

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

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

Permit No. MO-0000281

Owner: The Doe Run Resources Corporation
dba The Doe Run Company

Address: 1801 Park 270, Suite 300, St. Louis, MO 63146

Continuing Authority: Same as above
Address: Same as above

Facility Name: The Doe Run Co. - Herculaneum Smelting Division
Facility Address: 881 Main Street, Herculaneum, MO 63048

Legal Description: See Page 2
UTM Coordinates: See Page 2

Receiving Stream: See Page 2
First Classified Stream and ID: See Page 2
USGS Basin & Sub-watershed No.:

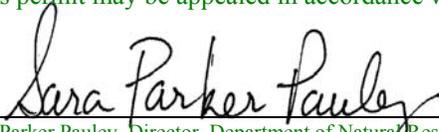
is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

SEE PAGE 2

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

February 25, 2011 March 20, 2012
Effective Date Revised Date


Sara Parker Pauley, Director, Department of Natural Resources

February 24, 2016
Expiration Date


John Madros, Director, Water Protection Program

FACILITY DESCRIPTION

Outfall #001 - Primary Lead Smelting; SIC #3339

Industrial process wastewater and process storm water is treated in a wastewater plant with a design capacity of 1.224 MGD. The treatment consists of the following unit processes:

1. Flocculation
2. Neutralization
3. Sedimentation
4. Sand/Anthracite Filtration
5. Clarification
6. Sludge thickening/dewatering

Legal Description: Land Grant 3028, Jefferson County

UTM Coordinates: X=729862, Y=4238134

Receiving Stream: Mississippi River (P)

First Classified Stream and ID: Mississippi River (01707)

USGS Basin & Sub-watershed No.: (07140101-0807)

Design capacity is 1.224 MGD.

Design flow is 0.850 MGD.

Actual flow is 0.548 MGD.

Outfall #002 - **ELIMINATED**, Outfall has been capped (see fact sheet)

Outfall #003 - Primary Lead Smelting- SIC #3339

Acid plant non-contact cooling water, no treatment/non-contact cooling water.

Legal Description: Land Grant 3028, Jefferson County

UTM Coordinates: X=729797, Y=4238167

Receiving Stream: Mississippi River (P)

First Classified Stream and ID: Mississippi River (01707)

USGS Basin & Sub-watershed No.: (07140101-0807)

Design flow is 2.33 MGD.

Actual flow is 1.72 MGD.

Outfall #004 - Storm water runoff from slag storage area- SIC # 3339

Legal Description: Land Grant 3028, Jefferson County

UTM Coordinates: X=729591, Y=4237479

Receiving Stream: Joachim Creek (P)

First Classified Stream and ID: Joachim Creek (01719)

USGS Basin & Sub-watershed No.: (07140101-0804)

Actual flow is rainfall dependant.

Outfall #005 – **ELIMINATED**, sampling no longer required.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

PAGE NUMBER 3 of 11

PERMIT NUMBER MO-0000281

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective upon issuance and remain in effect until 2 years and 364 days after the effective date of this permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
OUTFALL #001						
Flow	MGD	*		*	once/weekday****	24 hr. estimate
pH	SU	**		**	once/week	grab
Total Suspended Solids	lbs/day	379.3		206.5	once/week	grab
Arsenic, Total Recoverable	lbs/day	3.98		1.69	once/week	grab
Cadmium, Total Recoverable	lbs/day	1.964		0.785	once/week	grab
Copper, Total Recoverable	lbs/day	3.67		1.6	once/week	grab
Lead, Total Recoverable	lbs/day	3.03		1.26	once/week	grab
Zinc, Total Recoverable	lbs/day	11.04		3.73	once/week	grab
Hardness, Total as CaCO ₃	mg/L	*		*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE April 28, 2012.

Antimony, Total Recoverable	µg/L	*		*	once/quarter*****	grab
Phenols	mg/L	*		*	once/quarter	grab
Thallium, Total Recoverable	µg/L	*		*	once/quarter	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE July 28, 2012.

