



SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

June 4, 2021

Robert R. Compernelle, President  
Fansteel Metals, Inc.  
10 Tantalum Place  
Muskogee, OK 74403

Re: OPDES Renewal Application, DEQ Permit No. OK0001643  
Fansteel Metals, Inc., Muskogee County, Oklahoma  
Facility ID No. I-51000040

Dear Mr. Compernelle:

Your request to change the name of your facility from FMRI, Inc. to Fansteel Metals, Inc., was received by this office on May 19, 2021. Please find enclosed with this letter, your updated industrial wastewater treatment system Permit. The effective date and the expiration date of this Permit appear on the cover page.

Should you have any questions regarding this Permit, please contact the Industrial Permits Section at the letterhead address or telephone (405) 702-8100. Should you have any questions regarding compliance with the conditions of this Permit, please contact the Industrial Enforcement Section at the same address and phone number.

Sincerely,

A handwritten signature in black ink that reads "Carol Paden".

Carol Paden, P.E., Manager  
Industrial Permits Section  
Water Quality Division

CMP/PM/tlj      ZM/SLT/AR/AB/PP

Enclosures



**AUTHORIZATION TO DISCHARGE UNDER  
THE OKLAHOMA POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**PERMIT NUMBER: OK0001643  
ID NUMBER: I-51000040**

In compliance with the Oklahoma Pollutant Discharge Elimination System (OPDES) Act, 27A O.S. §2-6-201 *et seq.*, Oklahoma Uniform Environmental Permitting Act, 27A O.S. §2-14-101 *et seq.*, and the rules of the Oklahoma Department of Environmental Quality promulgated thereunder,

Fansteel Metals, Inc. - Muskogee  
10 Tantalum Place  
Muskogee, OK 74403

is authorized to discharge wastewater from their facility, located at:

NW¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM  
Muskogee County, Oklahoma  
or at 10 Tantalum Place, Muskogee, OK 74403

to receiving waters: Arkansas River in Stream Segment 120400 (Water body ID# 120400010260)

from Outfall 001 located at:

Latitude 35° 46' 24.293" N, Longitude 95° 18' 06.355" W (GPS: NAD83)  
SE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM,  
Muskogee County, Oklahoma

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III, hereof.

The above-referenced facility is authorized to retain wastewater in four (4) flow-through surface impoundments (F01, F02, F03 and F04) as described in the Appendix. Surface impoundments shall be maintained in accordance with Parts I, II, and IV hereof.

Issuance of this permit in no way or in any respect affects the permittee's civil or criminal responsibility regarding disposal of wastewater, except with respect to the permittee's legal responsibility under the OPDES Act and Department Rules.

This permit replaces and/or supersedes OPDES Permit No. OK0001643 that became effective on October 1, 2020.

This permit shall become effective on July 1, 2021.

This permit and the authorization to discharge shall expire at midnight, on September 30, 2025.

This is to certify that the wastewater discharges set forth in this permit comply with the requirements of Oklahoma's Water Quality Standards, as amended, provided the permittee does not exceed the effluent limitations set forth in this permit.

Issued this 4<sup>th</sup> day of June, 2021.

For Oklahoma Department of Environmental Quality,



Carol Paden, P.E., Manager  
Industrial Permits Section  
Water Quality Division



Shellie R. Chard, Director  
Water Quality Division



PART I  
EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

SECTION A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Effluent Limitations and Monitoring Requirements for Outfall 001

During the period beginning the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge from Outfall 001.

The discharge from Outfall 001 consists of treated effluent from contaminated groundwater and stormwater remediation. Such discharge shall be limited and monitored by the permittee as specified below:

Mass and Concentration Limitations - Outfall 001

PARAMETERS <sup>a</sup>	DISCHARGE LIMITATIONS			
	MASS LOADING LIMITS (lbs/day unless otherwise specified)		CONCENTRATION LIMITS (mg/L unless otherwise specified)	
	DAILY AVERAGE	DAILY MAXIMUM	DAILY AVERAGE	DAILY MAXIMUM
Flow STORET: 50050	Report (MGD)	Report (MGD)	N/A	N/A
Ammonia (as N) STORET: 00610	98	172	37	65
Arsenic, total STORET: 01002	N/A	N/A	Report	Report
Niobium, total <sup>b</sup> STORET: 01239	0.21	0.32	0.078	0.12
Fluoride, total STORET: 00951	29	32	11	12
Lead, total STORET: 01051	0.14	0.24	0.054	0.090
Nitrite-Nitrogen (as N) STORET: 00620	27	37	10	14
Total Dissolved Solids STORET: 70300	N/A	N/A	Report	Report
pH STORET: 00400	N/A	N/A	6.5 s.u. to 9.0 s.u.	

<sup>a</sup> Units are mg/L, unless otherwise specified.  
<sup>b</sup> Formerly Columbium, STORET: 01139

NOTE: See Parts II and III for Additional Requirements.

There shall be no discharge of a visible sheen of oil or globules of oil or grease on or in the water. Oil and grease shall not be present in quantities that adhere to stream banks and coat bottoms of water courses.

Surface waters of the State shall be maintained free from oil and grease and taste and odors.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The discharge shall not contain chemical, physical, or biological substances in concentrations that are irritating to skin or sense organs or are toxic or cause illness upon ingestion by human beings.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location:

**Outfall 001:** At the facility discharge pipe before it leaves the facility, and prior to discharging to the Arkansas River in the SE¼, NW¼, SW¼, Section 16, Township 15N, Range 19WIM, Muskogee County, Oklahoma, or at Latitude 35° 46’ 24.293”N, Longitude 95° 18’ 06.355”W (GPS: NAD83).

Monitoring Requirements and Sample Types – Outfall 001

PARAMETERS	MEASUREMENT FREQUENCY <sup>(1)</sup>	SAMPLE TYPE
Flow (MGD)	Continuous	Record
Ammonia (as N)	1/month	24-hr comp
Arsenic, total	1/month	24-hr comp
Niobium, total	1/month	24-hr comp
Fluoride, total	1/week	24-hr comp
Lead, total	1/month	24-hr comp
Nitrate Nitrogen (as N)	1/month	24-hr comp
Total Dissolved Solids	1/quarter	24-hr comp
pH	3/week	grab

<sup>(1)</sup> When discharging.

SECTION B. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule: None

SECTION C. GROUNDWATER MONITORING REQUIREMENTS

1.
- During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee shall monitor the groundwater in wells 51, 52, 53, 54, 56, and 75 according to the following table:

PARAMETERS	CONCENTRATION/OTHER UNITS (mg/L unless otherwise specified)		MONITORING REQUIREMENTS	
	DAILY AVERAGE	DAILY MAXIMUM	MONITORING FREQUENCY	SAMPLE TYPE
Depth to Groundwater	N/A	Report Feet <sup>(1)</sup>	1/2-years	Estimate
pH	N/A	Report S.U.	1/2-years	Grab
Ammonia (as N)	N/A	Report	1/2-years	Grab
Fluoride	N/A	Report	1/2-years	Grab
Total Dissolved Solids	N/A	Report	1/2-years	Grab
Alpha/Beta Radiation	N/A	Report pCi/l	1/2-years	Grab

<sup>(1)</sup> Depth shall be reported as “Dry” if there is no liquid present in the monitoring well



2. During the period beginning the effective date of the permit and lasting through the expiration date, the permittee shall monitor the groundwater in wells 55, 65, 68, 69, and 70 according to the following schedule found on the next page:

PARAMETERS	CONCENTRATION/OTHER UNITS (mg/L unless otherwise specified)		MONITORING REQUIREMENTS	
	DAILY AVERAGE	DAILY MAXIMUM	MONITORING FREQUENCY	SAMPLE TYPE
Depth to Groundwater	N/A	Report Feet <sup>(1)</sup>	1/2-years	Estimate
pH	N/A	Report S.U.	1/2-years	Grab
Arsenic	N/A	Report	1/2-years	Grab
Cadmium	N/A	Report	1/2-years	Grab
Chromium	N/A	Report	1/2-years	Grab
Lead	N/A	Report	1/2-years	Grab
Ammonia (as N)	N/A	Report	1/2-years	Grab
Fluoride	N/A	Report	1/2-years	Grab
Total Dissolved Solids	N/A	Report	1/2-years	Grab
Alpha/Beta Radiation	N/A	Report pCi/l	1/2-years	Grab

<sup>(1)</sup> Depth shall be reported as “Dry” if there is no liquid present in the monitoring well

3. During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee shall monitor the groundwater in wells 57, 62, and 63 according to the following table:

PARAMETERS	CONCENTRATION/OTHER UNITS (mg/L unless otherwise specified)		MONITORING REQUIREMENTS	
	DAILY AVERAGE	DAILY MAXIMUM	MONITORING FREQUENCY	SAMPLE TYPE
Depth to Groundwater	N/A	Report Feet <sup>(1)</sup>	1/2-years	Estimate
pH	N/A	Report S.U.	1/2-years	Grab
Arsenic	N/A	Report	1/2-years	Grab
Ammonia (as N)	N/A	Report	1/2-years	Grab
Fluoride	N/A	Report	1/2-years	Grab
Total Dissolved Solids	N/A	Report	1/2-years	Grab
Alpha/Beta Radiation	N/A	Report pCi/l	1/2-years	Grab

<sup>(1)</sup> Depth shall be reported as “Dry” if there is no liquid present in the monitoring well

4. During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee shall monitor the groundwater in wells 64, 67, 71, 72, and 74 according to the following table:

PARAMETERS	CONCENTRATION/OTHER UNITS (mg/L unless otherwise specified)		MONITORING REQUIREMENTS	
	DAILY AVERAGE	DAILY MAXIMUM	MONITORING FREQUENCY	SAMPLE TYPE
Depth to Groundwater	N/A	Report Feet <sup>(1)</sup>	1/2-years	Estimate
pH	N/A	Report S.U.	1/2-years	Grab
Arsenic	N/A	Report	1/2-years	Grab
Cadmium	N/A	Report	1/2-years	Grab
Chromium	N/A	Report	1/2-years	Grab
Lead	N/A	Report	1/2-years	Grab
Ammonia (as N)	N/A	Report	1/2-years	Grab
Fluoride	N/A	Report	1/2-years	Grab
Methyl Isobutyl Ketone	N/A	Report	1/2-years	Grab
Total Dissolved Solids	N/A	Report	1/2-years	Grab
Alpha/Beta Radiation	N/A	Report pCi/l	1/2-years	Grab

<sup>(1)</sup> Depth shall be reported as “Dry” if there is no liquid present in the monitoring well

5. During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee shall monitor the groundwater in Sump 1, Sump 2, Sump 3, and Sump 4 according to the following table:

PARAMETERS	CONCENTRATION/OTHER UNITS (mg/L unless otherwise specified)		MONITORING REQUIREMENTS	
	DAILY AVERAGE	DAILY MAXIMUM	MONITORING FREQUENCY	SAMPLE TYPE
Depth to Groundwater	N/A	Report Feet <sup>(1)</sup>	2/year	Estimate
pH	N/A	Report S.U.	2/year	Grab
Arsenic	N/A	Report	2/year	Grab
Cadmium	N/A	Report	2/year	Grab
Chromium	N/A	Report	2/year	Grab
Lead	N/A	Report	2/year	Grab
Ammonia (as N)	N/A	Report	2/year	Grab
Fluoride	N/A	Report	2/year	Grab
Methyl Isobutyl Ketone	N/A	Report	2/year	Grab
Total Dissolved Solids	N/A	Report	2/year	Grab
Alpha/Beta Radiation	N/A	Report pCi/l	2/year	Grab

<sup>(1)</sup> Depth shall be reported as “Dry” if there is no liquid present in the monitoring well

## **SECTION D. REPORTING OF MONITORING RESULTS**

Monitoring results shall be reported in accordance with the provisions of Part III.E.4 of the permit. Monitoring results obtained during the previous month shall be summarized and electronically reported on an electronic Discharge Monitoring Report (eDMR) form due to the Oklahoma Department of Environmental Quality, Water Quality Division, Wastewater Compliance Tracking Section no later than the 15<sup>th</sup> day of the month following the completed monthly test. If no discharge occurs during the reporting period, an eDMR form stating "No Discharge" shall be electronically submitted according to the above schedule. Instructions on how to register as a Preparer or Signatory for eDMRs, as well as how to prepare and submit eDMRs, can be found on DEQ's website at <https://www.deq.ok.gov/water-quality-division/electronic-reporting/>. Assistance is also available by contacting DEQ at (405) 702-8100 or [degreporting@deq.ok.gov](mailto:degreporting@deq.ok.gov).

The first report is due on August 15, 2021.



## **PART II**

### **OTHER PERMIT REQUIREMENTS**

#### **A. REGULATORY NOTICE**

The permittee is hereby given notice that this permit is in all respects subject to compliance with and actions under any and all applicable and relevant terms, conditions, provisions and requirements and any and all amendments of the laws of the State of Oklahoma, the rules of the Oklahoma Department of Environmental Quality, and Oklahoma's Water Quality Standards. The absence of any express reference within this permit of any particular statutory requirement, rule(s), regulation(s), or standard(s) shall in no respect be deemed or construed to exempt or preclude the application of such requirement, rule(s), regulation(s), or standard(s) to this permit or the permittee. By the Director's approval, grant and issuance of this permit, permittee acknowledges receipt of true, correct and current copies of Oklahoma's Water Quality Standards, and the rules of the Oklahoma Department of Environmental Quality.

