increase in design flow of facility's wastewater treatment plant which is currently 2.8 million gallons per day; or iv.) formulation of a new class of pesticides not similar to pesticides already formulated or manufactured at the facility. For illustration purposes, an example of a new class of pesticide that would require a permit modification would be if the facility were to formulate a copper-based pesticide for the first time as the facility currently does not formulate or manufacture copper-based pesticides. Separate and apart from permit modification requirements, the facility would still be subject to the notification requirements if the new pesticide to be formulated will result in the discharge of a toxic pollutant which is not limited in the facility's MSOP, and the resulting discharge exceeds any of the notification levels found in Special Condition D.13 of the facility's MSOP or Standard Conditions Part I, Section B, subsection 1.

In the future, with MDNR's concurrence, a pesticide formulation permit modification will only be submitted to the MDNR when one or more of the above four criteria are met.

3.0 REQUEST TO MODIFY MSOP DIAGRAM:

The third change the facility is seeking as part of this permit modification is to slightly modify an existing diagram appearing in the facility's MSOP. The diagram is identified as Enclosure C and depicts a simplified process flow diagram of the facility's wastewater treatment plant. The Enclosure C diagram appears on page 10 of 13 of the facility's MSOP.

Bayer kindly requests that two existing wastewater tanks associated with the facility's OP Plant be added to this diagram. Both tanks, and the sumps that

discharge to them, have been used for many years to manage wastewater generated from pesticide/herbicide manufacturing process equipment in the OP Plant. Inclusion of the wastewater tanks on the diagram will eliminate potential ambiguity regarding each tanks' use/purpose and will improve regulatory certainty for the facility. The tanks' equipment identification numbers are Tank 14.1-B3 and Tank 14.0-B2 and each tank has a design capacity of 13,095 gallons.

3.1 Wastewater Tank 14.1-B3:

This tank collects wastewater from herbicide manufacturing process equipment, and pollution control equipment (e.g., scrubbers), in the OP Plant. The tank's discharge almost always undergoes point source treatment prior to discharge to the overhead process sewer to the site-wide wastewater treatment plant. The point source treatment consists of passing the wastewater through an activated carbon adsorption column. The point source treatment is performed given the known high pollutant loading of the wastewater and the effectiveness of the activated carbon in decreasing this loading. Alternatively, the discharge from Tank 14.1-B3 could be routed to the overhead process sewer without point source treatment if the amount of pollutants present in the wastewater were low enough to not warrant point source treatment.

3.2 Wastewater Tank 14.0-B2:

This tank is also used to collect wastewater from herbicide manufacturing process equipment in the OP Plant. The tank's discharge can be managed in two different ways. Typically Tank 14.0-B2 operates in a zero discharge mode with all collected wastewater incinerated and no discharge to the process sewer. The facility typically operates the tank in zero discharge mode out of an abundance of caution since the wastewater has the potential to contain high concentrations of herbicides. The wastewater is not amenable to point source treatment by activated carbon because of the wastewater's high salinity and herbicide's miscibility in the salty water. Alternatively, when not operated in zero discharge, the discharge from Tank 14.0B2 could be sent to the site-wide wastewater treatment plant.

Regarding this change the facility is only requesting that the Enclosure C diagram be modified. No other changes are requested to the diagram, text of the MSOP, or the permit's Fact Sheet.

A copy of the revised Enclosure C process flow diagram showing the two tanks, point source treatment carbon adsorption column, and meaning of acronym T.O. II added to diagram's key is included in Enclosure 11 of this letter. The two tanks are located in the top left corner of the diagram. No other process or equipment changes have been made to the diagram. The modified diagram is identified as revision 5 and is dated June 25, 2019. In addition, a computer flash drive containing high resolution electronic version

of the revised diagram in Adobe and MS PowerPoint formats are provided in Enclosure 12.

4.0 TYPOGRAPHICAL ERRORS IN FACILITY'S MSOP:

In the course of preparing this permit modification request several typographical errors were identified in the facility's MSOP and Fact Sheet. The facility is bringing them to MDNR's attention at this time since it seems it would be an efficient time to make the corrections at the same time the permit is being modified to make other changes.

4.1 (Page 5 of 13, MSOP) There is a date error on the bottom of page 5 of 13 in Section A of the facility's MSOP. Specifically, the bottom of page 5 states that the deadline for the facility to submit results of Table A-3 priority pollutant monitoring in units of pounds per day (lbs/day) is January 28, 2018. This deadline is clearly an error as it occurred before the date that the facility's MSOP was renewed; which was July 1, 2018. A copy of page 5 of the facility's MSOP that has been marked up to show the location of the date error is included in Enclosure 13 of this letter.

The facility believes that the correct reporting date is January 28, 2019 as this is the date appearing on page 6 of the facility's MSOP which is the reporting deadline for the facility to submit Table A-4 priority pollutant monitoring results in concentration units of micrograms per liter (ug/L).

4.2 (Page 15 of 62, Fact Sheet) - The table titled "ELG Table 1: Maximum Production: Form C - Item 2.50" of the Fact Sheet includes a very minor typographical error in the second row of the table. Specifically, the third column of the second row includes the following statement in parentheticals "(value does not include intermediated)." To be more technically correct, the word "intermediated" should instead be "intermediates." A copy of page 15 of the Fact Sheet that has been marked up to show the location of the typographical error is included in Enclosure 13 of this letter.

4.3 (beginning on Page 32 of 62, Fact Sheet) - The facility is not sure if this is a typographical error or an opportunity to better clarify the appropriate ELG for effluent parameters BOD and TSS for Outfall 001. For these two parameters several inconsistencies have been identified regarding the Fact Sheet's applicability references to technology-based effluent limits best practicable control technology currently available (BPT) and best conventional pollutant control technology (BCT), and their corresponding regulatory citations §455.22 (i.e., for BPT) and §455.23 (i.e., for BCT). The potential issues are limited to just BOD and TSS. No issues were identified for the parameters COD and Total Organic Pesticide Chemicals.

Note that the purpose of this comment is administrative clarity only, since the BPT and BCT designation does not impact the derivation of BOD or TSS's permit limits because the ELG factors are the same for both BPT and BCT. For example, the BPT daily allowance factor for BOD

under §455.22 is 7.4 pounds per 1000 pounds, which is identical to BCT's daily allowance factor of 7.4 pounds per 1000 pounds under §455.23.

4.3.1 BOD:

Under the section heading "ELG Requirements" from the previous page, the Fact Sheet on page 32 of 62 presents the derivation of BOD's ELG under a paragraph titled "§455.22 - ELG: Effluent limitations guidelines representing the degree of effluent reductions attainable by the application of the best practical control technology currently available." The abbreviation BPT is defined in the first sentence of the paragraph. The title and text of the paragraph only make reference to BPT and its corresponding regulatory citation §455.22.

However, under subsequent sub-paragraph titled "Biochemical Oxygen Demand (BOD_5)," there is no mention of BPT or §455.22 in the text, but instead the regulation §455.23 is cited. Furthermore, in the BOD table on the top of next page (page 33 of 62), the statement "BPT 455.23 . . ." appears in column 1, row 2. The cited regulation does not match BPT. The table's text should either be "BPT 455.22 . . ." or "BCT 455.23 . . ." It is suggested that the text and table be revised to consistently apply BPT and the correct regulatory citation.