WHOLE EFFLUENT TOXICITY (WET) TEST	TU	3.30 TUa See Special Condition #11			twice/year in January & August	24 hr. composite
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MONITORING REPORTS SHALL BE SUBMITTED SEMI-ANNUALLY; THE FIRST REPORT IS DUE September 28, 2012.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED PART I STANDARD CONDITIONS DATED OCTOBER 1, 1980 AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 4 of 11	
PERMIT NUMBER MO-0000281						
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective 3 years from the effective date of this permit and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>OUTFALL #001</u>						
Flow	MGD	*		*	once/weekday****	24 hr. estimate
pH	SU	**		**	once/week	grab
Total Suspended Solids	lbs/day	379.3		206.5	once/week	grab
Arsenic, Total Recoverable	lbs/day	3.98		1.69	once/week	grab
Cadmium, Total Recoverable	lbs/day	1.22		0.61	once/week	grab
Copper, Total Recoverable	lbs/day	2.77		1.40	once/week	grab
Lead, Total Recoverable	lbs/day	3.03		1.26	once/week	grab
Zinc, Total Recoverable	lbs/day	11.04		3.73	once/week	grab
Hardness, Total as CaCO ₃	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2014</u> .						
Antimony, Total Recoverable	µg/L	*		*	once/quarter	grab
Phenols	mg/L	*		*	once/quarter	grab
Thallium, Total Recoverable	µg/L	*		*	once/quarter	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2014</u> .						
Whole Effluent Toxicity (WET) Test	TU	3.30 TUa See Special Condition #11			twice/year in January & August	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED <u>SEMI-ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>September 28, 2013</u> .						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>PART I</u> STANDARD CONDITIONS DATED <u>OCTOBER 1, 1980</u> AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER	5 of 11
					PERMIT NUMBER	MO-0000281
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>OUTFALL #003</u>						
Flow	MGD	*		*	once/weekday****	24 hr. estimate
Temperature	° C	*		*	once/weekday****	grab
pH	SU	***		***	once/week	grab
Oil and Grease	mg/L	15		10	once/week	grab
Arsenic, Total Recoverable	µg/L	*		*	once/week	grab
Cadmium, Total Recoverable	µg/L	*		*	once/week	grab
Copper, Total Recoverable	µg/L	*		*	once/week	grab
Lead, Total Recoverable	µg/L	*		*	once/week	grab
Zinc, Total Recoverable	µg/L	*		*	once/week	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2012</u> .						
<u>OUTFALL #004 (NOTE 1)</u>						
Flow	MGD	*		*	once/quarter*****	24 hr. estimate
Arsenic, Total Recoverable	µg/L	*		*	once/quarter	grab
Cadmium, Total Recoverable	µg/L	*		*	once/quarter	grab
Copper, Total Recoverable	µg/L	*		*	once/quarter	grab
Lead, Total Recoverable	µg/L	*		*	once/quarter	grab
Zinc, Total Recoverable	µg/L	*		*	once/quarter	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2012</u> .						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>PARTS I</u> STANDARD CONDITIONS DATED <u>OCTOBER 1, 1980</u> AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

Note 1 – Sampling at outfall 004 is not required when Mississippi River elevations cause Joachim Creek to back up into the outfall during the entire reporting period (quarter). Report on Discharge Monitoring Report why sampling was not conducted.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 7.5-10.0 pH units.
- *** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.
- **** Once each weekday means: Monday, Tuesday, Wednesday, Thursday, and Friday.
- ***** See table below for quarterly sampling:

Sample discharge at least once for the months of:	Report is due:
January, February, March (1st Quarter)	April 28
April, May, June (2nd Quarter)	July 28
July, August, September (3rd Quarter)	October 28
October, November, December (4th Quarter)	January 28

C. SPECIAL CONDITIONS

1. Any sludge removed shall be processed through the smelting process, or the MDNR shall be contacted for approval of the alternate disposal method.
2. A Quality Assurance/Quality Control (QA/QC) plan shall be maintained for samples analyzed by the permittee, and QA/QC plans submitted for any other laboratories which will be used to fulfill monitoring requirements.
3. This permit may be reopened and modified, or alternatively revoked and reissued, to:
 - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
 - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.
4. All outfalls must be clearly marked in the field.
5. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established in Part A of the permit by the Director.
 - (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.
 - (c) That the effluent limit established in part A of the permit will be exceeded.
6. Report as no-discharge when a discharge does not occur during the report period.

C. SPECIAL CONDITIONS (continued)

7. The permittee shall develop or modify and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must be modified to include any new permit requirements within 30 days and implemented within 90 days of permit issuance. The SWPPP must be kept on-site and should not be sent to DNR unless specifically requested. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in the following document:

Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in February 2009.

The SWPPP must include the following:

- (a) An assessment of all storm water discharges associated with this facility. This must include a list of potential contaminants, including those associated with any fuel storage facilities, and an annual estimate of amounts that will be used in the described activities.
 - (b) A listing of specific Best Management Practices (BMPs) and a narrative explaining how BMPs will be implemented to control and minimize the amount of potential contaminants that may enter storm water. Minimum BMPs are listed in SPECIAL CONDITIONS #9 below.
 - (c) The SWPPP must include a schedule for a quarterly site inspection and a brief written report. The inspections must include observation and evaluation of BMP effectiveness, deficiencies, and corrective measures that will be taken. Corrective action to address deficiencies must be initiated within seven days. Inspection reports must be kept on site with the SWPPP. These must be made available to DNR personnel upon request.
 - (d) A provision for designating an individual to be responsible for environmental matters. Permittee shall notify the department in writing of a personnel change for this position. One individual may be the contact for multiple facilities so long as that person can effectively communicate with the department on every facility.
 - (e) A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of DNR.
8. There are no longer regular sampling requirements in this permit for the former stormwater outfall 005. However, the department may require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or evidence of off site impacts from activities at the facility. If such an action is needed, the department will specify in writing the sampling requirements, including such information as location and extent. It is a violation of this permit to fail to comply with said written notification.