#### **B. REOPENER CLAUSE**

This permit may be reopened for modification or revocation and reissuance to require additional monitoring and/or effluent limitations where actual or potential exceedances of State water quality criteria are determined to be the result of the permittee's discharge to the receiving water(s), or a Total Maximum Daily Load is established for the receiving stream(s), or when required as technology advances. Modification or revocation and reissuance of the permit shall follow regulations listed at 40 CFR 124.5.

#### **C. LABORATORY CERTIFICATION**

All laboratory analyses for the parameters specified in this permit must be performed by a laboratory certified by the Oklahoma Department of Environmental Quality for those parameters.

#### **D. ANALYTICAL REQUIREMENTS**

Unless otherwise specified in this permit, effluent and/or upstream monitoring shall be conducted according to analytical, apparatus and materials, sample collection, preservation, handling, etc., procedures listed at 40 CFR Part 136 in effect on the effective date of this permit. Appendices A, B, and C to 40 CFR Part 136 are specifically referenced as part of this requirement. Amendments to 40 CFR Part 136 promulgated and incorporated by reference into OAC 252:606 after the effective date of this permit shall supersede these requirements as applicable.

#### **E. MINIMUM QUANTIFICATION LEVEL (MQL)**

If any individual analytical test result taken for compliance with this permit is less than the corresponding minimum quantification level listed in OAC 252:690 Appendix B, a value of zero (0) may be used for that individual result for the DMR calculations and reporting requirements.

#### **F. POLYCHLORINATED BIYPHENYL COMPOUNDS**

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid at Outfall 001.

#### **G. SURFACE IMPOUNDMENT REQUIREMENTS**

1. A minimum freeboard of two feet (2) shall be maintained for surface impoundments F01, F02, F03 and F04.
2. The permit may be reopened to implement and/or require impoundment modifications, additions, extensions, and/or operational changes; monitoring and reporting; reclassification of wastes; sludge management plans; best

management practices; closure plans; and/or other appropriate actions.

3. At such time as any of the impoundments F01, F02, F03 and F04 are to be permanently taken out of service or at such time as the contents of any of the impoundments F01, F02, F03 and F04 pose a risk to the environment or waters of the state, the owner or operator of the facility shall be required to follow all closure requirements contained in OAC 252:616-13.

Additionally, during the closure activities of the surface impoundments F01, F02, F03 and F04, the “interceptor trench” shall also be subject to standard conditions contained in OAC 252:616-13 Closure Standards.

4. The facility shall develop and maintain a written IMOP that discusses maintenance, operational, and monitoring procedures as specified in OAC 252:616-5-2 for impoundments F01, F02, F03 and F04 that contain Class II wastewater. The IMOP shall be kept on site and made available to the DEQ upon request. The IMOP must be followed and updated annually, if necessary. The following shall be addressed in the IMOP.
  - a. Maintenance procedures including methods to protect impoundments and liner integrity
  - b. Operation procedures used to protect surface impoundments and liner integrity
  - c. The name and telephone number of personnel responsible for maintenance, operation and monitoring
5. In all other respects, surface impoundments F01, F02, F03 and F04 shall be subject to standard conditions for surface impoundments contained in OAC 252:616, Subchapters 5, 7, and 13, including but not limited to requirements for construction, operation, maintenance, monitoring and closure.

#### H. OTHER DISPOSAL METHODS

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewater shall be disposed of in a State-approved industrial waste disposal site or to a company for recycling.

If any such industrial wastes are removed from the facility, the permittee shall keep accurate records which include the following information:

- a. Name and address of company hauling waste.
- b. The type and amount of waste hauled.
- c. The final disposal site of waste hauled.

Upon request, the above records shall be made available to the staff of the Department for inspection, review, and copying.



APPENDIX A

DESCRIPTION OF WASTEWATER TREATMENT/DISPOSAL SURFACE IMPOUNDMENTS (S.I.s)

Classification OAC 252:616-1-2		Liner Type	Holding Capacity <sup>b</sup> or Dimensions OAC 252:616-7-1(6)	WASTEWATER Destination
S.I. <sup>a</sup>	Wastewater			
F01 (P6)	Treated effluent, groundwater and stormwater from F02 Class II	Compacted clay	~ 1,010,000 gallons 100' x 200' x 9'	Outfall 001
F02 (P7)	Treated effluent, groundwater and stormwater from F03 and F04 Class II	Compacted clay	~ 1,610,000 gallons 150' x 350' x 7'	F01
F03 (P8)	Treated effluent, groundwater and stormwater Class II	30 mil HDPE	~ 17,200,000 gallons 350' x 350' x 25'	F02 or F04
F04 (P9)	Treated effluent, groundwater and stormwater Class II	30 mil HDPE	~ 17,200,000 gallons 250' x 600' x 20'	F01 or F02

<sup>a</sup> Designation F refers to flow-through surface impoundment.  
<sup>b</sup> Based on information provided in the application.

LOCATION OF SURFACE IMPOUNDMENTS

S.I.	Legal Location	Relative Location of Impoundments
F01	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	Approximately 325 feet south of Chem “A” building
F02	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	South of facility and east of F03
F03	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	South of facility and west of F01, F02 and North of F04
F04	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	South of facility and south of F03



## FACT SHEET

FOR THE DRAFT AUTHORIZATION TO DISCHARGE TO WATERS OF THE UNITED STATES UNDER THE OKLAHOMA POLLUTANT DISCHARGE ELIMINATION SYSTEM (OPDES).

Permit Number:	OK0001643
Facility ID Number:	I-51000040
Applicant:	Fansteel Metals, Inc. – Muskogee 10 Tantalum Place Muskogee, OK 74403
Issuing Office:	Oklahoma Department of Environmental Quality Water Quality Division 707 N. Robinson P.O. Box 1677 Oklahoma City, OK 73101-1677
Prepared By:	Penn Mouluh Industrial Permits Section Water Quality Division
Date Prepared:	June 15, 2020
Reviewed by:	Carol Paden, P.E., Manager Industrial Permits Section Water Quality Division  Karen Steele, P.E., Assistant Division Director Water Quality Division
Date Modified:	June 2, 2021
Reviewed by:	Carol Paden, P.E., Manager Industrial Permits Section Water Quality Division

In accordance with 40 CFR 124.8 and 124.56, this fact sheet describes the applicant's facility operation and sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Also set forth are any calculations or other necessary explanations of the derivation of specific effluent limitations and conditions, including citations to applicable effluent limitation guidelines or performance standards as required by 40 CFR 122.44. In accordance with 40 CFR 122.44(1), proposed permit limits for reissued permits are based on the more stringent of applicable technology-based limitations, applicable water quality-based limitations, or limitations in the previous permit.

Citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations. Citations to OAC 252 and OAC 785 refer to promulgated regulations listed at Titles 252 and 785, Oklahoma Administrative Code.

## **I. PERMITTING BACKGROUND**

### **A. CHRONOLOGY OF PERMITTING ACTIVITIES**

The following is a chronology of permitting activities leading up to the renewal of this permit.

05/19/2021:	Request to change facility's name received.
07/15/2020:	Draft permit publicly noticed in newspaper by facility.
07/03/2020:	Draft permit publicly noticed by DEQ
07/02/2020:	Draft permit sent to the facility for public notice.
05/04/2020:	Received groundwater monitoring well data and additional information.
03/16/2020:	Administrative complete letter sent to facility.
03/10/2020:	Site visit conducted.
03/05/2020:	Requested information received from applicant.
02/13/2020:	Received EPA's acknowledgment of the facility's designation change.
02/13/2020:	NPDES Permit Rating Worksheet indicating the facility's designation change from a major to a minor sent to EPA Region 6 for approval.
02/10/2020:	Facility's designation reevaluated using NPDES Permit Rating Worksheet score system.
01/28/2020:	Administrative incomplete letter sent to applicant.
01/02/2020:	OPDES permit application (Forms 1, 2C, and 2SI) received.

### **B. PROPOSED PERMITTING ACTION**

It is proposed that the OPDES Permit No. OK0001643 be reissued for a five year term in accordance with regulations promulgated at 40 CFR 122.46(a) and OAC 252:606-1-3(b).

## **II. APPLICANT ACTIVITY**

### **A. DESCRIPTION AND LOCATION OF FACILITY**

Fansteel Metals, Inc., is located in the NW¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma or at 10 Tantalum Place, Muskogee, OK 74403. Fansteel Metals, Inc., Muskogee, formerly FMRI, Inc., is a former Tantalum and Niobium (formerly columbium) metals production facility. The facility began production in 1958, and operated for approximately 33 years until production ceased in 1989. Previously this facility was a primary producer of Tantalum and Niobium metals, but the primary production ceased in 1989. The facility was set up to recover specialty metals and fluoride from "Work-in-Progress" (WIP) residues generated from past ore and tin slag processing activities. Since 2004, the facility began decommissioning activities under the oversight of the US Nuclear Regulatory Commission.

The facility is presently undergoing decommissioning (NRC license number SMB-911), and the currently inactive WIP project is part of cleanup work to be done at the site (SIC Codes 3339 and 3341). Activities include decontamination of building surfaces and facility components, and excavation of impacted soils and residues. The facility employs approximately 2 employees, and operates 8 hours per day, 5 days per week, in one shift.

### **B. WASTEWATER GENERATION AND TREATMENT**

#### **1. Process Wastewater**

Based on the permit application, the facility discharges approximately 0.318 MGD of stormwater from decommissioning activities and treated groundwater to the Arkansas River. The wastewater currently being discharged from the facility consists primarily of treated groundwater that has been contaminated by



previous operations in the facility. A small amount of washdown water and water used to cool compressors is also discharged. A subsurface drain system has been installed to channel the contaminated groundwater to sumps. The groundwater is collected in four (4) sumps (Sump 1, Sump 2, Sump 3 and Sump 4) and pumped to the facility's wastewater treatment system. Stormwater from areas undergoing site remediation are also pumped to the treatment system.

The wastewater treatment system at the facility consists of four small concrete basins connected in series followed by a series of surface impoundments. The surface impoundments are used for settling of solids prior to discharge of the treated groundwater. Lime is added to control pH in the concrete basins prior to flowing to the surface impoundments.

## 2. Stormwater

This permit also includes stormwater from areas undergoing site remediation and it is also pumped to the treatment system. Stormwater outfalls that were being carried over from the previous permits will not be carried over in this permit, since the stormwater is treated and discharged with the contaminated groundwater water via Outfall 001.

### III. DISCHARGE INFORMATION

#### A. DISCHARGE LOCATION

##### Outfalls to Surface Waters

Outfall	Location		Receiving Stream
	Legal Description	Latitude – Longitude	
001	SE¼, NW¼, SW¼ Sect 16, T15N, R19EIM Muskogee Co., Oklahoma	N 35° 46' 24.293" W 95° 18' 06.355" (GPS: NAD83)	Arkansas River

#### B. DISCHARGE DESCRIPTION AND CHARACTERISTICS

Effluent characteristics are summarized below based on information provided in the permit application and facility DMRs over the two year period of record (December 31, 2017, through December 31, 2019), supplemented by additional analytical data collected after submission of the permit application. A quantitative and qualitative description of the discharge(s) described in the permit application is available upon request for review.

A summary of biomonitoring (whole effluent toxicity) testing data is provided in Section V.D.1.f.



## 1. Outfall 001

The discharge from Outfall 001 consists of treated wastewater as described part II.B.1.

### a. DMR Data (December 2017 – December 2019)

#### Effluent Flow (MGD)

Outfall	Frequency of Discharge	Type of Measurement	Long Term Avg	High 30-day Avg	Daily Max
001	Continuous	Record	0.272 <sup>a</sup>	0.318 <sup>a</sup>	0.364

<sup>a</sup> For comparison, the long term average and high 30 day average effluent flows for Outfall 001 on which previous permit was based were 0.296 and 0.356 MGD, respectively.

#### Conventional, Non-Conventional, and Priority Pollutants

Parameters	Mass Loadings (lbs/day unless otherwise specified)		Concentration/Other Units (mg/L unless otherwise specified)	
	Daily Maximum	Long-term Average	Daily Maximum	Long-term Average
Ammonia	8.53	3.27	2.81	1.91
Arsenic, Total (as As)	--	--	0.076	--
Nitrate, Total (as N)	4.80	2.59	1.8	1.02
Fluoride, Total (as F)	47.86	13.50	24	6.05
Lead, Total (as Pb)	<0.095	<0.109	0.01	<0.005
Niobium, Total	0.201	0.043	0.093	0.022
Total Dissolved Solids (TDS)	---	---	1290	928.6
pH	Between 7.61 – 7.88 s.u.			

**b. DEQ Application Data**

**Effluent Flow (MGD)**

Outfall	Frequency of Discharge	Type of Measurement	Long Term Avg	High 30-day Avg	Daily Max
001	Continuous	Record	0.288	0.318	0.324

**Conventional, Non-Conventional, and Priority Pollutants**

Parameter	No. of Analyses	Daily Maximum <sup>a</sup>	
		Concentration (mg/L)	Mass (lb/day)
BOD <sub>5</sub>	1	<3.33	---
COD	1	10.0	---
TOC	1	1.87	---
TSS	1	142	---
Ammonia (as N)	1	3.55	---
Total Dissolved Solids	1	871	---
Chloride	1	45.6	---
Sulfate	1	513	---
Fluoride	5	8	21
Lead, Total	6	<0.005	---
Alpha, Total	8	37.3 (pCi/l)	---
Beta, Total	8	44.8 (pCi/l)	---
Nitrate-Nitrite (as N)	3	1.8	4.8
pH	19	Between 7.21 – 8.78 s.u.	

<sup>a</sup> DEQ application data, Form 2C.