4.3.2 TSS:

The Fact Sheet on page 34 of 62 presents the derivation of TSS's ELG. The TSS sub-paragraph falls under the same ELG section heading as described above for BOD; which only makes reference to BPT and its regulation §455.22. In the section of the Fact Sheet specifically pertaining to TSS, the text includes no mention of BPT or §455.22. However, in the TSS table on the top of the next page (page 35 of 62), the statement "BPT 455.23 . . ." appears in column 1, row 2. Similar to BOD's table, there is something incorrect with this statement since it combines abbreviation BPT with regulatory citation for BCT. The cited level of effluent guideline control required does not match the correct regulatory citation. The table's statement should be either "BPT 455.22 . . .", or "BCT 455.23 . . ." It is suggested that the text and table be revised to consistently apply BPT and the correct regulatory citation.

Again, there appears to be no substantive impact of applying BPT or BCT to BOD and TSS ELG control level, since both will result in identical permit limits. The facility is nevertheless bringing the noted observations to MDNR's attention to improve the accuracy of the Fact Sheet.

4.4 (Page 33 of 62, Fact Sheet) - The table on the top of page 33 of the Fact Sheet summarizes the derivation of ELG permit limits for BOD. The third

row of the table derives BOD contributions from the facility's formulation of chemical pesticides. The current text in row three, column one, states "BCT 455.23 formulates pesticides in lbs/day."

It is suggested that the text in this cell (3rd row, 1st column) be slightly revised to improve its accuracy and clarity. Specifically, it is recommended that the text be slightly revised to read "BPT/BPJ 455.22 formulates pesticides in lbs/day." Changing the abbreviation from BCT to BPT, and adding the acronym BPJ (best professional judgment) makes the text more accurate. The suggested change will also make the table's text consistent with how pesticide formulation is accounted for in deriving COD, Total Organic Pesticide Chemicals, and TSS in subsequent tables in the Fact Sheet.

Current text appearing in this cell (3rd row, 1st column):

BCT 455.23 formulates pesticides in lbs/day	215.028

If the BOD table's cell in question is revised as suggested, it would read:

BPT/BPJ 455.22 formulates pesticides in lbs/day	215.028

4.5 (Page 34 of 62, Fact Sheet) - Under sub-paragraph section heading Total Suspended Solids (TSS) of the Fact Sheet, the second sentence mistakenly includes the acronym COD. The correct acronym is TSS given that TSS is the topic of this section of the Fact Sheet. A copy of page 34 of the Fact Sheet that has been marked up to show the location of the typographical error is included in Enclosure 13 of this letter.

4.6 (Page 35 of 62, Fact Sheet) - The table on the top of page 35 of the Fact Sheet summarizes the derivation of ELG permit limits for TSS. The third row of the table derives TSS contributions from the facility's formulation of chemical pesticides. The current text in row three, column one, states "BPT/BPJ 455.23 formulates pesticides in lbs/day." There is an opportunity to improve the accuracy of the current text in this cell since the cited regulation "455.23" does not match the cited level of control "BPT." The regulation 455.23 is for BCT control. It is suggested that the text be slightly changed to the regulation to 455.22. If the regulation is revised, the cell's text would read "BPT/BPJ 455.22 formulates pesticides in lbs/day."

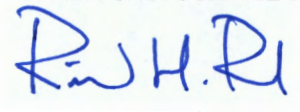
As mentioned above, Enclosure 12 of this letter includes a computer flash drive containing a high resolution electronic version of revised process flow diagram. The flash drive also includes a complete electronic copy of this letter, and the letter's

enclosures, in Adobe format. In addition, the flash drive includes electronic copies of select enclosures in MS Word and Excel formats.

In closing, thank you in advance for your consideration of the four changes requested by this permit modification. Please contact me at (816) 242-2793, or via email at Richard.Rocha@Bayer.com, if you have any questions or if you need any additional information.

Sincerely,

BAYER CROPSCIENCE LP



Richard H. Rocha
Principal Environmental Engineer

Enclosures:
1.) MDNR Form A (MO 780-1479 (02-19)) and facility map
2.) Remittance check in amount of $1,250 dated June 21, 2019
3.) Safety Data Sheet (SDS) for Fluopyram
4.) Table 1 - List of Chemicals Fluopyram Manufacturing Process
5.) MDNR Antidegradation letter to Bayer dated November 30, 2018 *(transmittal letter only)*
6.) MDNR Antidegradation preliminary letter to Bayer dated May 6, 2019 *(transmittal letter only)*
7.) Copy of Attachment 5 to Item 2.50C of Form C of facility's Permit Renewal Application [REVISION 03 - July 14, 2017]
8.) Revised Attachment 5 to Item 2.50C of Form C of facility's Permit Renewal Application [REVISION 04 - June 25, 2019]
9.) Table 2 - Summary of Changes to MSOP Permit Limits
10.) Derivation of New Permit Limits in Table 3, Table 4, Table 5, and Table 6
11.) Revised Enclosure C process flow diagram of wastewater treatment plant [REVISION 05 - June 25, 2019]
12.) Computer flash drive containing electronic copy of this submittal and version of revised diagram.
13.) Copy of marked up page 5 of facility's MSOP showing location of typographical error

cc: David E. Cockrill, Bayer CropScience
Nathan A. Kimmerle, Bayer CropScience
Rob K. Morrison, P.E., Barr Engineering
Paul E. Nagy, Bayer CropScience

ENCLOSURE 1

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

AP32956

RECEIVED
JUN 28 2019
Water Protection Program

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 4232	
DATE RECEIVED 6-28-19	FEE SUBMITTED $50.00 SB
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 – 0002526 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	
Bayer CropScience LP		(816)242-2000	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
8400 Hawthorne Road	Kansas City	MO	64120

3. OWNER

NAME		TELEPHONE NUMBER WITH AREA CODE	
Bayer CropScience LP		(314) 694-1000	
EMAIL ADDRESS			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
800 North Lindbergh Boulevard	St. Louis	MO	63167

4. CONTINUING AUTHORITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
Bayer CropScience LP		(816) 242-2793	
EMAIL ADDRESS			
Richard.Rocha@Bayer.com			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
8400 Hawthorne Road	Kansas City	MO	64120

5. OPERATOR CERTIFICATION

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE	
Not applicable per form instructions			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE NUMBER WITH AREA CODE
Richard H. Rocha	Principal Environmental Eng.	(816) 242-2793
E-MAIL ADDRESS		
Richard.Rocha@Bayer.com		

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

NAME			
AK Steel Corporation			
ADDRESS	CITY	STATE	ZIP CODE
7001 Winner Road	Kansas City	MO	64125

8. ADDITIONAL FACILITY INFORMATION

8.1 Legal Description of Outfalls. (Attach additional sheets if necessary.) *** See Next Page for Outfall 005**

For Universal Transverse Mercator (UTM), use Zone 15 North referenced to North American Datum 1983 (NAD83)

001 NE ¼ NW ¼ Sec 29 T 50N R 32W 095 _____ County
UTM Coordinates Easting (X): 372892 Northing (Y): 4332264

002 NE ¼ SW ¼ Sec 29 T 50N R 32W 095 _____ County
UTM Coordinates Easting (X): 372509 Northing (Y): 4331397

003 SW ¼ SW ¼ Sec 29 T 50N R 32W 095 _____ County
UTM Coordinates Easting (X): 372495 Northing (Y): 4331271

004 SW ¼ SW ¼ Sec 29 T 50N R 32W 095 _____ County
UTM Coordinates Easting (X): 372492 Northing (Y): 4331260

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. Facility manages sludge from wastewater treatment plant by disposal at offsite landfill and offsite incineration. Therefore, Form R does not apply.

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: potable water from City of Kansas City

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
Paul E. Nagy, Head of Kansas City Site	(816) 242-2516
SIGNATURE	DATE SIGNED
	06/25/2019

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)

005 NE ¼ NW ¼ Sec 29 T 50N R 32W 095 County

UTM Coordinates Easting (X): 372409 Northing (Y): 4331283

¼ ¼ Sec T R County

UTM Coordinates Easting (X): Northing (Y):

¼ ¼ Sec T R County

UTM Coordinates Easting (X): Northing (Y):

¼ ¼ Sec T R County

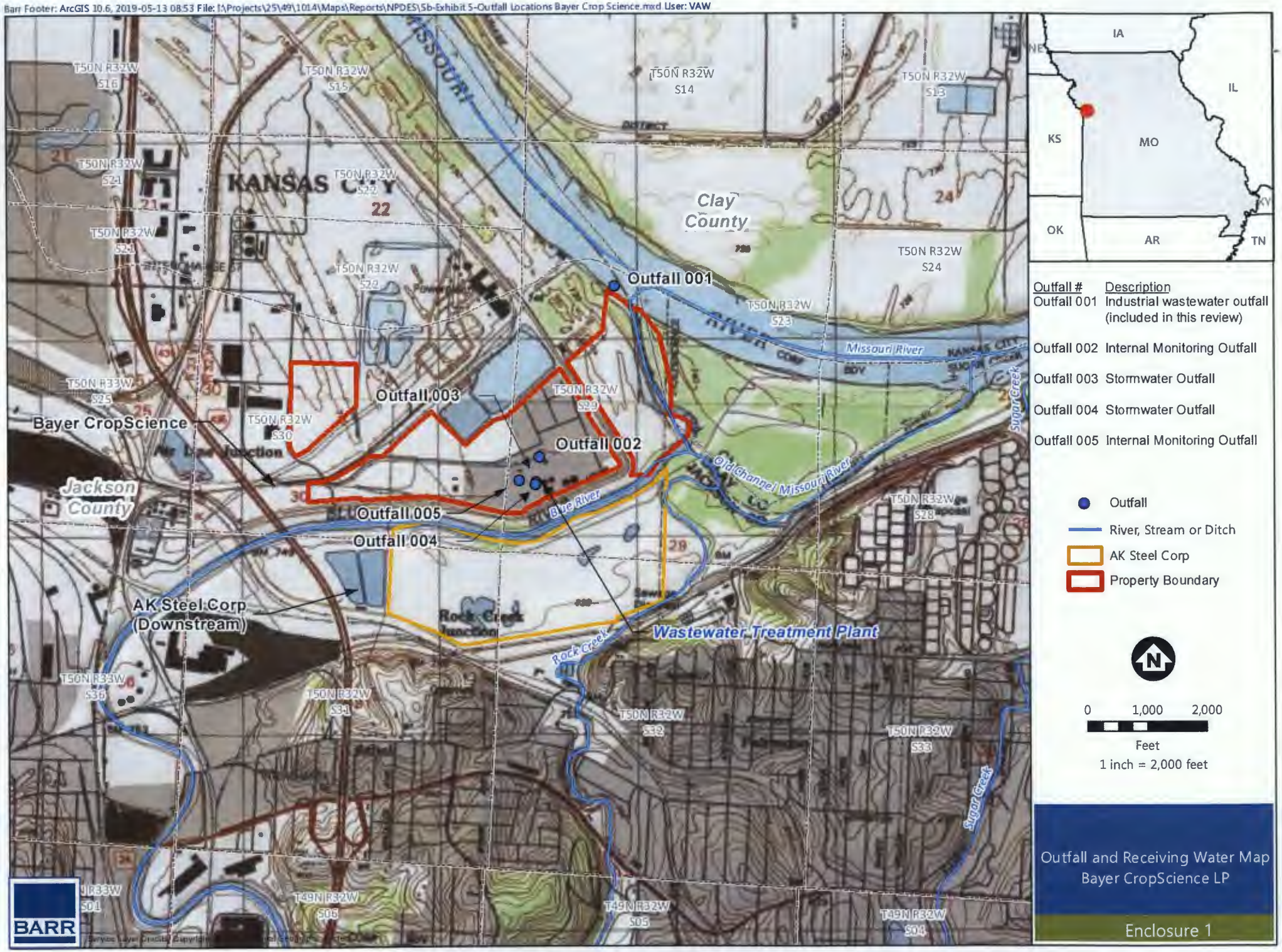
UTM Coordinates Easting (X): Northing (Y):

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

Primary SIC and NAICS SIC and NAICS

SIC and NAICS SIC and NAICS

Barr Footer: ArcGIS 10.6, 2019-05-13 08:53 File: I:\Projects\25\49\1014\Maps\Reports\NPDES\5b-Exhibit 5-Outfall Locations Bayer Crop Science.mxd User: VAW



Outfall #	Description
Outfall 001	Industrial wastewater outfall (included in this review)
Outfall 002	Internal Monitoring Outfall
Outfall 003	Stormwater Outfall
Outfall 004	Stormwater Outfall
Outfall 005	Internal Monitoring Outfall

- Outfall
- River, Stream or Ditch
- AK Steel Corp
- Property Boundary

Outfall and Receiving Water Map
Bayer CropScience LP

Enclosure 1

ENCLOSURE 2

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

ENCLOSURE 3

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

Bayer CropScience

Safety Data Sheet
FLUOPYRAM TECHNICAL

SDS Number: 102000017196
SDS Version 1.3
Revision Date: 06/29/2012
Print Date: 06/29/2012

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name	FLUOPYRAM TECHNICAL
Chemical Name	FLUOPYRAM TECHNICAL
Common Name	fluopyram
SDS Number	102000017196
Product code (UVP)	79261500, 06095355
Chemical Formulation	C16H11CLF6N2O
EPA Registration No.	264-1077
Product Use	Fungicide

Bayer CropScience
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
USA

For MEDICAL, TRANSPORTATION or other EMERGENCY call: 1-800-334-7577 (24 hours/day)
For Product Information call: 1-866-99BAYER (1-866-992-2937)

SECTION 2. HAZARDS IDENTIFICATION

NOTE: Please refer to Section 11 for detailed toxicological information.

Emergency Overview	Caution! Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes and clothing. Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before re-use.
Physical State	crystalline
Odor	characteristic
Appearance	white to grey-beige
Exposure routes	Ingestion, Skin Absorption, Eye contact, Inhalation
Immediate Effects	
Eye	May cause slight irritation. Avoid contact with eyes.
Skin	Harmful if absorbed through skin. Avoid contact with skin and clothing.
Ingestion	Harmful if swallowed. Do not take internally.
Inhalation	Avoid breathing dust.

Chronic or Delayed Long-Term	This product or its components may have long term (chronic) health effects. This product or its components may have target organ effects.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Average % by Weight
Fluopyram	658066-35-4	98.60

SECTION 4. FIRST AID MEASURES

General	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Eye	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.
Skin	Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Call a physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Notes to physician Treatment	There is no specific antidote. Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended.

SECTION 5. FIRE FIGHTING MEASURES

Flash point	not applicable
Autoignition temperature	no data available
Lower Flammability Limit	no data available
Upper Flammability Limit	no data available

Explosiveness	no data available
Fire and Explosion Hazards	In the event of fire the following may be released: Hydrogen chloride (HCl) Hydrogen cyanide (hydrocyanic acid) Hydrogen fluoride Carbon monoxide (CO) Nitrogen oxides (NOx)
Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	High volume water jet
Fire Fighting Instructions	Contain the spread of the fire-fighting media. Do not allow run-off from fire fighting to enter drains or water courses. Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing. In the event of fire and/or explosion do not breathe fumes.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Remove all sources of ignition. Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.
Methods for cleaning up	Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations.
Additional advice	Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal.