**IV. TECHNOLOGY-BASED EFFLUENT LIMITATIONS AND CONDITIONS**

**A. GENERAL**

Regulations promulgated at 40 CFR 122.44(a) and OAC 252:606-5-2(1) require technology-based effluent limitations to be placed in OPDES permits based on effluent limitation guidelines where applicable, on Best Professional Judgment (BPJ) of the permit writer in the absence of guidelines, or on a combination of the two.

**B. APPLICABLE EFFLUENT LIMITATION GUIDELINES**

Discharges from facilities that produce Niobium (formerly Columbium) – Tantalum products are covered by the Federal effluent guidelines (ELGs) promulgated under 40 CFR Part 421 – Nonferrous Metals Manufacturing Point Source Category. In particular, Subpart K – primary Niobium - Tantalum Subcategory.

As stated previously, this facility is now involved in the pumping and treatment of contaminated groundwater. They no longer produce Niobium – Tantalum, and ELGs have not been promulgated for this type of activity.

The technology-based concentration limits carried forward in this draft permit were established in accordance with 40 CFR Part 421 Subpart K and 40 CFR § 122.44(1), when the facility was in full operation (production of Niobium and Tantalum), and maintained on the subsequent permits after the facility discontinued production. Additionally, to ensure that the facility does not discharge pollutants at harmful concentrations that will impair



the receiving waterbody, the technology-based concentration limitations in the previous permits will also be carried over to this draft permit.

### **C. BEST PROFESSIONAL JUDGMENT (BPJ)-BASED LIMITATIONS**

The previous permit did not contain any BPJ-based effluent limitations.

### **D. VARIANCES**

No request for a variance was received.

## **V. WATER QUALITY-BASED EFFLUENT LIMITATIONS AND CONDITIONS**

### **A. GENERAL**

Section 101 of the Clean Water Act (CWA) states that "... it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited..." A permit containing technology-based permit limitations alone may not adequately protect the quality of a specific receiving stream. Thus, additional water quality-based effluent limitations and/or conditions are considered in the draft permit using narrative and numerical standards contained in the Oklahoma Water Quality Standards (OWQS), as amended (OAC 785:45), and implementation criteria contained in OACs 785:46 and 252:690, promulgated by the Oklahoma Water Resources Board (OWRB) and Department of Environmental Quality (DEQ), respectively. This is to ensure that no point-source discharge results in instream aquatic toxicity, a violation of applicable narrative or numerical State water quality standards, or aquatic bioaccumulation which threatens human health.

### **B. RECEIVING STREAM DESIGNATED USES AND ANTIDegradATION PROVISIONS**

#### **1. Outfall 001**

Outfall 001 discharges to the Arkansas River (WBID 120400010260\_00) in Segment 120400 of the Middle Arkansas River Basin. As designated in Appendix A of the OWQS, the designated uses of the Arkansas River in this segment are:

Emergency Public and Private Water Supply (OAC 785:45-5-11);  
Fish and Wildlife Propagation/Warm Water Aquatic Community (OAC 785:45-5-12);  
Agriculture (OAC 785:45-5-13);  
Primary Body Contact Recreation (OAC 785:45-5-16);  
Navigation (OAC 785:45-5-18);  
Aesthetics (OAC 785:45-5-19); and  
Fish Consumption (OAC 785:45-5-20).

#### **2. Antidegradation Provisions**

This segment of the Arkansas River is not designated as an Outstanding Resource Water (ORW), High Quality Water (HQW), or Sensitive Water Supply (SWS) in Appendix A of the OWQS. This segment is designated in Table 1 of Appendix B of the OWQS as an area of ecological and/or recreational significance. However, as this is an existing discharging facility that has decreased their discharge flow, no further protective measures will need to be implemented in accordance with OAC 785:46-13-6(b). This segment of the Arkansas River is not listed in Table 2 of Appendix B as an area containing federally-listed endangered species.



## C. WATER QUALITY STANDARDS IMPLEMENTATION

### 1. Water Quality Standards Implementation Process

To achieve the objectives stated in Section V.A above, each pollutant present at measurable levels in the facility's effluent or which has technology-based concentration limitations, for which there is one or more applicable numerical water quality criteria, is screened against the applicable numerical criteria to determine whether the pollutant has reasonable potential (RP) to exceed any of the criteria. The screens are performed in accordance with the OWQS, OWQS implementation criteria in OAC 785:46 and OAC 252:690, and the Continuing Planning Process (CPP) document. In the RP screening process, the 95<sup>th</sup> percentile effluent concentration, or estimate thereof if the effluent data set is not sufficiently large to determine it directly, is used to compute an instream concentration according to regulatory mixing zone equations defined in OAC 785:46. Calculated instream concentrations are then compared with applicable criteria to determine whether RP is exhibited for any of the screened pollutants. If RP is exhibited, in accordance with 40 CFR 122.44(d)(1)(vi) and OAC 252:690, a wasteload allocation and criterion long term average is computed for each applicable criterion. Water quality-based permit limitations are calculated for each pollutant exhibiting RP for all applicable criteria. The most stringent of the resulting monthly average permit limitations is established in the draft permit for each pollutant requiring such limitations.

### 2. Summary of Regulatory Parameters

Regulatory receiving water flows are established in OAC 785:46. Effluent regulatory flows, as well as regulatory effluent and background pollutant concentrations are established in OAC 252:690, Subchapter 3. Definitions and values for these terms are as follows:

#### a. Effluent and Upstream Receiving Water Regulatory Flows

- |              |  |
|--------------|--|
| $Q_{e(30)}$  | High 30-day average effluent flow rate over the two-year period of record. Value of $Q_{e(30)}$ for Outfall 001 is described in Section III.B.1.   |
| $Q_{e(LTA)}$ | Long term average effluent flow rate over the two-year period of record. Value of $Q_{e(LTA)}$ for Outfall 001 is described in Section III.B.1.  |
| $Q_{u(7Q2)}$ | Upstream 7Q2 flow rate. This is the annual 7-day, 2-year low flow of the receiving stream. Where streamflow data is published in the USGS publication, <u>Statistical Summaries of Streamflow in and near Oklahoma Through 2007</u> , by Lewis, J.M., and Esralew, R.A., 2009, minor adjustments for known upstream or downstream perennial flows and/or withdrawals, as appropriate, may be utilized to estimate the 7Q2 for a specific location upstream or downstream of the USGS gaging station. Where additional USGS published flow data is available, the 7Q2 may be calculated in accordance with OAC 785:46-1-6. If streamflow is intermittent, if USGS 7Q2 data is not available, or if the applicant has not developed a site-specific 7Q2, a default value of 1 cfs (0.6463 MGD) is assumed. |
| $Q_{u(LTA)}$ | Upstream long-term average flow rate. This is the mean annual flow of the receiving stream. Where streamflow data is published in the USGS publication, <u>Statistical Summaries of Streamflow in and near Oklahoma Through 2007</u> , by Lewis, J.M., and Esralew, R.A., 2009, minor adjustments for known upstream or downstream perennial flows and/or withdrawals, as appropriate, may be utilized to estimate the mean annual flow for a specific location upstream or downstream of the USGS gaging station. If published mean annual flow data is not available, it may be approximated by multiplying the receiving water's drainage area at the point of discharge by the mean annual runoff per unit   |



area published in the CPP. The  $Q_{u(LTA)}$  for the Agriculture beneficial use for the yearly mean standard (YMS) shall be the greater of the  $Q_{u(LTA)}$  or 1.47 cfs (0.9501 MGD).

**$Q_{u(STA)}$**  Upstream short-term average flow rate. This flow rate, used only in the sample standard (SS) agriculture screen, is a function of  $Q_{u(LTA)}$ . The equation is  $Q_{u(STA)} = 0.68 \times Q_{u(LTA)}$ . The  $Q_{u(STA)}$  shall be the greater of the  $Q_{u(STA)}$  or 1.0 cfs (0.6463 MGD).

Upstream flow for Outfall 001 is established as shown in the following table. Upstream flows for the Arkansas River are based on published data for USGS gaging station 07194500, located on the Arkansas River northeast of the town of Muskogee and adjacent to the Hwy 62 bridge, approximately 1.7 miles downstream of the confluence of Neosho River with the Arkansas River and approximately 900 feet downstream of the facility's point of discharge (POD) for Outfall 001. There are no significant perennial flow contributions between the gaging station and the Outfall 001 POD.

**Upstream Regulatory Flows (MGD)  
Arkansas River at Outfall 001**

Flowstream	$Q_{u(7Q2)}$	$Q_{u(LTA)}$	$Q_{u(STA)}$
Arkansas River at Station 07194500 (near Muskogee)	1409	13,962	9494

<sup>a</sup>  $Q_{u(STA)} = 0.68 \times Q_{u(LTA)}$  or 0.6463 MGD, whichever is greater.

**b. Flow Dilution Ratios ( $Q^*$ )**

$Q^*$  Ratio of effluent flow to stream flow, also known as dilution capacity. The  $Q^*$  ratios for industrial discharges, as well as their values, are defined in the following table.

**$Q^*$  Values for Outfall 001**

$Q^*$ Ratio	Corresponding Water Quality Screens	Implementation Reference	$Q^*$ Value
			Outfall 001
$Q_{e(30)}/Q_{u(7Q2)}$	Chronic Toxicity	OAC 252:690-3-53(1)(A)	0.00023
	Temperature	OAC 252:690-3-46(1)	0.00023
$Q_{e(30)}/Q_{u(LTA)}$	Raw Water Column	OAC 252:690-3-73(1)(B)	0.00002
$Q_{e(LTA)}/Q_{u(LTA)}$	Human Health/Fish Flesh	OAC 252:690-3-66(1)	0.00002
	Human Health/Fish Flesh & Water	OAC 252:690-3-73(1)(A)	0.00002
$Q_{e(LTA)}/Q_{u(LTA)}$ <sup>a</sup>	Agriculture/Yearly Mean Standard	OAC 252:690-3-81(1)(A)	0.00002
$Q_{e(30)}/Q_{u(STA)}$ <sup>b</sup>	Agriculture/Sample Standard	OAC 252:690-3-81(2)(A)	0.00003

<sup>a</sup>  $Q_{u(LTA)}$  for the Agriculture/Yearly Mean Standard is the greater of the  $Q_{u(LTA)}$  or 0.9501 MGD.

<sup>b</sup>  $Q_{u(STA)}$  for the Agriculture/Sample Standard is the greater of the  $Q_{u(STA)}$  or 0.6463 MGD.

**c. Characterization of Pollutant Effluent Concentrations**

**$C_{mean}$**  Either the geometric mean or arithmetic average of an effluent data set, depending on the nature of the effluent data set.  $C_{mean}$  is calculated as a geometric mean if the full effluent data set for a pollutant is available. A full effluent data set is to consist of at least ten data points, and at least five of those data points are measurable. Otherwise,  $C_{mean}$  is calculated as an arithmetic average from the available data. Where a data set is unavailable, a long-term average submitted in an application (Form 2C) is assumed to

be an arithmetic average (OAC 785:46-9-5(b)). If only one data point is available, it represents  $C_{\text{mean}}$ .

$C_{\text{max}}$

The highest concentration in an effluent data set. If only one data point is available, it represents  $C_{\text{max}}$ .

$C_{95}$

The 95<sup>th</sup> percentile effluent concentration of a pollutant for the purpose of assessing whether water quality-based effluent limitations are required for that pollutant. If at least 10 data points are available, at least five of which are measurable,  $C_{95}$  is calculated directly from the effluent data set assuming a log-normal distribution according to the following equation:

$$C_{95} = \text{EXP}(\ln(x)_{\text{avg}} + 1.645 \times s_{\ln(x)})$$

where

- $\ln(x)_{\text{avg}}$ , represents the arithmetic average of the set of log-transformed data points.

$$\ln(x)_{\text{avg}} = \frac{\sum_{i=1}^N \ln(x_i)}{N}$$

- $s_{\ln(x)}$ , represents the standard deviation of the set of log-transformed data points.

$$s_{\ln(x)} = \sqrt{\frac{N \sum_{i=1}^N [\ln(x_i)^2] - \left[ \sum_{i=1}^N \ln(x_i) \right]^2}{N(N-1)}}$$

If less than 10 effluent data points are available ( $N < 10$ ),  $C_{95}$  must be estimated from the available data according to the following equation:

$$C_{95} = C_{\text{mean}} \times 2.135$$

$C_{95(M)}$

The 95<sup>th</sup> percentile maximum likelihood effluent concentration for purposes of determining whether additional effluent monitoring is required, calculated using the “TSD method.” The TSD method is based on the methodology in Section 3.3.2 of Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001.  $C_{95(M)}$  is calculated according to the following equation:

$$C_{95(M)} = C_{\text{max}} \times \text{RPF}_{95(M)}$$

$\text{RPF}_{95(M)}$

$\text{RPF}_{95(M)}$  is calculated, assuming a log-normal distribution, according to the following equation:

$$\text{RPF}_{95(M)} = \frac{\text{EXP}\left[1.645 \sqrt{\ln(1 + CV^2)} - 0.5 \ln(1 + CV^2)\right]}{\text{EXP}\left[z_N \sqrt{\ln(1 + CV^2)} - 0.5 \ln(1 + CV^2)\right]}$$



where  $z_N$  is the upper  $k^{\text{th}}$  percentile of the normal distribution,  $k = 0.05^{1/N}$  (for the 95% confidence level), and CV is assumed to equal 0.6.

The values of  $z_N$  and the resulting value of  $RPF_{95(M)}$  for values of N from 1 to 9 are shown in the following table:

N	1	2	3	4	5	6	7	8	9
$z_N$	-1.645	-0.760	-0.336	-0.068	0.124	0.272	0.390	0.489	0.574
$RPF_{95(M)}$	6.199	3.795	3.000	2.585	2.324	2.141	2.006	1.898	1.811

**C<sub>e</sub>** Effluent concentration. The geometric mean reported on Form 2C. If only one value is available, it will be considered to be the geometric mean. If only average values are available, the arithmetic mean of the average values will be used.