SECTION 7. HANDLING AND STORAGE

Handling procedures	Use only in area provided with appropriate exhaust ventilation. Keep away from heat and sources of ignition.
Storing Procedures	Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Store in a place accessible by authorized persons only. Keep away from direct sunlight. Keep away from food, drink and animal feedingstuffs.
Work/Hygienic	Wash hands thoroughly with soap and water after handling and before eating,

Procedures	drinking, chewing gum, using tobacco, using the toilet or applying cosmetics. Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General Protection	Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry. Follow all label instructions. Train employees in safe use of the product.
Eye/Face Protection	Chemical resistant goggles must be worn.
Hand protection	Chemical resistant nitrile rubber gloves
Body Protection	Wear long-sleeved shirt and long pants and shoes plus socks.
Respiratory protection	When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white to grey-beige
Physical State	crystalline
Odor	characteristic
pH	ca. 6.6 (1 %) suspension in water
Vapor Pressure	0.0000012 Pa at 20 °C
Vapor Density (Air = 1)	not applicable
Evaporation rate	no data available
Boiling Point	not applicable
Melting / Freezing Point	119 °C / 246 °F

Water solubility	16 mg/l at 20 °C: measured at pH 7
Minimum Ignition Energy	no data available
Molecular Weight	396.7 g/mol
Decomposition temperature	> 300 °C , Heating rate: 3 K/min Determined in glass.
Partition coefficient: n-octanol/water	log Pow: 3.3
Viscosity	not applicable

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	Heat, flames and sparks.
Incompatibility	no data available
Hazardous reactions	No hazardous reactions when stored and handled according to prescribed instructions.
Chemical Stability	Stable under recommended storage conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	rat: LD50: > 2,000 mg/kg
Acute dermal toxicity	rat: LD50: > 2,000 mg/kg
Acute inhalation toxicity	rat: LC50: > 5.1 mg/l Exposure time: 4 h Determined in the form of dust. rat: LC50: > 20.4 mg/l Exposure time: 1 h Extrapolated from the 4 hr LC50. Determined in the form of dust.
Skin irritation	rabbit: No skin irritation
Eye irritation	rabbit: Slight irritant effect - does not require labelling.
Sensitisation	mouse: Non-sensitizing. OECD Test Guideline 429, local lymph node assay (LLNA)
Chronic toxicity	Fluopyram caused specific target organ toxicity in experimental animal studies

in the following organ(s): liver.

Assessment Carcinogenicity
Fluopyram caused at high dose levels an increased incidence of tumours in rats in the following organ(s): liver.

Fluopyram caused at high dose levels an increased incidence of tumours in mice in the following organ(s): thyroid.

The tumours seen with Fluopyram were caused through a non-genotoxic mechanism, which is not relevant at low doses.

ACGIH
None.
NTP
None.
IARC
None.
OSHA
None.

Reproductive toxicity	Fluopyram caused reproduction toxicity in a two-generation study in rats only at dose levels also toxic to the parent animals. The reproduction toxicity seen with Fluopyram is related to general toxicity.
Developmental Toxicity	Fluopyram caused developmental toxicity only at dose levels toxic to the dams. The developmental effects seen with Fluopyram are related to maternal toxicity.
Mutagenicity	Fluopyram was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity to fish	Rainbow trout (Oncorhynchus mykiss) LC50: > 2 mg/l Exposure time: 96 h No acute toxicity was observed at its limit of water solubility.
Toxicity to aquatic plants	Pseudokirchneriella subcapitata Growth rate EC50: 8.9 mg/l Exposure time: 72 h
Acute Toxicity to Aquatic Invertebrates	Water flea (Daphnia magna) EC50: > 20 mg/l Exposure time: 48 h No acute toxicity was observed at its limit of water solubility.

Environmental precautions	Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other water unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not allow to get into surface water, drains and ground water. For guidance, contact your State Water Board or Regional Office of the EPA. If spillage enters drains leading to sewage works inform local water company immediately.

SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal Guidance	Do not contaminate water, food, or feed by disposal. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.
Container Disposal	Do not re-use empty containers. Triple rinse containers. Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or incineration, or if allowed by State and Local authorities, by burning. If burned, stay out of smoke. Follow advice on product label and/or leaflet.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14. TRANSPORT INFORMATION

49CFR	Not dangerous goods / not hazardous material
IMDG	
UN number	**3077**
Class	9
Packaging group	III
Marine pollutant	YES
Description of the goods	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (FLUOPYRAM)
IATA	
UN number	**3077**
Class	9
Packaging group	III
Environm. Hazardous Mark	YES
Description of the goods	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (FLUOPYRAM)

This transportation information is not intended to convey all specific regulatory information relating to this

product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15. REGULATORY INFORMATION

EPA Registration No. 264-1077

US Federal Regulations

TSCA list
None.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
None.

SARA Title III - Section 302 - Notification and Information
None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting
None.

US States Regulatory Reporting

CA Prop65
This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients
None.

Canadian Regulations

Canadian Domestic Substance List
None.

Environmental

CERCLA
None.

Clean Water Section 307 Priority Pollutants
None.

Safe Drinking Water Act Maximum Contaminant Levels
None.

SECTION 16. OTHER INFORMATION

NFPA 704 (National Fire Protection Association):

Health - 1	Flammability - 1	Instability - 1	Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1	Flammability - 1	Physical Hazard - 1	PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: The following sections have been revised: Section 1: Chemical Product and Company Information.

Revision Date: 06/29/2012

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

ENCLOSURE 4

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

Table - 1

List of Chemicals - Fluopyram Manufacturing Process

June 25, 2019

Raw Material/Processing Aid (A.) (B.)	Intermediate/By Product/Product (A.)	CAS No.	Physical State (C.)
Acetic acid		64-19-7	liquid
Acetic anhydride		108-24-7	liquid
Aluminum nitrate, 20% aq.		7784-27-2	liquid
Butanol		71-36-3	liquid
Butyl acetate		123-86-4	liquid
n-Butyl chloride		109-69-3	liquid
	Carbon dioxide	124-38-9	gas
Dimethyl malonate (DMM)		108-59-8	liquid
DMAC (N,N-dimethylacetamide)		127-19-5	liquid
Formaldehyde, 37% aq.		50-00-0	liquid
Methanol	Methanol	67-56-1	liquid
Hydrochloric acid, 35% aq.		7647-01-0	liquid
Iso-octanol (2-ethylhexanol)		104-76-7	liquid
MTBE (Methyl tert-butyl ether)		1634-04-4	liquid
Potassium carbonate, 48% aq.		584-08-7	liquid
Potassium hydroxide (flakes)		1310-58-3	solid
PyCl (2,3-Dichloro-5-trifluoromethylpyridine)		69045-84-7	liquid
Sodium acetate		127-09-3	solid
Sodium hydroxide, 50% aq.		1310-73-2	liquid
TFMB-Amide (2-Trifluoromethylbenzamide)		360-64-5	solid
Toluene		108-88-3	liquid
	Py-DEET (Py-Diester)	895525-76-5	dissolved solid
	Py-MEET (Py-Malonester)	477859-76-0	dissolved solid
	Py-Na	not known	dissolved solid
	TFMB-Acetate	895525-72-1	dissolved solid
	TFMB-Hydroxy	895525-70-9	dissolved solid
	Fluopyram	658066-35-4	solid

CAS No. – Chemical Abstract Service Registry Number

(A.) Raw materials, processing aids, and by products listed alphabetically.