**CV** Coefficient of variation of a data set. CV is defined as the standard deviation of a data set divided by its arithmetic average, i.e.,  $CV = s_x/C_{avg}$ . Standard deviation of a data set  $s_x$  is calculated according to the following equation.

$$s_x = \sqrt{\frac{N \sum_{i=1}^N (x_i^2) - \left( \sum_{i=1}^N x_i \right)^2}{N(N-1)}}$$

Where fewer than 10 data points are available, a default CV value of 0.6 is assumed.

**C<sub>mean</sub>, C<sub>max</sub>, C<sub>95</sub>, C<sub>95(M)</sub>, and CV Values for Quantifiable Pollutants**

Effluent Characteristic	No. of data pts (N)	Concentration (µg/L unless otherwise specified)				Calculated CV <sup>a</sup>
		C <sub>mean</sub>	C <sub>95</sub>	C <sub>max</sub>	C <sub>95(M)</sub>	
Ammonia (mg/L)	5	0.951	--	2.81	--	--
Fluoride (mg/L)	8	8.08	17.25	24	45.55	--
Nitrate-Nitrite (as N) (mg/L)	6	1.2	2.56	1.8	3.85	--
Arsenic, total	1	76	162.26	76	471.12	--
Lead, total	8	0.01	0.01	0.01	0.02	--
Chlorides	1	45.6	97.36	45.6	282.67	
Sulfates	1	513	1095.26	513	3180.09	
Total Dissolved Solids (TDS)	6	928.6	1982.56	1290	2761.89	

<sup>a</sup> A coefficient of variation (CV) is calculated only where an effluent data set consists of at least ten data points. At least half of these data points must be measurable. A CV value of 0.6 is otherwise assumed where a data set is of insufficient size or there is an insufficient number of measurable data points to calculate a CV directly (see OAC 252:690-3-7).

**d. Pollutant Background Concentrations**

**C<sub>b</sub>** Upstream or background concentration of a pollutant. Specific data is used where available. Where such data is not available, and in streams where  $Q_{u(7Q2)} = 0$  in the absence of known upstream toxicants, background concentrations are assumed to be zero. For the agriculture screens,  $C_b$  is computed using the segment average YMS and SS values for the receiving stream segment

published in Appendix F to OAC 785:45 according to the following equation:  $C_b = 2 \times YMS - SS$ . Background levels are described in the following table.

**Background Concentrations of Pollutants Present in Outfall 001 Effluent  
Arkansas River above Outfall 001**

Pollutant	No. of Data Pts (N)	Background Conc ( $C_b$ ) (mg/L unless otherwise specified)	Data Source
Ammonia	---	Assumed zero <sup>a</sup>	---
Fluoride	---	Assumed zero <sup>a</sup>	---
Nitrate-Nitrite (as N)	---	Assumed zero <sup>a</sup>	---
Arsenic, total	---	Assumed zero <sup>a</sup>	---
Lead, total	---	Assumed zero <sup>a</sup>	---
Chlorides	---	248	Segment Average <sup>b</sup>
Sulfates	---	74	Segment Average <sup>b</sup>
Total Dissolved Solids (TDS)	---	454	Segment Average <sup>b</sup>

<sup>a</sup> No background data available. Background level is assumed to be zero in accordance with OAC 252:690-3-11(c).  
<sup>b</sup> Since no site-specific background data is available, background is calculated from segment-averaged YMS and SS criteria in accordance with OAC 252:690-3-16(a). For chlorides,  $C_b = 2 \times 398 - 548 = 248$  mg/L. For sulfates,  $C_b = 2 \times 104 - 134 = 74$  mg/L. For TDS,  $C_b = 2 \times 726 - 998 = 454$ .

**e. Other Applicable Terminology**

**$C_{\text{criterion}}$**  Numerical water quality criterion for a specific pollutant. For some pollutants, aquatic toxicity criteria are pH- or hardness-dependent. In such cases, in accordance with OAC 785:46-5-8, site-specific pH or hardness data, if available, may be used. If site-specific pH or hardness data is not available, the segment averaged pH or hardness from OAC 785:46, Appendix B, is used. Where a specific pollutant screen exhibits reasonable potential,  $C_{\text{criterion}}$  is used to calculate the wasteload allocation (WLA). Criteria applicable to the discharges from this facility are as follows:

- Fish and wildlife propagation (F&WP) use
  - $C_A$ : Acute toxicity criterion
  - $C_C$ : Chronic toxicity criterion
- Fish consumption use
  - $C_{FF}$ : Human health criterion for the consumption of fish flesh
- Public and private water supply (PPWS) use
  - $C_{RAW}$ : Raw water column criterion
  - $C_{FFW}$ : Human health criterion for the consumption of fish flesh and water
- Agriculture use
  - $C_{YMS}$ : Yearly mean standard
  - $C_{SS}$ : Sample standard

**$C_d$**  Instream concentration of a specific pollutant, according to the appropriate mixing equation.



## **D. WATER QUALITY-BASED REQUIREMENTS**

### **1. Criteria for Protection of the Fish and Wildlife Propagation Use (Outfall 001)**

#### **a. DO and DO-Demanding Substances**

OAC 785:45-5-12(f)(1) requires that where DO-demanding substances are present in an effluent at significant levels, a WLA must be established according to certain seasonal criteria dependent on the receiving water's aquatic community subcategory. Once such WLAs are given technical approval by EPA, a Water Quality Management Plan (WQMP) amendment is publicly noticed. When the WQMP amendment is given final EPA approval, it may then be incorporated into an OPDES permit. For purposes of establishing permit limitations for DO-demanding substances for industries, the monthly average limit (MAL) in the draft permit for each effluent characteristic is set equal to the corresponding WLA concentration, and a daily maximum limit (DML) is set equal to 1.5 times the WLA concentration.

#### **b. pH**

OAC 785:45-5-12(f)(3) states, "pH values shall be between 6.5 and 9.0 in waters designated for fish and wildlife propagation; unless pH values outside that range are due to natural conditions." This pH range is established in the draft permit.

#### **c. Oil and Grease**

OAC 785:45-5-12(f)(4) states, "All waters having the designated beneficial use of any subcategory of fish and wildlife propagation shall be maintained free of oil and grease to prevent a visible sheen of oil or globules of oil or grease on or in the water. Oil and grease shall not be present in quantities that adhere to stream banks and coat bottoms of water courses or which cause deleterious effects to the biota." A narrative (water quality-based) condition prohibiting the discharge of any visible sheen of oil or globules of oil or grease will be included in the draft permit.

#### **d. Toxicity from Halogenated Oxidants**

OAC 785:46-3-1(c) states: "Toxicity from halogens (e.g., chlorine, bromine and bromochloro compounds) will be controlled by dehalogenation rather than WET testing. However, use of dehalogenation shall not exempt an effluent from the WET testing requirements of this chapter." Chapter 2, Part III of the CPP implements this narrative criterion as follows: "The requirement of OAC 785:46-3-1(c) for dehalogenation is typically implemented as "no measureable amount in the effluent." "No measureable amount" is defined by DEQ to be < 0.1 mg/L.

#### **e. Ammonia Toxicity**

##### **(1) Criterion and Implementation**

Interim implementation for controlling ammonia toxicity is described in OAC 785:46 and OAC 252:690. OAC 785:46-5-3(b)(5) states, "For regulatory purposes, there is a reasonable potential for chronic toxicity if concentrations of ammonia outside the chronic regulatory mixing zone exceed 6 mg/L." An interim implementation procedure for acute toxicity from ammonia has not yet been developed.

The facility has ammonia limits that will be carried over to this permit from the previous permit. The levels of ammonia that are being discharged do not show reasonable potential to exceed the criteria for chronic toxicity outside the regulatory mixing zone.

**f. Whole Effluent Toxicity (Outfall 001)**

**(1) Criterion and Implementation**

Whole effluent toxicity (WET) testing is the most direct measure of potential aquatic toxicity, since it incorporates the effects of synergism of effluent components and receiving stream water quality characteristics. OAC 785:45-5-12(f)(6)(A) states, "Surface waters of the state shall not exhibit acute toxicity and shall not exhibit chronic toxicity outside the [chronic] mixing zone. Acute test failure and chronic test failure shall be used to determine discharger compliance with these narrative aquatic life toxics criteria." This narrative toxicity criterion is implemented according to procedures described at OAC 785:46, Subchapter 3, OAC. 252:690-3-17 through 3-43, and Chapter 3 of the CPP.

Two types of WET tests are used to implement the narrative toxicity criterion. The 48-hour acute test is used to protect against acute toxicity, and the 7-day chronic test is used to protect against chronic toxicity outside the chronic regulatory mixing zone. Two test species are used: a vertebrate species, *Pimephales promelas* (or Fathead minnow), and an invertebrate species, *Daphnia pulex* (for acute testing) or *Ceriodaphnia dubia* (for chronic testing).

**(2) WET Testing Historical Summary**

**(a) Outfall TX1**

Outfall TX1 is functionally identical to Outfall 001. The previous permit required acute only WET testing of the *Daphnia pulex* and Fathead minnow species on a quarterly basis. The previous permit also established a WET limit for *Daphnia pulex*.

**(i) Acute Testing**

Acute testing was conducted using a critical dilution of 100% and a 0.75 dilution series. In the following summary table, where a test failed, the LC<sub>50</sub> value is shown **underlined in bold face**.



**Summary of Acute WET Test Results by Species (Outfall 001)  
July 2015 through December 2019**

<i>Daphnia pulex (D. pulex)</i>			<i>Fathead minnows (P. promelas)</i>		
Date	LC50 <sup>a</sup>	WET/22414*	Date	LC50 <sup>a</sup>	WET/22414*
7/1/15 to 9/30/15	> 100%	> 100%	7/1/15 to 9/30/15	> 100%	N/A
10/1/15 to 12/31/15	> 100%	> 100%	10/1/15 to 12/31/15	> 100%	N/A
1/1/16 to 3/31/16	> 100%	> 100%	1/1/16 to 3/31/16	> 100%	N/A
4/1/16 to 6/30/16	> 100%	> 100%	4/1/16 to 6/30/16	> 100%	N/A
7/1/16 to 9/30/16	> 100%	> 100%	7/1/16 to 9/30/16	> 100%	N/A
10/1/16 to 12/31/16	> 100%	> 100%	10/1/16 to 12/31/16	> 100%	N/A
1/1/17 to 3/31/17	No Discharge	No Discharge	1/1/17 to 3/31/17	No Discharge	N/A
4/1/17 to 6/30/17	> 100%	> 100%	4/1/17 to 6/30/17	> 100%	N/A
7/1/17 to 9/30/17	No Discharge	No Discharge	7/1/17 to 9/30/17	No Discharge	N/A
10/1/17 to 12/31/17	> 100%	> 100%	10/1/17 to 12/31/17	INVALID	N/A
-----	-----	-----	REPEAT TEST	>100%	N/A
1/1/18 to 3/31/18	> 100%	> 100%	1/1/18 to 3/31/18	> 100%	N/A
4/1/18 to 6/30/18	No Discharge	No Discharge	4/1/18 to 6/30/18	No Discharge	N/A
7/1/18 to 9/30/18	> 100%	> 100%	7/1/18 to 9/30/18	> 100%	N/A
10/1/18 to 12/31/18	> 100%	> 100%	10/1/18 to 12/31/18	> 100%	N/A
1/1/19 to 3/31/19	> 100%	> 100%	1/1/19 to 3/31/19	> 100%	N/A
4/1/19 to 6/30/19	> 100%	> 100%	4/1/19 to 6/30/19	> 100%	N/A
7/1/19 to 9/30/19	No Discharge	No Discharge	7/1/19 to 9/30/19	No Discharge	N/A
10/1/19 to 12/31/19	> 100%	> 100%	10/1/19 to 12/31/19	> 100%	N/A

<sup>a</sup> LC<sub>50</sub>'s reported in percent effluent. An LC<sub>50</sub> ≤ 100 % constitutes a test failure.

<sup>b</sup> Retest data not available through PCS data retrieval. WET test reports on file examined for retest results.

### **(3) Reasonable Potential**

#### **(a) Criteria for Reasonable Potential**

According to 40 CFR 122.44(d)(1)(v), when the permitting authority determines that a discharge causes, has the reasonable potential (RP) to cause, or contributes to an in-stream excursion above a narrative criterion within an applicable State water quality standard for whole effluent toxicity, the permit must contain effluent limits for whole effluent toxicity.

In accordance with the narrative criteria established in OAC 785:46-3-5 and cited by reference in OAC 252:690-3-18, RP exists whenever persistent lethality is demonstrated. In addition, the OAC 785:46-3-5 states that the permitting authority may deem RP to be demonstrated whenever intermittent toxicity or persistent toxicity occurs. Persistent toxicity (lethality and/or sublethality) is defined in OAC 252:690-1-2 as repeat failure (failure of the routine test plus one of the two monthly retests) of an acute or chronic WET test and intermittent toxicity is defined as two or more lethal or sublethal effect test failures of a routine acute or chronic WET test within any 18-month period. OAC 252:690-3-19(a) requires a toxicity reduction evaluation (TRE) when persistent toxicity is demonstrated. In accordance with OAC 252:690-3-19(b) the effective date of a WET limit for the affected species may be deferred up to three years from the effective date of the permit.