(B.) Although not specifically identified above, all process steps of the manufacture of Fluopyram directly, or indirectly, involves water.

(C.) Physical state at standard temperature and pressure.

ENCLOSURE 5

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

NOV 30 2018

Mr. Richard H. Rocha
Bayer CropScience LP
8400 Hawthorn Road
Kansas City, MO 64120

Re: Antidegradation Applicability Review for Bayer CropScience LP, MO-0002526, ACT#511, Jackson County

Dear Mr. Rocha:

In accordance with the *Missouri Antidegradation Rule and Implementation Procedure*, your proposed discharge is not subject to an Antidegradation Review at this time. The enclosed Antidegradation Applicability Review summarizes this determination based upon your review request received on November 9, 2018. You propose to begin production of a new pesticide, Fluopyram, at the Bayer CropScience LP facility located in Kansas City, MO on December 3, 2018. The initial production of Fluopyram will occur at a reduced manufacturing rate of approximately 8,943.6 lbs/day. The facility has indicated that the wastewater produced during production at this reduced manufacturing rate will not cause any excursion of the effluent limits currently in place in the facility's Missouri State Operating Permit. The wastewater will be treated by the facility's existing wastewater treatment plant and discharged through Outfall #001. The design flow will remain 2.8 million gallons per day. As the manufacturing rate of Fluopyram begins to increase toward full-scale production, the facility will be required to undergo an Antidegradation Review to ensure the facility will remain in compliance with its effluent limits. Please submit your Antidegradation application in a timely manner, so that the review can be completed and the operating permit can be issued prior to the time in which the facility reaches a Fluopyram production rate that would result in approaching the existing permit limits.

This determination does not supersede any requirements of the operating permit or enforcement actions. Nothing in this review removes any obligations to comply with county or other local ordinances or restrictions.

If you should have questions, please contact Ms. Ellen Modglin by telephone at 573-751-7466, by e-mail at ellen.modglin@dnr.mo.gov, or by mail at the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

WATER PROTECTION PROGRAM

John Rustige, P.E., Chief
Wastewater Engineering Unit

RM:emn

Enclosure

c: Mr. Rob K. Morrison, P.E., Barr Engineering
Ms. Pam Hackler, Water Protection Program
Kansas City Regional Office

ENCLOSURE 6

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

MAY 06 2019

Mr. Richard Rocha
Bayer U.S. LLC, Crop Science
8400 Hawthorn Road
Kansas City, MO 64120

RE: Water Quality and Antidegradation Review Preliminary Determination for Bayer CropScience LP, MO-0002526

Dear Mr. Rocha:

In accordance with the *Missouri Antidegradation Rule and Implementation Procedure (AIP)*, your proposed discharge is subject to an Antidegradation Review. The enclosed *Water Quality and Antidegradation Review (WQAR)* summarizes this preliminary determination based upon your *Bayer CropScience LP Antidegradation Review Report* dated March 2019, which proposed to increase the production rate of the pesticide chemical Fluopyram to 85,435 pounds per day, which is equivalent to 28,535,294 pounds per year. The effluent wastewater associated with the production of Fluopyram will be discharged through Outfall #001. The design flow of Outfall #001 will remain unchanged at 2.80 million gallons per day.

The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Rule and Implementation Procedure* (AIP) dated July 13, 2016, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources (Department) initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4. The WQAR would also allow you to pursue construction of one of the other approved reasonable alternatives without the need to modify this Antidegradation review.

You may proceed with submittal of an application for an operating permit modification. These submittals must reflect the design flow, facility description, and general treatment components of this WQAR or this preliminary determination may have to be revisited. Following the Department's public notice of draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the Department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and determinations will be considered final.

If you should have questions, please feel free to contact Ms. Ellen Modglin by telephone at 573-751-7466, by e-mail at Ellen.Modglin@dnr.mo.gov, or by mail at P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

WATER PROTECTION PROGRAM

Refaat Mefrakis, P.E., Chief
Engineering Section

Enclosures

RM:emn

c: Mr. Rob Morrison, P.E., Barr Engineering

ENCLOSURE 7

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

ATTACHMENT 5
Item 2.50 C of Form C

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC.	
491,050 (A.)	lbs/day	Pesticide Manufacturing - Cyclanilide, Flufenacet, Metribuzin, Propoxycarbazone-sodium, Pyrasulfotole, Tebuconazole, and Tembotrione	001
215,028	lbs/day	Formulation of Chemical Pesticides - Captan, Carbaryl, Chlorpyrifos, Clothianidin, Coumaphos, Cyclanilide, Beta-Cyfluthrin, Cyfluthrin, Cyprosulfamide, Deltamethrin, Dicamba, Dichlorvos, Ethephon, Ethofumesate, Fenamidone, Flubendiamide, Fluopyram, Fluoxastrobin, Flupyradifurone, Flutolanil, Fosetyl-Al, Imidacloprid, Iprodione, Isoxaben, Isoxadifen-ethyl, Isoxaflutole, Metalaxyl, Metribuzin, Oxadiazon, Penflufen, Permethrin, Propiconazole, Prothioconazole, Pyrimethanil, Spirodiclofen, Spiromesifen, Spirotetramat, Tebuconazole, Tembotrione, Tetrachlorvinphos, Thiacloprid, Thiencarbazone-Methyl, Thiodicarb, Thiram, Thiophanate-Methyl, Triadimefon, Trifloxystrobin, Triticonazole	001
23,892	lbs/day	Formulation of Biological Pesticides - Bacillus firmus	001
88,936	lbs/day	Manufacture of Inorganic Compounds - Sodium Hypochlorite	001
62,669	lbs/day	Environmental Pollution Control Equipment - Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	001
296,300 283,667	gals/day (99th %) gals/day (monthly avg. maximum)	Hazardous Waste Combustor - Incineration of aqueous and organic waste in Thermal Oxidizer II	001 & 002
768,377	gals/day	Intermediate Production - Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	001

(A.) Does not include the production of intermediates; which are substantial in number (i.e., many different types) and substantial in pounds produced.

ENCLOSURE 8

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

ATTACHMENT 5
Item 2.50 C of Form C

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC.	
576,485 (A.)	lbs/day	Pesticide Manufacturing - Cyclanilide, Flufenacet, Fluopyram, Metribuzin, Propoxycarbazone-sodium, Pyrasulfotole, Tebuconazole, and Tembotrione	001
215,028	lbs/day	Formulation of Chemical Pesticides - Captan, Carbaryl, Chlorpyrifos, Clothianidin, Coumaphos, Cyclanilide, Beta-Cyfluthrin, Cyfluthrin, Cyprosulfamide, Deltamethrin, Dicamba, Dichlorvos, Ethephon, Ethofumesate, Fenamidone, Flubendiamide, Fluopyram, Fluoxastrobin, Flupyradifurone, Flutolanil, Fosetyl-Al, Glufosinate-ammonium, Imidacloprid, Iprodione, Isoxaben, Isoxadifen-ethyl, Isoxaflutole, Mesotrione, Metalaxyl, Metribuzin, Oxadiazon, Penflufen, Permethrin, Propiconazole, Prothioconazole, Pyrimethanil, Spirodiclofen, Spiromesifen, Spirotetramat, Tebuconazole, Tembotrione, Tetrachlorvinphos, Tetraniliprole, Thiacloprid, Thiencarbazone-Methyl, Thiodicarb, Thiram, Thiophanate-Methyl, Tioxazafen, Triadimefon, Trifloxystrobin, and Triticonazole	001
23,892	lbs/day	Formulation of Biological Pesticides - Bacillus firmus and Bacillus thuringiensis	001
88,936	lbs/day	Manufacture of Inorganic Compounds - Sodium Hypochlorite	001
62,669	lbs/day	Environmental Pollution Control Equipment - Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	001
296,300 283,667	gals/day (99th %) gals/day (monthly avg. maximum)	Hazardous Waste Combustor - Incineration of aqueous and organic waste in Thermal Oxidizer II	001 & 002
785,177	gals/day	Intermediate Production - Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	001

(A.) Does not include the production of intermediates; only final step in production of pesticide active ingredient.