#### **(b) Application of Criteria to the Draft Permit and Permitting Actions**

Above summary of WET testing since the effective date of the previous permit shows no sublethal failure of either *C. dubia* or fathead minnows. The previous permit had quarterly biomonitoring for *C. dubia* and fathead minnows; this quarterly biomonitoring for *C. dubia* and fathead minnows will not be continued in the draft permit. The facility's status was changed with EPA's consent to a "Minor" using the NPDES Permit Rating Worksheet score system on February 13, 2020, so biomonitoring is not required under OAC 252:690-3-31. Thus, the WET testing requirements will not be carried over to the draft permit.

### **(4) Whole Effluent Toxicity Testing Requirements**

None

#### **g. Temperature**

There is no addition of heat from artificial sources to the water discharged at Outfall 001. Thus, no additional permit action is required.

## **2. Aquatic Toxicity, Human Health, and Raw Water Column Criteria for Toxic Substances for Protection of the Fish and Wildlife Propagation, Fish Consumption and Public and Private Water Supply Uses**

#### **a. Criteria and Implementation**

##### **(1) Aquatic Toxicity– Fish and Wildlife Propagation Use**

Acute and chronic aquatic toxicity numerical criteria are specified at OAC 785:45-5-12(f)(6)(G) and are implemented according to procedures in OAC 785:46, Subchapter 5, OAC. 252:690-3-51 through 3-57, and Chapter 3 of the CPP.



Aquatic toxicity numerical criteria are hardness-dependent for certain metals. The equations for calculating hardness-dependent criteria (for those metals present at quantifiable levels in the discharge) and the resulting acute and chronic criteria are shown in the following table. Since no site-specific background hardness data are available, the segment-averaged hardness is used to calculate hardness-dependent aquatic toxicity criteria.

### Hardness-dependent Aquatic Toxicity Criteria for Arkansas River (Outfall 001)

Effluent Characteristic	Acute Toxicity Criteria		Chronic Toxicity Criteria	
	Equation	Value (µg/L) <sup>(1)</sup>	Equation	Value (µg/L) <sup>(1)</sup>
Arsenic III, total <sup>(2)</sup>	---	340	---	150
Lead, total	$C_{acute} = e^{(1.273 (\ln (\text{hardness})) - 1.460)}$	194.05	$C_{chronic} = e^{(1.273 (\ln (\text{hardness})) - 4.705)}$	7.56

<sup>(1)</sup> Based on segment-averaged hardness of 197.40 mg/L.

<sup>(2)</sup> Criteria for Arsenic III, total will be used as baseline criteria for Arsenic, total.

### (2) Protection of Human Health for Consumption of Fish Flesh – Fish Consumption Use

Criteria for the protection of human health for the consumption of fish flesh apply only to receiving waters not designated as habitat-limited aquatic communities. Additional human health/fish flesh criteria are recommended by EPA in the National Recommended Water Quality Criteria (NRWQC). NRWQC criteria are not binding upon individual states, however. OWQS and NRWQC criteria for the protection of human health for the consumption of fish flesh are specified at OAC 785:45-5-20(b) and Publication No. EPA 822-Z-99-001, respectively, and are implemented according to the procedures in OAC 785:46, Subchapter 7, OAC 252:690-3-64 through 3-70, and Chapter 3 of the CPP.

### (3) Protection of Raw Water Column and Human Health for Consumption of Fish Flesh and Water – Public and Private Water Supply Use

OWQS raw water column criteria and criteria for the protection of human health for the consumption of fish flesh and water are specified at OAC 785:45-5-10(1) and 785:45-5-10(6), respectively, and are implemented according to the procedures in OAC 785:46, Subchapter 7, OAC 252:690-3-71 through 3-77, and Chapter 3 of the CPP. These criteria apply only to receiving waters specifically designated in OAC 785:45, Appendix A, for the Public and Private Water Supply (PPWS) use.

### b. Determination of Reasonable Potential and Wasteload Allocation

#### (1) Reasonable Potential and WLA Equations

##### (a) Aquatic Toxicity– Fish and Wildlife Propagation Use

For determining whether there is reasonable potential to exceed acute toxicity numerical criteria for discharges to streams, OAC 785:46-5-3(b)(2) defines a pollutant's concentration at the edge of the acute regulatory mixing zone ( $C_d$ ) as:

$$C_d = C_b + \frac{Q_{e(30)}}{64.63} (C_{95} - C_b), \text{ where } Q_{e(30)} \text{ is expressed in MGD.}$$

In order for the acute mixing zone equation to be mathematically well-behaved, i.e., for  $C_d$  to fall in the range between  $C_b$  and  $C_{95}$ , the value for  $Q_{e(30)}$  used in the acute mixing equation is limited to a maximum value of 64.63 MGD, even if the actual  $Q_{e(30)}$  exceeds 64.63 MGD.

Should a pollutant's acute toxicity screen exhibit reasonable potential, a water quality-based limit is required for that pollutant and a wasteload allocation is calculated for each applicable criterion. For discharges to streams, the acute toxicity wasteload allocation is calculated in accordance with OAC 252:690-3-55(a)(1), as follows:

$$WLA_A = C_b + \frac{64.63}{Q_{e(30)}} (C_A - C_b), \text{ where } Q_{e(30)} \text{ is expressed in MGD.}$$

As with the reasonable potential equation, if the actual  $Q_{e(30)}$  exceeds 64.63 MGD, a maximum value of 64.63 MGD is used in the acute WLA equation.

For determining whether there is reasonable potential to exceed chronic toxicity numerical criteria, OAC 785:46-5-3(b)(2) defines a pollutant's maximum concentration at the boundary of the chronic regulatory mixing zone ( $C_d$ ) as:

$$C_d = C_u + 1.94 Q^* \frac{(C_{95} - C_u)}{(1 + Q^*)}, \text{ for } Q^* \leq 0.1823$$

$$C_d = C_u + \frac{(C_{95} - C_u)}{(6.17 - 15.51 Q^*)}, \text{ for } 0.1823 < Q^* < 0.3333$$

$$C_d = C_{95}, \text{ for } Q^* \geq 0.3333$$

Should a pollutant's chronic toxicity screen exhibit reasonable potential, a water quality-based limit is required for that pollutant and a wasteload allocation is calculated for each applicable criterion. For discharges to streams, the chronic toxicity wasteload allocation is calculated in accordance with OAC 252:690-3-55(a)(1), as follows:

$$WLA_C = C_u + \left( \frac{1 + Q^*}{1.94 Q^*} \right) (C_C - C_u), \text{ for } Q^* \leq 0.1823$$

$$WLA_C = C_u + (6.17 - 15.51 Q^*) (C_C - C_u), \text{ for } 0.1823 < Q^* < 0.3333$$

$$WLA_C = C_C, \text{ for } Q^* \geq 0.3333$$

#### **(b) Protection of Human Health for Consumption of Fish Flesh – Fish Consumption Use**

OAC 785:46-7-3(b)(1) defines the reasonable potential equation for a pollutant's instream concentration  $C_d$  after complete mixing as follows:

$$C_d = \frac{(C_{95} Q^* + C_b)}{(1 + Q^*)}$$



The human health/fish flesh wasteload allocation is calculated in accordance with OAC 252:690-3-68, as follows:

$$WLA_{FF} = C_{FF} + \frac{(C_{FF} - C_b)}{Q^*}$$

Should a pollutant's OWQS human health/fish flesh screen exhibit reasonable potential, a water quality-based limit is required for that pollutant and a wasteload allocation is calculated for each applicable criterion.

In accordance with EPA Region 6 policy, pollutants are screened for reasonable potential to exceed NRWQC human health/fish flesh consumption criteria. If reasonable potential is exhibited for a pollutant and there is no applicable state water quality criterion of any kind for that pollutant, effluent monitoring of the pollutant is required for a limited period of time as a permit condition in lieu of establishing effluent limitations.

**(c) Protection of Raw Water Column and Human Health for Consumption of Fish Flesh and Water – Public and Private Water Supply Use**

OAC 785:46-7-3(b)(2) defines the reasonable potential equation for a pollutant's instream concentration  $C_d$  after complete mixing as follows:

$$C_d = \frac{(C_{95} Q^* + C_b)}{(1 + Q^*)}$$

Raw water column and human health/fish flesh and water wasteload allocations are calculated in accordance with OAC 252:690-3-75, as follows:

$$WLA_{Raw} = C_{Raw} + \frac{(C_{Raw} - C_b)}{Q^*}, \text{ for the raw water column criterion, and}$$

$$WLA_{FFW} = C_{FFW} + \frac{(C_{FFW} - C_b)}{Q^*}, \text{ for the human health/fish flesh and water criterion.}$$

**(2) Results of Reasonable Potential Screening**

**(a) Aquatic Toxicity– Fish and Wildlife Propagation Use**

Results of the acute and chronic toxicity screen for Outfall 001, using  $Q_{e(30)}$  values in Section III.B.1,  $Q_{u(7Q2)}$  values in Section V.C.2.a,  $C_{95}$  values in Section V.C.2.c, pollutant background levels in Section V.C.2.d, and applicable hardness-dependent metals toxicity criteria reflected in Section V.D.2.a(1), are shown in the following tables. Any required WLAs are also shown. Where water quality-based permit limitations are required, results are shown in **bold face**.

**Results of Acute and Chronic Toxicity RP Screens**  
(concentrations in µg/L unless otherwise specified)

Effluent Characteristic	Acute Toxicity				Chronic Toxicity			
	C <sub>d</sub>	C <sub>A</sub>	C <sub>d</sub> > C <sub>A</sub> ?	WLA <sub>A</sub>	C <sub>d</sub>	C <sub>C</sub>	C <sub>d</sub> > C <sub>C</sub> ?	WLA <sub>C</sub>
Arsenic, total	0.80	340 <sup>a</sup>	No	N/A	0.07	150 <sup>a</sup>	No	N/A
Lead, total	0.00	194.05	No	N/A	0.00	7.56	No	N/A

<sup>a</sup> Criteria for Arsenic III, total

**(b) Protection of Human Health for Consumption of Fish Flesh – Fish Consumption Use**

Results of the OWQS and NRWQC human health/fish flesh screen for Outfall 001, using Q<sub>e(LTA)</sub> values in Section III.B.1, Q<sub>u(LTA)</sub> values in Section V.C.2.a, C<sub>95</sub> values in Section V.C.2.c, and background levels in Section V.C.2.d, are shown in the following tables. Any required OWQS WLAs are also shown.

No permit limitations are required for this criteria.

**c. Criterion Long Term Average (LTA) Concentration**

**(1) Aquatic Toxicity– Fish and Wildlife Propagation Use**

Acute and chronic toxicity criteria LTAs (LTA<sub>A</sub> and LTA<sub>C</sub>) are calculated for the pollutants requiring water quality-based limits assuming a log-normal distribution and using a 99% probability basis according to the following equations. A CV of 0.6 is assumed where the effluent data set for a pollutant is not sufficiently large to determine a CV directly.

$$LTA_A = WLA_A \times \text{EXP} \left( 0.5 \ln(1 + CV^2) - 2.326 \sqrt{\ln(1 + CV^2)} \right)$$

$$LTA_C = WLA_C \times \text{EXP} \left( 0.5 \ln \left( 1 + \frac{CV^2}{4} \right) - 2.326 \sqrt{\ln \left( 1 + \frac{CV^2}{4} \right)} \right)$$

**(2) Protection of Human Health for Consumption of Fish Flesh – Fish Consumption Use**

For the human health/fish flesh criterion, LTA<sub>FF</sub> = WLA<sub>FF</sub>. Human health/fish flesh criterion long term average concentrations for pollutants requiring water quality-based limits are shown in the following table: None.

**(3) Protection of Raw Water Column and Human Health for Consumption of Fish Flesh and Water – Public and Private Water Supply Use**

For both raw water column and human health/fish flesh and water criteria, LTA = WLA. Raw water column and human health/fish flesh and water criteria long term average concentrations for pollutants requiring water quality-based limits are shown in the following table: None.



**d. Permit Limitations**

**(1) Aquatic Toxicity– Fish and Wildlife Propagation Use (Outfall 001)**

Aquatic toxicity-based monthly average limits ( $MAL_{TOX}$ ) are calculated on a 95% probability basis, and aquatic toxicity-based daily maximum limits ( $DML_{TOX}$ ) are calculated on a 99% probability basis. In accordance with OAC 252:690-3-89, a monitoring frequency ( $N_m$ ) of 2/month is utilized, and a CV of 0.6 is assumed where the effluent data set for a pollutant is not sufficiently large to determine a CV directly. The permit limit equations are:

$$MAL_{TOX} = LTA_{TOX} \times \exp \left( 1.645 \sqrt{\ln \left( 1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left( 1 + \frac{CV^2}{N_m} \right) \right)$$

$$DML_{TOX} = LTA_{TOX} \times \exp \left( 2.326 \sqrt{\ln (1 + CV^2)} - 0.5 \ln (1 + CV^2) \right)$$

No toxicity-based permit limitations required.

**(2) Protection of Human Health for Consumption of Fish Flesh – Fish Consumption Use**

Human health/fish flesh-based monthly average limits ( $MAL_{FF}$ ) are equal to the respective criterion long term averages, and daily maximum limits ( $DML_{FF}$ ) are calculated on a 99% probability basis. In accordance with OAC 252:690-3-89, a monitoring frequency ( $N_m$ ) of 2/month is utilized, and a CV of 0.6 is assumed where the effluent data set for a pollutant is not sufficiently large to determine a CV directly. The permit limit equations are as follows:

$$MAL_{FF} = LTA_{FF}$$

$$DML_{FF} = LTA_{FF} \times \exp \left( \frac{2.326 \sqrt{\ln (1 + CV^2)} - 0.5 \ln (1 + CV^2)}{1.645 \sqrt{\ln \left( 1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left( 1 + \frac{CV^2}{N_m} \right)} \right)$$

Human health/fish flesh-based permit limitations for Outfall 001 are shown in the following table.