ENCLOSURE 9

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

Table 2 - Summary of Revised MSOP Permit Limits from Fluopyram Manufacture

Bayer MSOP Permit No.: MO-0002526
(effective date July 1, 2018; modification date November 1, 2018))

Effluent Parameter (from Table A-1 page 3 of 13 of MSOP)	Type of Limit in MSOP	Limits Appearing in Current MSOP (11-1-2018)	Delta Change from adding Fluopyram Manufacture	Revised Permit Limits After Permit Modification
Design flow Wastewater Treatment Plant	- - -	2.8 MGD	no change	no change
E. coli	- - -	no change	no change	no change
pH	- - -	no change	no change	no change
Biochemical Oxygen Demand (BOD)	*Daily Maximum* *Monthly Average*	5,994 lbs/day 1,418 lbs/day	+ 649 lbs/day + 143 lbs/day	6,643 lbs/day 1,561 lbs/day
Chemical Oxygen Demand (COD)	*Daily Maximum* *Monthly Average*	10,523 lbs/day 7,224 lbs/day	+ 1,127 lbs/day + 776 lbs/day	11,650 lbs/day 8,000 lbs/day
Total Organic Pesticide Chemicals	*Daily Maximum* *Monthly Average*	7.1 lbs/day 2.5 lbs/day	+ 0.82 lbs/day + 0.14 lbs/day	7.9 lbs/day 2.6 lbs/day
Total Suspended Solids (TSS)	*Daily Maximum* *Monthly Average*	5,776 lbs/day 1,726 lbs/day	+ 546 lbs/day + 161 lbs/day	6,322 lbs/day 1,887 lbs/day
Metribuzin	- - -	no change	no change	no change
Trichloromethane (aka, chloroform)	- - -	no change	no change	no change
Priority Pollutants (from Table A-3)	- - -	no change	no change	no change
Ammonia	- - -	no change	no change	no change

ENCLOSURE 10

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

Table 3 - Derivation of revised BOD Permit Limits from Fluopyram Manufacture

(from page 32 of 62 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table 3.1 - Current BOD Permit Limits

BOD ELG SECTION	PERMITTEE's VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 manufactures pesticides in lbs/day	491,050	7.4	1.6	pounds per 1000 pounds	3,633.77	785.68
BCT 455.23 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.768377	120	45	8.34	768.99	288.37
SUM					**5,994**	**1,418**

Table 3.2 - Revised BOD Permit Limits with Fluopyram Manufacture

BOD ELG SECTION	PERMITTEE's VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 manufactures pesticides in lbs/day	576,485	7.4	1.6	pounds per 1000 pounds	4,265.99	922.38
BCT 455.23 formulates pesticides in lbs/day	215,028	7.4	1.6	pounds per 1000 pounds	1,591.21	344.04
BPT/BPJ 414.81 contributes to intermediate production in MGD	0.785177	120	45	8.34	785.81	294.68
SUM					**6,643**	**1,561**

Table 4 - Derivation of revised COD Permit Limits from Fluopyram Manufacture

(from page 33 of 62 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table 4.1 - Current COD Permit Limits

COD ELG SECTION	PERMITTEE'S VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	491,050	13	9	pounds per 1000 pounds	6,383.65	4,419.45
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.768377	120	45	8.34	768.99	288.37
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %tile daily max; x2.1 monthly average	236.58	496.81
SUM					**10,523**	**7,224**

Table 4.2 - Revised COD Permit Limits with Fluopyram Manufacture

COD ELG SECTION	PERMITTEE'S VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.22 manufactures in lbs/day	576,485	13	9	pounds per 1000 pounds	7,494.31	5,188.37
BPT/BPJ 455.22 formulates in lbs/day	215,028	13	9	pounds per 1000 pounds	2,795.36	1,935.25
BPT 415.542 inorganic production in lbs/day	88,936	3.8	0.95	pounds per 1000 pounds	337.96	84.49
BPT 414.81 intermediate production contributes in MGD	0.785177	120	45	8.34	785.81	294.68
BPJ 444 incinerator contributes in MGD	0.283667	100	n/a	25th %tile daily max; x2.1 monthly average	236.58	496.81
SUM					**11,650**	**8,000**

Table 5 - Derivation of revised Total Organic Pesticides Permit Limits from Fluopyram Manufacture

(from page 34 of 62 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table 5.1 - Current Total Organic Pesticides Permit Limits

Total Organic Pesticide Chemicals	PERMITTEE'S VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.20 manufacture in lbs/day	491,050	0.01	0.0018	0.001	4.9105	0.88389
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.1**	**2.5**

Table 5.2 - Revised Total Organic Pesticides Permit Limits with Fluopyram Manufacture

Total Organic Pesticide Chemicals	PERMITTEE'S VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.20 manufacture in lbs/day	576,485	0.01	0.0018	0.001	5.7649	1.03767
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.9**	**2.6**

Table 6 - Derivation of revised TSS Permit Limits from Fluopyram Manufacture

(from page 34 of 62 of current Fact Sheet)

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)

Table 6.1 - Current TSS Permit Limits

TSS ELG SECTION	PERMITTEE'S VALUES (Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 pesticide manufacture in lbs/day	491,050	6.1	1.8	pounds per 1000 pounds	2,995.41	883.89
BPT/BPJ 455.23 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.768377	183	57	8.34	1,172.71	365.27
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**5,776**	**1,726**

Table 6.2 - Revised TSS Permit Limits with Fluopyram Manufacture

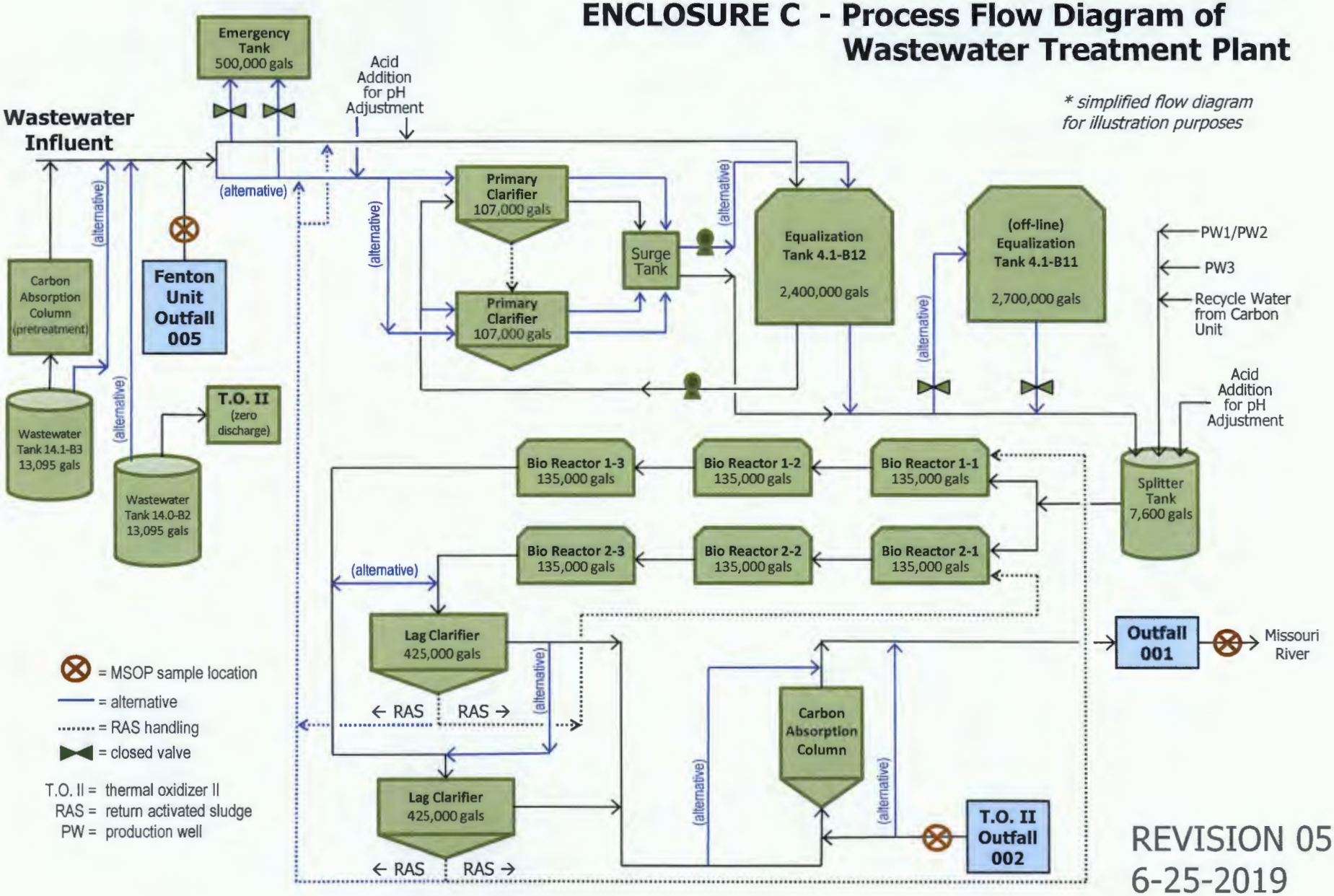
TSS ELG SECTION	PERMITTEE'S VALUES (Revised Attachment 5)	ELG DAILY ALLOWANCE	ELG MONTHLY ALLOWANCE	FACTOR	DAILY MAX IN LBS/DAY	MONTHLY AVERAGE IN LBS/DAY
BPT 455.23 pesticide manufacture in lbs/day	576,485	6.1	1.8	pounds per 1000 pounds	3,516.56	1,037.67
BPT/BPJ 455.23 Formulates pesticides in lbs/day	215,028	6.1	1.8	pounds per 1000 pounds	1,311.67	387.05
BPT 415.542 inorganic production in lbs/day	88,936	0.32	0.08	pounds per 1000 pounds	28.46	7.11
BPT 414.81 intermediate production contributes in MGD	0.785177	183	57	8.34	1,198.35	373.26
BPJ 444 incinerator contributes in MGD	0.283667	113	34.8	8.34	267.33	82.33
SUM					**6,322**	**1,887**

ENCLOSURE 11

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

ENCLOSURE C - Process Flow Diagram of Wastewater Treatment Plant

** simplified flow diagram for illustration purposes*



REVISION 05
6-25-2019

ENCLOSURE 12

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

READ ME

This flash drive contains a complete electronic copy in Adobe format of Bayer CropScience's permit modification submittal to the MDNR dated June 25, 2019. In addition, the flash drive contains a copy of Bayer's cover letter in MS Word format, and copies of select enclosures in PowerPoint, MS Word, and Excel formats.

Permit Modification Request

MSOP No.: MO-0002526

Bayer CropScience
8400 Hawthorn Road
Kansas City, Missouri 64120

June 25, 2019

Questions can be directed to:

Mr. Richard H. Rocha
Bayer CropScience
8400 Hawthorn Road
Kansas City, Missouri 64120

phone: 816-242-2793
email: richard.rocha@bayer.com

ENCLOSURE 13

to Bayer CropScience's
June 25, 2019 MSOP
Permit Modification

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *main outfall*	**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 **July 1, 2018** 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	MONTHLY AVERAGE	MEASURE FREQUENCY	SAMPLE TYPE
ELG § 455 TABLE 4					
1,1-Dichloroethylene	lbs/day Ω	0.58	0.37	once/year	grab
1,1,1-Trichloroethane	lbs/day Ω	1.25	0.49	once/year	grab
1,2-Dichloroethane	lbs/day Ω	4.89	1.58	once/year	grab
1,2-Dichloropropane	lbs/day Ω	5.33	3.55	once/year	grab
1,2-Dichlorobenzene	lbs/day Ω	3.78	1.79	once/year	composite ¥
1,2-trans-Dichloroethylene	lbs/day Ω	1.25	0.49	once/year	grab
1,3-Dichloropropene {aka} 1,3-Dichloropropylene	lbs/day Ω	1.02	0.67	once/year	grab
1,4-Dichlorobenzene	lbs/day Ω	0.65	0.35	once/year	composite ¥
2-Chlorophenol	lbs/day Ω	2.27	0.72	once/year	composite ¥
2,4-Dichlorophenol	lbs/day Ω	2.60	0.90	once/year	composite ¥
2,4-Dimethylphenol	lbs/day Ω	0.83	0.42	once/year	composite ¥
Benzene	lbs/day Ω	3.15	0.86	once/year	grab
Bromodichloromethane {aka} Dichlorobromomethane	lbs/day Ω	8.81	3.29	once/year	grab
Bromomethane {aka} Methyl Bromide	lbs/day Ω	8.81	3.29	once/year	grab
Chlorobenzene	lbs/day Ω	0.65	0.35	once/year	grab
Chloromethane {aka} Methyl Chloride	lbs/day Ω	4.41	1.99	once/year	grab
Cyanide (Total)	lbs/day Ω	14.84	5.10	once/year	grab
Dibromochloromethane {aka} Chlorodibromomethane	lbs/day Ω	18.41	4.54	once/year	grab
Dichloromethane {aka} Methylene Chloride	lbs/day Ω	2.06	0.93	once/year	grab
Ethylbenzene	lbs/day Ω	2.50	0.74	once/year	grab
Lead (Total)	lbs/day Ω	16.00	7.42	once/year	composite ¥
Naphthalene	lbs/day Ω	1.37	0.51	once/year	composite ¥
Phenol	lbs/day Ω	0.60	0.35	once/year	composite ¥
Tetrachloroethylene	lbs/day Ω	1.30	0.51	once/year	grab
Tetrachloromethane {aka} Carbon Tetrachloride	lbs/day Ω	0.88	0.42	once/year	grab
Toluene	lbs/day Ω	1.85	0.60	once/year	grab
Tribromomethane {aka} Bromoform	lbs/day Ω	4.97	1.23	once/year	grab

MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018.
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Facility will also report all parameters in µg/L. See following Table A-4.