No permit limitations are required due to human health/fish flesh criteria.

**(3) Protection of Raw Water Column and Human Health for Consumption of Fish Flesh and Water – Public and Private Water Supply Use**

Both raw water column- and human health/fish flesh and water-based monthly average limits ( $MAL_{Raw}$  and  $MAL_{FFW}$ ) are equal to their respective criterion long term averages. Similarly, both raw water column- and human health/fish flesh and water-based daily maximum limits ( $DML_{Raw}$  and  $DML_{FFW}$ ) are calculated on a 99% probability basis. In accordance with OAC 252:690-3-89, a monitoring frequency ( $N_m$ ) of 2/month is utilized, and a CV of 0.6 is assumed where the effluent

data set for a pollutant is not sufficiently large to determine a CV directly. The permit limit equations are as follows:

$$MAL_{Raw} = LTA_{Raw}$$

$$DML_{Raw} = LTA_{Raw} \times EXP \left( \frac{2.326 \sqrt{\ln(1+CV^2)} - 0.5 \ln(1+CV^2)}{1.645 \sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5 \ln\left(1+\frac{CV^2}{N_m}\right)} \right)$$

$$MAL_{FFW} = LTA_{FFW}$$

$$DML_{FFW} = LTA_{FFW} \times EXP \left( \frac{2.326 \sqrt{\ln(1+CV^2)} - 0.5 \ln(1+CV^2)}{1.645 \sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5 \ln\left(1+\frac{CV^2}{N_m}\right)} \right)$$

Raw water column- and human health/fish flesh and water-based permit limitations for Outfall 001 are shown in the following table.

No permit limitations are required due to raw water column and human health/fish flesh and water criteria.

3. Mineral Constituent Criteria for Protection of the Agriculture Use

a. Criteria and Implementation

Yearly mean standard (YMS) and sample standard (SS) criteria for surface waters designated for the Agriculture use are specified at OAC 785:45-5-13 and Appendix F thereto, and are implemented according to procedures in OAC 785:46, Subchapter 9, OAC 252:690-3-79 through 3-85, and Chapter 3 of the CPP. OAC 785:46-9-2 requires that where segment-averaged YMS and SS values in OAC 785:45, Appendix F, are available and are adequate to represent the receiving stream in question, they be used as the criteria for protection of the Agriculture use. In the absence of site-specific YMS and SS criteria, a mineral constituent’s background concentration (Cb) is derived from the basin-wide YMS and SS criteria in OAC 785:45, Appendix F, as follows: Cb = 2 × CYMS – CSS. The results are shown in the table below.

Background, YMS Criterion and SS Criterion  
(concentration expressed in mg/L)

Outfall	Pollutant	Cb	YMS	SS
001 <sup>a</sup>	Chloride	248	398	548
	Sulfate	74	104	134
	Total Dissolved Solids (TDS)	454	726	998

<sup>a</sup> Criteria and background based on data for USGS monitoring station no. 07194500.



## b. Determination of Reasonable Potential and Wasteload Allocation

### (1) Reasonable Potential and WLA Equations

OAC 785:46-9-5 defines the reasonable potential equation for a pollutant's instream concentration  $C_d$  after complete mixing as follows:

$$C_d = \frac{(C_{95} Q^* + C_b)}{(1 + Q^*)}$$

YMS and SS wasteload allocations are calculated in accordance with OAC 252:690-3-83, as follows:

$$WLA_{YMS} = C_{YMS} + \frac{(C_{YMS} - C_b)}{Q^*}$$

$$WLA_{SS} = C_{SS} + \frac{(C_{SS} - C_b)}{Q^*}$$

### (2) Results of Reasonable Potential Screening

Results of the YMS and SS screens for Outfall 001, using  $Q_{e(30)}$  and  $Q_{e(LTA)}$  values in Section III.B.1,  $Q_{u(LTA)}$  and  $Q_{u(STA)}$  values in Section V.C.2.a,  $C_{95}$  values in Section V.C.2.c, and background levels and YMS and SS criteria reflected in Section V.D.3.a, are shown in the following tables. Any required OWQS WLAs are also shown. Where water quality-based permit limitations are required, results are shown in **bold face**.

**Results of YMS and SS Reasonable Potential Screens**  
(concentrations in mg/L unless otherwise specified)

Pollutant	Yearly Mean Std				Sample Std			
	$C_d$	$C_{YMS}$	$C_d > C_{YMS}?$	$WLA_{YMS}$	$C_d$	$C_{SS}$	$C_d > C_{SS}?$	$WLA_{SS}$
Chloride	248.0	398	No	N/A	248	548	No	N/A
Sulfate	74.0	104	No	N/A	74	134	No	N/A
TDS	454	726	No	N/A	454.1	998	No	N/A

## c. Permit Limitations

Since the discharge through Outfall 001 did not demonstrate RP to exceed either YMS or SS criteria, no water quality-based limitations are required to protect the Agriculture use.

## 4. Protection of the Primary Body Contact Recreation Uses and the Public and Private Water Supply Use

As described in Section V.B, the Primary Body Contact Recreation (PBCR) uses apply to the Arkansas River at Outfall 001.

OAC 785:45-5-16(a) states “The discharge shall not contain chemical, physical, or biological substances in concentrations that are irritating to skin or sense organs or are toxic or cause illness upon ingestion by human beings.” The draft permit will contain a narrative stating the prohibition of these conditions for Outfall 001.

**a. E. Coli – Primary Body Contact Recreation**

Per information provided in the permit application (Form 2C), the wastewater discharges at Outfall 001 do not include sanitary wastewater. Therefore, it is BPJ of the permit writer that a limitation for bacteria (coliform bacteria, *Escherichia coli*, and *Enterocci*) is not required for the discharges from these outfalls.

**b. Total Coliform – Public and Private Water Supply Use**

In accordance with OAC 252:690-3-78, total coliform criteria for protection of the PPWS use are applied where a discharge is within five miles upstream of a public water supply intake or within five miles of such an intake in a lake.

Since this receiving stream is not listed as a Public and Private Water Supply no permitting action is necessary to protect this use.

**5. Criteria for Protection of the Aesthetics Use**

**a. General**

Nutrient loading in Oklahoma’s surface waters, particularly of phosphorus, has become an area of concern. OAC 785:45-5-9(d) states, “Nutrients from point source discharges or other sources shall not cause excessive growth of periphyton, phytoplankton, or aquatic macrophyte communities which impairs any existing or designated beneficial use.” This narrative criteria is echoed in the State’s general antidegradation policy as applied to beneficial uses (OAC 785:45-3-2(d)), “No water quality degradation which will interfere with the attainment or maintenance of an existing or designated beneficial use shall be allowed.”

**b. Nutrient Limitations and Monitoring Requirements**

The previous permit for this facility contained no nitrate or phosphorus limits or reporting requirements. The application indicated that neither nitrate or phosphorus is expected to be present in the discharge from Outfall 001. It is the BPJ of the permit writer that effluent monitoring of nutrients is not warranted at this facility. The draft permit will, however, contain a narrative condition for control of solids to protect the Aesthetics use.

**E. MONITORING REQUIREMENTS**

**1. Effluent Monitoring Requirements**

**a. General**

In accordance with OAC 252:690-3-90, where reasonable potential to exceed an applicable criterion is not exhibited and there are fewer than 10 effluent data points to characterize the effluent, further effluent monitoring may be warranted based on use of the TSD method for computing  $C_{95(M)}$  (see Section V.C.2.c). The TSD procedure accounts for the inherent uncertainty in characterizing an effluent distribution from a small data set.



**b. Applicability**

Water quality-based limitations are required for the following pollutants:

- For Outfall 001: None

Effluent data sets comprised of 10 or more data points exist for the following pollutants:

- For Outfall 001: None

All other pollutants detectable in the discharge which have state water quality criteria are screened for reasonable potential using  $C_{95(M)}$  in place of  $C_{95}$  to determine which of them may require additional effluent monitoring. The same reasonable potential equations as described in sections V.D.2 and V.D.3 are used.

**c. Results of Reasonable Potential Screening Using  $C_{95(M)}$**

Where  $C_d$ , calculated using  $C_{95(M)}$  in place of  $C_{95}$ , exceeds an applicable criterion for a pollutant, a short term effluent monitoring requirement (sufficient to collect a minimum of ten data points) is established in the permit for that pollutant in accordance with OAC 252:690-3-90. Reasonable potential may then be reassessed with the larger effluent data set and the permit reopened, if necessary, to add appropriate effluent limitations. Results of the reasonable potential screens using  $C_{95(M)}$  are shown in the following tables. Where additional effluent monitoring is required, results are shown in **bold face**.

**(1) Aquatic Toxicity Criteria**

**Results of Acute and Chronic Toxicity RP Screens for Additional Effluent Monitoring using  $C_{95(M)}$**   
(concentrations in  $\mu\text{g/L}$  unless otherwise specified)

Effluent Characteristic	Acute Toxicity			Chronic Toxicity		
	$C_d$	$C_A$	$C_d > C_A?$	$C_d$	$C_C$	$C_d > C_C?$
Arsenic, total	0.80	340	No	0.07	150	No
Lead, total	0.00	194.05	No	0.00	7.56	No

**(2) Human Health/Fish Flesh Criteria**

**Results of OWQS Human Health/Fish Flesh RP Screens for Additional Effluent Monitoring Using  $C_{95(M)}$**   
(concentrations in  $\mu\text{g/L}$  unless otherwise specified)

Effluent Characteristic	$C_d$	$C_{FF}$	$C_d > C_{FF}?$
Arsenic, total	0.01	205	No
Lead, total	0.00	25	No

**(3) Raw Water Column and Human Health/Fish Flesh and Water Criteria**

No monitoring is required due to these criteria.

#### (4) YMS and SS Agriculture Criteria

##### Results of Agriculture YMS and SS RP Screens for Additional Effluent Monitoring Using $C_{95(M)}$ (concentrations in mg/L unless otherwise specified)

Effluent Characteristic	YMS Criteria			SS Criteria		
	$C_d$	$C_{YMS}$	$C_d > C_{YMS}?$	$C_d$	$C_{SS}$	$C_d > C_{SS}?$
Chloride	248	398	No	248	548	No
Sulfate	74.1	104	No	74.1	134	No
Total Dissolved Solids	454	726	No	454	454.1	No

Based on the results of these reasonable potential screens using  $C_{95(M)}$ , the draft permit will contain one year effluent monitoring requirements for the following pollutants:

For Outfall 001: None

## 2. Background Monitoring Requirements

OAC 252:690-3-10 requires that, where available, background levels be included in reasonable potential assessments and in calculating wasteload allocations.

### a. Determination of Background Monitoring Requirements for Aquatic Toxicity, Human Health and Raw Water Column Criteria

Background levels are known for the following pollutants:

- For Outfall 001: None

#### (1) Zero Background-Based Effluent Limits Required

Where zero background/water quality-based limits are established in a permit (derived from aquatic toxicity, human health and raw water column criteria only) for a pollutant based on an assumed zero background (or a partial background data set consisting of less than 10 data points), background monitoring for that pollutant is required. There are, however, two exceptions to this requirement, both of which exclude background concentration as a component in the wasteload allocation equation. These exceptions are as follows:

- where permit limits are based on a chronic toxicity criterion in an effluent-dominated discharge situation (i.e., where  $Q^* > 0.3333$ ), and
- where permit limits are based on a human health criterion (either fish flesh or fish flesh and water) and the associated wasteload allocation was set equal to that criterion because the discharge is in close proximity to a PWS intake.

No background monitoring is required.

#### (2) Sensitive BT/C (Background Trigger to Criterion) Ratio

Where permit limits for a pollutant are not required and the background is unknown (i.e., assumed zero), background monitoring may be justified for the purpose of reassessing whether there is reasonable potential to exceed an applicable criterion. In such cases, OAC 252:690-3-12 requires



that a background trigger to criterion (BT/C) ratio be used to determine whether background monitoring is warranted for a pollutant. Effluent monitoring for the pollutant may or may not also be required. The trigger background concentration for a given pollutant and water quality criterion is defined in OAC 252:690-1-2 as “the background concentration necessary to trigger reasonable potential for a substance to exceed an applicable criterion given a specified mean effluent concentration.” As described in Appendix J of OAC 252:690, the procedure involves calculating a BT/C ratio for each applicable criterion and comparing each such ratio with an associated threshold value,  $(BT/C)_{\max}$ , which is a function of the magnitude of each criterion. Where the value of the BT/C ratio exceeds 1.0, the  $C_{95}$  concentration is less than the criterion and there is no possibility of the pollutant exhibiting reasonable potential to exceed that criterion at any background level less than or equal to the criterion. Where the BT/C ratio  $\leq 1.0$ , the value of the  $C_{95}$  concentration is at least as great as the criterion and, depending on the magnitude of the criterion, background monitoring may be justified. If the BT/C ratio  $\leq (BT/C)_{\max}$  for any of the applicable criteria for a pollutant, then background monitoring for that pollutant is required. In order for  $(BT/C)_{\max}$  to be appropriately more sensitive to criteria of smaller magnitude, at which a measurable background level of a pollutant may have a relatively greater impact in the determination of reasonable potential, the value of the  $(BT/C)_{\max}$  threshold value function increases as the magnitude of a criterion decreases within the range of 1 to 1000  $\mu\text{g/L}$ .