JANUARY 28, 2019

by the chemical name 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-5,8-exo-dimethanonaphthalene. (b) DDT—*DDT* means the compounds DDT, DDD, and DDE as identified by the chemical names: (DDT)-1,1,1-trichloro-2,2-bis(p-chlorophenyl) ethane and someo,p'-isomers; (DDD) or (TDE)-1,1-dichloro-2,2-bis(p-chlorophenyl) ethane and some o,p'-isomers; (DDE)-1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene. (c) Endrin—*Endrin* means the compound endrin as identified by the chemical name 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-5,8-endodimethanonaphthalene. (d) Toxaphene—*Toxaphene* means a material consisting of technical grade chlorinated camphene having the approximate formula of C_{10} H_{10} Cl_8 and normally containing 67-69 percent chlorine by weight. (e) Benzidine—*Benzidine* means the compound benzidine and its salts as identified by the chemical name 4,4'-diaminobiphenyl. (f) Polychlorinated Biphenyls (PCBs) *polychlorinated biphenyls* (PCBs) means a mixture of compounds composed of the biphenyl molecule which has been chlorinated to varying degrees.

intermediates

ELG Table 1: Maximum Production: Form C - Item 2.50

OPERATION	PRODUCT & ACTION	QUANTITY
Pesticide Manufacturing	See *ELG Table 2*	491,050 lbs/day * (value does not include intermediated)
Formulation of Chemical Pesticides	See *ELG Table 2*	total formulated 215,028 lbs/day
Formulation of Biological Pesticides	*Bacillus firmus* (bacterial nematode insecticide)	23,892 lbs/day
Manufacture of Inorganic Compounds	Sodium Hypochlorite (removed Sodium Sulfhydrate*); bleach	88,936 lbs/day *
Environmental Pollution Control Equipment	Discharge of sodium hypochlorite to process sewer from air scrubbers and point source treatment of hydrazine	62,669 lbs/day
Hazardous Waste Combustor	Incineration of aqueous and organic waste in Thermal Oxidizer II (Outfalls #001 and #002)	296,300 gals/day (99th %) 283,667 gals/day (95th %)
Intermediate Production	Intermediate and intermediate precursor's production in the manufacture of pesticide active ingredients	768,377 gallons/day *

All operations apply to outfall #001 unless otherwise stated.
* Value modified per letter dated July 14, 2017.

✓ The permittee provided explanations for best professional judgment (BPJ) inclusions of allowances at outfall #001 for BOD_5, COD, TSS, and chloroform. The permit writer has reviewed the requested allowances and determined them to be relevant to the discharges. See the application for permit addendum *Background Information in Support of Wastewater Permit Renewal Application*; December 16, 2016. See Part IV-Derivation and Limits discussion for outfall #001.

BPT: CWA 304(b)(1) the best practicable control technology – see individual parameters in Part V
BAT: CWA 301(b)(2)(A) the best available technology economically achievable
BAT is used for non-conventional and toxic pollutants.
301(b)(2)(A) categories and classes of point sources which discharge toxic and non-conventional pollutants must use BAT to result in national goal of elimination of pollution. 301(b)(2)(C) and (D) state that deadline for toxics to comply with BAT is 1989.
301(b)(2)(F) states that deadline for non-conventional to comply with BAT is 1989. BPTs are still provided in statute because BPT must still be met even if a variance is granted from BATs.

Total Organic Pesticide Chemicals

The previous permit's limits were 10.78 pounds/day maximum; 4.69 lbs/day monthly average. §455.20 - Applicability; description of the organic pesticide chemicals manufacturing subcategory.
(b) For the purpose of calculating BPT effluent limitations for organic pesticide chemicals, the provisions of this subpart are applicable to discharges resulting from the manufacture of the following organic active ingredients (PAIs): Aldrin, BHC, Captan, Chlordane, DDD, DDE, DDT, Dichloran, Dieldrin, Endosulfan, Endrin, Heptachlor, Lindane, Methoxychlor, Mirex, PCNB, Toxaphene, Trifluralin, Azinphos Methyl, Demeton-O, Demeton-S, Diazinon, Disulfoton, Malathion, Parathion Methyl, Parathion Ethyl, Aminocarb, Carbaryl, Methiocarb, Mexacarbate, Propoxur, Barban, Chlorpropham, Diuron, Fenuron, Fenuron-TCA, Linuron, Monuron, Monuron-TCA, Neubron, Propham, Swep, 2,4-D, Dicamba, Silvex, 2,4,5-T, Siduron, Perthane, and Dicofol. Of these listed PAIs, the facility manufactures metribuzin.

40 CFR 455.41(e) allows for additional BPJ considerations for tank washing (etc) and pesticide formulation. The previous permit arbitrarily used an average of the 80 lowest BAT effluent limitations found on table 2 of § 455 for the discharge allowance. The current permit writer has determined using the same multiplier values as the manufactured pesticides is more reasonable as that is then an allowable discharge of the sum of all organic pesticides.

Total Organic Pesticide Chemicals	Permittee's Value	ELG Daily Allowance	ELG Monthly Allowance	Factor	Daily Max in lbs/day	Monthly Average in lbs/day
BPT 455.20 manufacture in lbs/day	491,050	0.01	0.0018	0.001	4.9105	0.88389
BPJ 455.41 formulation in lbs/day	215,028	0.01	0.00743	0.001	2.15028	1.597658
SUM					**7.1**	**2.5**

Previous permit limits were higher because the permittee reported a reduction by about half in pesticide formulation values. For BPJ, the previous permit stated they used an average of the 80 lowest BAT values for pesticides from table 2; (an average of 0.00743) for the monthly average BPJ limit; 0.01 was used for the daily maximum from §455.20. Values for BPJ continued. Weekly sampling continued from previous permit. The previous permit required composite sampling; the permit writer has determined a grab sample is more appropriate as certain organic chemicals may degrade over time and cause falsely low effluent values.

There is no singular water quality standard for total organic pesticides, however, the permit writer has determined a summation of the pesticides listed in the applicability standard should be compared to the discharge. After mathematical evaluation, there is no WQ RP for total organic pesticide chemicals.

TSS

Total Suspended Solids (TSS)

Previous permit limitations were 7,957 pounds per day maximum, and 2,355 pounds per day monthly average and the facility also reported in concentration. There is no water quality standard for TSS. The facility reported maximum 2,804 pounds and 316 mg/L; average was The previous permit calculated COD using the building block method for technology based effluent limitations, as is found in the EPA permit writer's manual chapter 5 https://www.epa.gov/sites/production/files/2015-09/documents/pwm_chapt_05.pdf The permit writer has continued the use of this method as the most appropriate method to calculate permit limits. There are no water quality limitations to compare for this parameter.

Applicability is discussed in Part III: ELG – Effluent Limitation Guidelines. The permit limit for TSS from contribution from hazardous waste combustion is based on 40 CFR 444, Subpart A per the permittee's BPJ. The combustion of hazardous wastes results in a wastewater flow of 0.284 MGD to the wastewater treatment facility. The permit limit for TSS from production of inorganic compounds, specifically sodium hypochlorite and sodium sulfhydrate is based on 40 CFR 415, Subpart BB per the permittee's BPJ. The facility manufactures 116,158 pounds/day of these compounds.

Permit Limit = (Effluent Limit Guideline) x (lbs production/1,000) or
Permit Limit = (Effluent Limit Guideline) x (flow in MGD) x (8.34 lbs/gal conversion factor)
Weekly composite sampling required. The facility will also report in mg/L.