**(a) Calculation of  $(BT/C)_{\max}$**

The value of  $(BT/C)_{\max}$  for each applicable criterion is an inverse function of the criterion’s magnitude with two break points (or “hinges”), one at 1  $\mu\text{g/L}$  and the other at 1000  $\mu\text{g/L}$ . It is calculated as follows:

$$(BT/C)_{\max} = 1.0, \text{ where the criterion} \leq 1.0 \mu\text{g/L}.$$

$$(BT/C)_{\max} = \frac{1}{2^{\log(\text{criterion})}}, \text{ where the criterion} > 1.0 \mu\text{g/L} \text{ and} \leq 1000 \mu\text{g/L}.$$

$$(BT/C)_{\max} = 0.125, \text{ where the criterion} > 1000 \mu\text{g/L}.$$

**(b) Calculation of BT/C Ratios**

Background trigger concentrations are first calculated for all applicable criteria and the BT/C concentration is then calculated by dividing the criterion-specific background trigger concentration by the applicable criterion. Values of  $Q_{e(30)}$ ,  $Q^*$ ,  $C_{95}$ ,  $C_A$ ,  $C_C$ ,  $C_{FF}$ ,  $C_{FFW}$ , and  $C_{Raw}$  are as previously defined.

**(i) Acute Toxicity Criteria**

$$BT/C_{\text{Acute}} = \frac{\left( \frac{64.63 C_A - Q_{e(30)} C_{95}}{64.63 - Q_{e(30)}} \right)}{C_A}, \text{ where } Q_{e(30)} < 64.63 \text{ MGD}.$$

$BT/C_{\text{Acute}}$  is not defined for values of  $Q_{e(30)} \geq 64.63 \text{ MGD}$ .

**(ii) Chronic Toxicity Criteria**

For discharges to streams, the following equations are used for values of  $Q^* < 0.3333$ :

$$BT/C_{\text{Chronic}} = \frac{\left( (1 + Q^*)C_C - 1.94 Q^* C_{95} \right)}{C_C}, \text{ where } Q^* \leq 0.1823$$

$$BT/C_{\text{Chronic}} = \frac{\left( (6.17 - 15.51 Q^*)C_C - C_{95} \right)}{C_C}, \text{ where } 0.1823 < Q^* < 0.3333$$

$BT/C_{\text{Chronic}}$  is not defined for  $Q^* \geq 0.3333$  (i.e., for effluent-dominated discharge situations), since  $C_b$  drops out as a component of the chronic toxicity reasonable potential equation at that point.

**(iii) Human Health/Fish Flesh Criteria**

$$BT/C_{\text{FF}} = \frac{(1 + Q^*)C_{\text{FF}} - Q^* C_{95}}{C_{\text{FF}}}$$

**(iv) Raw Water Column Criteria**

$$BT/C_{\text{Raw}} = \frac{(1 + Q^*)C_{\text{Raw}} - Q^* C_{95}}{C_{\text{Raw}}}$$

**(v) Human Health/Fish Flesh and Water Criteria**

$$BT/C_{\text{FFW}} = \frac{(1 + Q^*)C_{\text{FFW}} - Q^* C_{95}}{C_{\text{FFW}}}$$



**(3) Summary of Background Monitoring Requirements**

**Summary of Background Monitoring Requirements**

Effluent Characteristic	Effluent limit required?	Backgrd assumed zero? <sup>a</sup>	BT/C ratio procedure applicable?	BT/C Ratio Assessment				Backgrd monitoring required?
				Type Criterion <sup>b</sup>	BT/C Ratio <sup>c</sup>	(BT/C) <sub>max</sub>	BT/C ratio ≤ (BT/C) <sub>max</sub> ?	
Arsenic, total	No	Yes	Yes	Acute	> 1	0.173	No	No
				Chronic	1.000	0.221	No	
				FF	> 1	0.201	No	
Lead, total	No	Yes	Yes	Acute	> 1	0.205	No	No
				Chronic	>1	0.544	No	
				FF	> 1	0.379	No	

<sup>a</sup> In accordance with OAC 252:690-3-11(d), if only a partial background data set is available (less than 10 data points), it is considered the same as “background assumed zero” for purposes of calculating permit limits and determining whether additional background monitoring may be required.

<sup>b</sup> BT/C ratios for aquatic toxicity criteria are based on discharge directly to Arkansas River.

<sup>c</sup> BT/C ratios ≤ 1 are shown rounded to 3 decimal places.

**b. Agriculture Criteria**

For chloride, sulfate and TDS, where site-specific background data is not available, the background concentration is calculated from historical YMS and SS data in Appendix F of OAC 785:45 (see Section V.D.3). Thus, use of the BT/C ratio is not appropriate for determining whether background monitoring of these three mineral constituents is warranted.

**F. 303(d) LIST**

**1. Water Quality Assessment and Causes of Impairment**

The 2018 edition of the state’s 303(d) list indicates the following:

**a. Outfall 001**

The segment of the Arkansas River to which Outfall 001 discharges (WBID 120400010260\_00) is listed as impaired. The listed cause is Enterococcus.

**2. 303(d) List-Related Permitting Actions**

**a. Permitting Actions**

Where causes of impairment are listed generically, i.e., as a class of pollutants rather than as a specific pollutant or pollutants, EPA Region 6 policy requires that the draft permit include monitoring and reporting requirements for constituent pollutants in each listed class of pollutants as well as a reopener clause to incorporate the results of the approved TMDL as permit conditions. The data collected as a result of this requirement would then be used to support TMDL development. The facility does not discharge sanitary wastewater via Outfall 001, and therefore no 303(d) list-related permitting actions are necessary.

**b. Reopener clause**

A reopener clause is provided in the permit for the purpose of incorporating provisions of the TMDL after it is completed and approved.

**3. Total Maximum Daily Load (TMDL)**

A TMDL has been completed for this segment of the Arkansas River (WBID 120400010260\_00). The facility does not discharge sanitary wastewater via Outfall 001. Thus, the TMDL approved and established wasteload allocations for Enterococcus for this facility's discharge from Outfall 001 will not be incorporated into the water-quality based limits in the draft permit.

**G. ANTIDEGRADATION REQUIREMENTS**

As stated in Section V.B, no antidegradation restrictions apply to the segments of Arkansas River. Implementation of the state's antidegradation policy, as described at OAC 785:46, Subchapter 13, requires no further protection beyond the Tier 1 level (maintenance and protection of designated uses) for these receiving waters.

**H. PROTECTION OF ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT**

The segment of Arkansas River to which the Fansteel Metals facility discharges is not considered by the U.S. Fish and Wildlife Service (USFWS) to be a sensitive area for endangered or threatened species. Therefore, DEQ has concluded that notification of USFWS is not required, other than through the standard public notice process.

**I. 316(B) COOLING WATER INTAKE REQUIREMENTS**

This facility does not own or operate a cooling water intake structure. Thus, the requirements of Section 316(b) of the CWA do not apply to this facility.



## VI. NON-DISCHARGE REQUIREMENTS

### A. SURFACE IMPOUNDMENTS

#### Description of Wastewater Treatment/Disposal Surface Impoundments (S.I.s)

Classification <sup>b</sup> OAC 252:616-1-2		Liner Type	Holding Capacity <sup>a</sup> or Dimensions OAC 252:616-7-1(6)	WASTEWATER Destination
S.I. <sup>a</sup>	Wastewater			
F01 (P6)	Treated effluent, groundwater and stormwater from F02 Class II	Compacted clay	~ 1,010,000 gallons 100' x 200' x 9'	Outfall 001
F02 (P7)	Treated effluent, groundwater and stormwater from F03 and F04 Class II	Compacted clay	~ 1,610,000 gallons 150' x 350' x 7'	F01
F03 (P8)	Treated effluent, groundwater and stormwater Class II	30 mil HDPE	~ 17,200,000 gallons 350' x 350' x 25'	F02 or F04
F04 (P9)	Treated effluent, groundwater and stormwater Class II	30 mil HDPE	~ 17,200,000 gallons 250' x 600' x 20'	F01 or F02

<sup>a</sup> Based on information contained in the application

<sup>b</sup> Wastewater Classification according to OAC 252:616-1-2

#### Location of Surface Impoundments

S.I.	Legal Location	Relative Location of Impoundments
F01	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	Approximately 325 feet south of Chem "A" building
F02	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	South of facility and east of F03
F03	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	South of facility and west of F01, F02 and North of F04
F04	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee, Oklahoma	South of facility and south of F03

### SURFACE IMPOUNDMENT REQUIREMENTS

#### 1. Maintenance and Operation Plan (MOP) (OAC 252:616-5-2)

For tanks and surface impoundments that contain Class I and Class II wastewater, there must be a written Maintenance and Operation Plan (MOP). A MOP may be required for other wastewater classifications based on site specific information. The MOP must be followed, updated annually, if necessary, kept on-site and be available to DEQ.

#### 2. Freeboard Requirements (OAC 252:616-7-1(7))

A minimum freeboard of two (2) feet shall be maintained for surface impoundments F01, F02, F03 and F04.

### **3. Wastewater Classification [OAC 252:616-1-2]**

The wastewater generated from the treatment of contaminated groundwater at this facility is classified as Class II wastewater in accordance with OAC 252:616-1-2(B).

### **4. Depth to Groundwater (OAC 252:616-7-1(4))**

According to the application, depth to groundwater is approximately 19.4 feet below the bottom of the surface impoundments. For surface impoundments F03 and F04 this was achieved by building up the area with additional soil prior to building the surface impoundments. Therefore, the fifteen (15) foot minimum depth to groundwater has been met in accordance with OAC 252:616-7-1(4)(b).

### **5. Liner Requirements [OAC 252:616-7-2(b)]**

Surface impoundments F01 and F02 have compacted clay liners. This type of liner is appropriate and compatible for Class II wastewater in accordance with OAC 252:616-7-3. Surface impoundments F03 and F04 have 30 mil HDPE liners. This type of liner is appropriate and compatible for Class II wastewater in accordance with OAC 252:616-7-4.

### **6. Additional Requirements**

- The permit may be reopened to implement and/or require impoundment modifications, additions, extensions, and/or operational changes; monitoring and reporting; reclassification of wastes; sludge management plans; best management practices; closure plans; and/or other appropriate actions.
- At such time as surface impoundments F01, F02, F03, and F04 are to be permanently taken out of service or at such time as the contents of F01, F02, F03, and F04 pose a risk to the environment or waters of the State, the owner or operator of the facility shall follow all closure requirements contained in OAC 252:616-13.
- In all other respects, Surface Impoundments F01, F02, F03, and F04 shall be subject to standard conditions for surface impoundments contained in OAC 252:616, Subchapters 5, 7, and 13, including but not limited to requirements for construction, operation, maintenance, monitoring and closure.

## **A. GROUNDWATER PROTECTION REQUIREMENTS**

The Environmental Assessment (EA) completed by the NRC in December 1997 indicated that substantial contamination of the groundwater had occurred. At that time, the contamination appeared to be confined to the unconsolidated shallow aquifer underlying the Fansteel Metals property. Monitoring wells were drilled and these wells detected radioactivity, metals, ammonia, fluoride, and Methyl Isobutyl Ketone (MIBK) above the relevant EPA drinking water standards. The most significant levels of chemical contamination were detected in the monitoring wells near where inactive impoundments T01 and T02 were located. Elevated levels of gross alpha and gross beta radioactivity were also detected in the monitoring wells around the areas that impoundments F01, F02, F03, and F04 were located as well as where inactive impoundments T01 – T03 were located. It is generally believed that this is possibly due to the migration of radioactive constituents present in the residue in these ponds. The highest level of radioactivity was noted in the wells near where inactive impoundments T01 and T02 were located. This contamination is thought to be due to the fact that inactive impoundment T01 did not have a liner, although the environmental assessment indicated that there might have been a failure of the liner in impoundment T02.



Due to this, Fansteel Metals constructed an interceptor trench around the southern and eastern boundaries of the facility to collect contaminated groundwater. As specified previously, groundwater intercepted in this trench is routed to the treatment plant.

According to the NRC's 1997 EA, bedrock underlying the facility is overlain by alluvium deposited along the Arkansas River. The average thickness of the alluvial deposits is 42 feet. According to Table 1 of OAC 785:45, alluvium and terrace deposits of the Arkansas River has a vulnerability level characterized as "Very High".

Since groundwater monitoring has been active in the previous permits for this facility, this requirement will be carried on to this draft permit accordingly.

**a. Groundwater Monitoring Requirements**

Fansteel Metals has a series of 19 wells and four sumps used to monitor the groundwater at the facility. The locations of these wells and sumps are shown in the following table:

**Groundwater Monitoring Wells/Sumps at Fansteel Metals**

M.W. No.	Legal Location	General Location
MW-51	SW <sup>1</sup> / <sub>4</sub> , NE <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , Section 15, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 150' west of Sintering Building
MW-52	NW <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , Section 15, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 700' west of F03
MW-53	SE <sup>1</sup> / <sub>4</sub> , NE <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , Section 15, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 100' south of Service Building
MW-54	SE <sup>1</sup> / <sub>4</sub> , NE <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , Section 15, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 175' north of Service Building
MW-55	SW <sup>1</sup> / <sub>4</sub> , NW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 175' south of T03
MW-56	NE <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , SE <sup>1</sup> / <sub>4</sub> , Section 15, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 350' west of F03
MW-57	NE <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 75' east of F02 and 120' north of MW-59
MW-62	NE <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 50' east of T03 and 150' north of MW-57
MW-63	SW <sup>1</sup> / <sub>4</sub> , NW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 200' west of Chem "A" Building
MW-64	SW <sup>1</sup> / <sub>4</sub> , NW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 25' north of Chem "A" Building
MW-65	SE <sup>1</sup> / <sub>4</sub> , NW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 50' east of Chem "A" Building
MW-67	SE <sup>1</sup> / <sub>4</sub> , NW <sup>1</sup> / <sub>4</sub> , SW <sup>1</sup> / <sub>4</sub> , Section 16, Township 15N, Range 19EIM,	Approximately 250'



	Muskogee County, Oklahoma	east of Chem “A” Building
MW-68	NW¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 150’ west of T02
MW-69	NW¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 275’ north of T02
MW-70	NW¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 40’ west of Chem “C” Building
MW-71	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 90’ east of T02
MW-72	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 100’ northeast of T02
MW-74	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 180’ east of T02 and 175’ northeast of MW-71
MW-75	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 300’ northeast of T02 and 265’ east of MW-69
Sump 1	NE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 325’ north of northeast corner of T02
Sump 2	SE¼, NW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 300’ east of Chem “A” Building
Sump 3	NE¼, SW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 100’ east of northeast corner of F04
Sump 4	NW¼, SW¼, SW¼, Section 16, Township 15N, Range 19EIM, Muskogee County, Oklahoma	Approximately 100’ south of southwest corner of F04

A review of the groundwater monitoring data over the period of record (January 2015 to December 2019) confirms that the shallow groundwater at the facility location still contains pollutants discussed in the EA done by the NRC in 1997. Although these pollutants are still present, the concentrations in some monitoring wells are considerably lower than originally detected. The metal concentrations in most of wells and sumps measure as low as 0.001 mg/L and with concentration trends ranging from spiky to steady decrease. The groundwater data and corresponding graphs can be found in edoctus, under system ID 2328789 or by a formal written request to the DEQ.

According to the preliminary reassessment report of June 12, 2018, by the Land Protection Division (LPD)-DEQ, radiological and non-radiological contamination remains in the soil and groundwater at this facility due to its previous industrial processes. Fansteel Metals commenced with phase 1 of the four (4) phase decommissioning plan (DP) work in 2005 but has yet to complete the phase. The data collected from all active monitoring wells installed onsite is solely for informational purposes. As such, no rigorous remedial actions have been conducted.

Although progress is shown in the data, the groundwater is still contaminated and remedial actions will have to be taken in order to clean up the groundwater. Assessment of non-radiological contaminants has been limited, and additional characterization is required to further assess and delineate the extent of groundwater contamination. The groundwater collected in the four (4) sumps is treated with lime to precipitate out the fluorides, metals and radioactive particles (gross alpha and gross beta) prior to discharge via Outfall 001. According to the recent groundwater monitoring data, the average alpha and beta radiations in most wells was greater than 15 pCi/L, which is the primary drinking water standard for this parameter. Monitoring for radiological parameters (gross alpha and



gross beta radiations) was required in the previous permit; therefore, the new permit will also include a requirement for monitoring of gross alpha and gross beta radiations in all monitoring wells and sumps.

The previous permit for the facility required semi-annual (twice/year) groundwater monitoring for the life of the permit. Since the groundwater monitoring wells are used solely for informational purposes; therefore, the new permit will have a once every other year (1/2-years) groundwater monitoring requirement for all nineteen (19) active groundwater monitoring wells for the life the permit. However, the four (4) sumps (Sump 1, Sump 2, Sump 3, and Sump 4) will maintain the semi-annual (twice/year) groundwater monitoring requirements for the life of the permit. The depth to groundwater will be monitored in the wells during all sampling events. Additionally, Fansteel Metals will notify the DEQ, should the WIP project and/or any other remedial activities recommence. At that time, DEQ will reevaluate and revise the groundwater monitoring requirements accordingly.

The groundwater monitoring requirements for each well are summarized in the following table:

Well #	Depth to Ground-water	pH	Arsenic	Cadmium	Chromium	Lead	Ammonia	Fluoride	MIBK	TDS	Alpha/Beta Radiation
MW-51	X	X					X	X		X	X
MW-52	X	X					X	X		X	X
MW-53	X	X					X	X		X	X
MW-54	X	X					X	X		X	X
MW-55	X	X	X	X	X	X	X	X		X	X
MW-56	X	X					X	X		X	X
MW-57	X	X	X				X	X		X	X
Sump 3	X	X	X	X	X	X	X	X	X	X	X
Sump 4	X	X	X	X	X	X	X	X	X	X	X
MW-62	X	X	X				X	X		X	X
MW-63	X	X	X				X	X		X	X
MW-64	X	X	X	X	X	X	X	X	X	X	X
MW-65	X	X	X	X	X	X	X	X		X	X
Sump 1	X	X	X	X	X	X	X	X	X	X	X
Sump 2	X	X	X	X	X	X	X	X	X	X	X
MW-67	X	X	X	X	X	X	X	X	X	X	X
MW-68	X	X	X	X	X	X	X	X		X	X
MW-69	X	X	X	X	X	X	X	X		X	X
MW-70	X	X	X	X	X	X	X	X		X	X
MW-71	X	X	X	X	X	X	X	X	X	X	X
MW-72	X	X	X	X	X	X	X	X	X	X	X
MW-74	X	X	X	X	X	X	X	X	X	X	X
MW-75	X	X					X	X		X	X

## B. LAND APPLICATION

The facility does not use land application.

## C. SEPTIC TANK SYSTEM

Not applicable as stated in the permit application.

VII. DRAFT PERMIT EFFLUENT LIMITATIONS

A. GENERAL

In accordance with 40 CFR 122.44(a), (d) and (l), pollutant limitations and monitoring requirements are established in the draft permit based on the more stringent of technology-based, water quality-based or previous permit requirements. Both concentration and mass (loading) limits are established unless it is impractical to specify loading limits because of the units in which concentration limits are expressed (e.g., standard units for pH or degrees for temperature). Such loading limitations are calculated for each affected outfall using that outfall’s high 30-day average effluent flow,  $Q_{e(30)}$ , over the period of record (see Section III.B.1) according to the following equation:

Mass loading limit (*lb/day*) = Concentration limit (*mg/L*)  $\times$   $Q_{e(30)}$  (*MGD*)  $\times$  8.34

B. OUTFALL 001

The following are effluent limitations and monitoring requirements for Outfall 001.

1. Limited Parameters

Mass Loading Limitations and Reporting Requirements (Outfall 001)

Effluent Characteristic <sup>a</sup>	Water Quality Stds Basis		Previous Permit Basis		Draft Permit <sup>b</sup>	
	Daily Avg	Daily Max	Daily Avg	Daily Max	Daily Avg	Daily Max
Flow (MGD)	--	--	Report	Report	Report	Report
Ammonia (as N)	--	--	110	193	98	172
Arsenic, total	--	--	N/A	N/A	N/A	N/A
Niobium, total	--	--	0.23	0.36	0.21	0.32
Flouride, total	--	--	33	36	29	32
Lead, total	--	--	0.16	0.27	0.14	0.24
Nitrate-Nitrite (as N)	--	--	30	42	27	37

<sup>a</sup> Units are lb/day, unless otherwise specified.  
<sup>b</sup> Loadings based on  $Q_{e(30)}$  of 0.318 MGD



### Concentration Limitations and Reporting Requirements (Outfall 001)

Effluent Characteristic <sup>a</sup>	Water Quality Stds Basis		Previous Permit Basis		Draft Permit <sup>c</sup>	
	Daily Avg	Daily Max	Daily Avg	Daily Max	Daily Avg	Daily Max
Flow (MGD)	--	--	--	--	--	--
Ammonia (as N)	--	--	37	65	37	65
Arsenic, total	--	--	Report	Report	Report	Report
Niobium, total <sup>b</sup>	--	--	0.078	0.12	0.078	0.12
Flouride, total	--	--	11	12	11	12
Lead, total	--	--	0.054	0.090	0.054	0.090
Nitrate-Nitrogen (as N)	--	--	10	14	10	14
Total Dissolved Solids	--	--	Report	Report	Report	Report
pH	6.5 s.u to 9.0 s.u.		6.5 s.u to 9.0 s.u.		6.5 s.u to 9.0 s.u.	

<sup>a</sup> Units are mg/L, unless otherwise specified.

<sup>b</sup> Formerly Columbium

<sup>c</sup> There are no technology-based limitations for this type of industrial process. See Section IV.B.

## 2. Monitoring Frequencies and Sample Types

### a. Evaluation for Performance-Based Monitoring Frequency Reductions

Performance-based monitoring frequency reductions are considered in accordance with OAC 252:690-3-91 and Chapter 3 of the CPP. Where Significant Noncompliance (SNC) with permit limitations has been exhibited during the period of record, the facility is ineligible for any performance-based monitoring frequency reduction for the affected pollutant. Results of the evaluation are as follows.

Effluent Characteristic	Previous Permit		Performance				Eligible for Monitoring Frequency Reduction?
	Monitoring Freq	Monthly Avg Conc Limit	Long Term Avg	Ratio of LTA Performance to Limit (percent)	Any pmt limit violations?	Signif Non-compliance (SNC)?	
Ammonia (as N)	1/month	37	1.19	3.2	No	--	No
Niobium, total	1/month	0.078	0.022	28	No	--	No
Fluoride, total	1/week	11	6.05	55	No	--	No
Lead, total	2/month	0.054	0.005	9.2	No	--	Yes (to 1/month)
Nitrate Nitrogen (as N)	1/month	10	1.02	10	No	--	No

### b. Monitoring Requirements and Sample Types

Based on monitoring requirements in OAC 252:690-3-90 through 3-91, and incorporating the results of the evaluation for performance-based monitoring frequency reductions in Section VII.B.2.a, monitoring requirements for Outfall 001 beginning at the effective date of the permit are as follows.

### Monitoring Requirements and Sample Types – Outfall 001

Effluent Characteristic	Previous OPDES Permit		Draft Permit	
	Msmt Frequency	Sample Type	Msmt Frequency <sup>a</sup>	Sample Type
Flow (MGD)	Continuous	Record	Continuous	Record
Ammonia (as N)	1/month	24-hr comp	1/month	24-hr comp
Arsenic, total	1/month	24-hr comp	1/month	24-hr comp
Niobium, total	1/month	24-hr comp	1/month	24-hr comp
Fluoride, total	1/week	24-hr comp	1/week	24-hr comp
Lead, total	2/month	24-hr comp	1/month	24-hr comp
Nitrate Nitrogen (as N)	1/month	24-hr comp	1/month	24-hr comp
Total Dissolved Solids (TDS)	1/quarter	24-hr comp	1/quarter	24-hr comp
pH	3/week	Grab	3/week	grab

<sup>a</sup> See discussion of performance-based monitoring frequency reductions.

#### D. BACKGROUND MONITORING (MONITORING POINT 999)

Background levels of the following pollutants in Arkansas River will be monitored and reported as follows:

None

#### E. COMPLIANCE SCHEDULE

The permittee shall achieve compliance with the specified final effluent limitations in accordance with the following schedule: None

### VIII. SUMMARY OF CHANGES FROM PREVIOUS PERMIT

The following changes were made in the draft permit relative to the previous OPDES permit.

- Groundwater monitoring frequency for all active wells reduced to once every other year (1/2-years).
- WET Testing requirements removed.
- Effluent monitoring frequency for lead reduced to once per month.

### IX. ADMINISTRATIVE RECORD

The following sources were used to prepare the draft permit and constitute a part of its administrative record.

#### A. APPLICATIONS

OPDES Permit Application No. OK0001643 (Form 1, Form 616-2SI, Form 2C), received 01/02/2020.

#### B. CLEAN WATER ACT CITATIONS

Sections 301, 303(d), 305(b), 402(a) and 402(o).

#### C. 40 CFR CITATIONS

40 CFR Parts 122, 124 and 136.



#### **D. STATE LAW, STANDARDS, AND RULES AND REGULATIONS**

- Oklahoma Pollutant Discharge Elimination System (OPDES) Act, 27A O.S. §2-6-201 *et seq.*
- OAC 252:606, Discharge Standards (DEQ).
- OAC 252:616, Surface Impoundment Standards (DEQ).
- OAC 252:690, Water Quality Standards Implementation (DEQ).
- OAC 785:45, Oklahoma Water Quality Standards (OWRB).
- OAC 785:46, OWQS Implementation (OWRB).
- Oklahoma Continuing Planning Process (CPP) Document (DEQ).

#### **E. MISCELLANEOUS**

- 2018 Integrated Report, Appendix C (303(d) List) and Appendix E (completed TMDL's).
- Permit file, OPDES Permit No. OK0001643, including selected biomonitoring laboratory reports and groundwater Self-Monitoring Reports (SMRs).
- Downham, T, Department of Environmental Quality. *Preliminary Reassessment, Fansteel Metals*. June 12, 2018.
- Integrated Compliance Information System (ICIS) data retrieval, December 2017 through November 2019.
- EPA Region 6 revision to Post Third Round Biomonitoring Policy, dated June 30, 2000.
- USGS publication, *Statistical Summaries of Streamflow in and near Oklahoma Through 2007*, U.S. Geological Survey Scientific Investigations Report 2009-5135, Lewis, J.M., and Esralew, R.A., 2009.

#### **X. REVIEW BY OTHER AGENCIES AND FINAL DETERMINATION**

A public notice which includes a link to the DEQ webpage where the draft permit may be viewed will be sent to various Federal and State agencies upon posting the draft permit on the DEQ webpage. If comments are received from these agencies or other State or Federal agencies with jurisdiction over fish, wildlife, or public health, the permit may be denied or additional conditions may be included in accordance with regulations promulgated at 40 CFR 124.59.

The public notice describes the procedures for the formulation of final determinations.