Storage of materials at the area which drained to outfall 005 is limited to fabricated metal, spare parts, and scrap metal. The permittee must seek approval before storing other materials in this location. Approval may be granted without a permit modification, if the permittee can demonstrate to the satisfaction of the department that water quality will be protected with existing permit requirements.

C. SPECIAL CONDITIONS (continued)

9. Permittee shall adhere to the following minimum Best Management Practices:
- (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of storm water from these substances.
 - (b) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
 - (c) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to storm water or provide other prescribed BMP's such as plastic lids and/or portable spill pans to prevent the commingling of storm water with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
 - (d) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
 - (e) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed, to comply with effluent limits.
10. Reporting of Effluent Violations
- (a) If any of the sampling results from any of the outfalls show any violation of the permit discharge limitations, written notification shall be made to the Department of Natural Resources within five (5) days of notification of analytical results.
 - (b) Notification shall indicate the date(s) of sample collection, the analytical results, and permit number, and shall include a statement concerning the revisions or modifications in management practices that are being implemented to address the violation of the limitations that occurred.

C. SPECIAL CONDITIONS (continued)

11. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT				
OUTFALL	Toxic Unit Limit	FREQUENCY	SAMPLE TYPE	MONTH
001	3.30 TUa	Semi-Annually	24 hr. composite	January and August

Dilution Series						
40%	30%	20%	10%	5%	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a MULTIPLE-dilution acute WET test in the months and at the frequency specified above. For tests which are successfully passed, submit test results using the Department's WET test report form #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
 - (a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
 - (b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
 - (c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.
 - (d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.
 - (e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
 - (f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
 - (h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
 - (i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
 - (j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
 - (k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
 - (l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.
- (2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (3) If the effluent fails the test, a multiple dilution test shall be performed for BOTH test species within 30 calendar days and biweekly thereafter (for storm water, tests shall be performed on the next and subsequent storm water discharges as they occur, but not less than 7 days apart) until one of the following conditions are met:
 - (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

C. SPECIAL CONDITIONS (continued)

11. Acute Whole Effluent Toxicity (continued)

- (4) Failure of a WET test is a violation of this permit.
- (5) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
- (6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
- (7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
- (8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
- (9) Submit a concise summary in tabular format of all WET test results with the annual report.

(b) PASS/FAIL procedure and effluent limitations:

- (1) To pass a multiple-dilution test:
 - (a) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC) OF 30% OR LESS, the AEC must be less than three-tenths (0.3) of the LC₅₀ concentration for the most sensitive of the test organisms; **OR**,
 - (b) For facilities with an AEC greater than 30%, the LC₅₀ concentration must be greater than 100%; **AND**,
 - (c) All effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required.

(c) Test Conditions

- (1) Test Type: Acute Static non-renewal
- (2) All tests, including repeat tests for previous failures, shall include both test species listed below.
- (3) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.
- (4) Test period: 48 hours at the "Allowable Effluent Concentration" (AEC) specified above.
- (5) Upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.
- (6) Unless otherwise specified above, multiple-dilution tests will be run with:
 - (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
 - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (c) Reconstituted water.
- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.
- (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

SUMMARY OF TEST METHODOLOGY FOR ACUTE WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

D. SCHEDULE OF COMPLIANCE

1. The permittee must attain compliance with the final effluent limits as soon as possible, but no later than three years after issuance of this permit.
2. Within one year of issuance of this permit, the permittee shall submit a report detailing progress made in attaining compliance with the final effluent limits.
3. Within two years of issuance of this permit, the permittee shall submit a report detailing progress made in attaining compliance with the final effluent limits.

Missouri Department of Natural Resources
FACT SHEET
FOR THE PURPOSE OF MODIFICATION OF
MO-000281
DOE RUN HERCULANEUM SMELTER

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

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for:

- Major
- Industrial Facility
- And/or permit with widespread public interest

Part I – Facility Information

Facility Type: IND
 Facility SIC Code(s): 3339

Facility Description:

The Doe Run Herculaneum Smelter is a primary lead smelter located in Herculaneum, MO. Outfall #001 has a design capacity of 1.224 MGD (1.897 cfs). The effluent from Outfall #001 is industrial process wastewater and process stormwater that undergoes flocculation, neutralization, clarification and filtration. Outfall #001 has interim limits to allow time for Doe Run to meet water quality based effluent limits (WQBELs) for Arsenic and Copper. TSS, Cadmium, Lead, and Zinc reductions are immediate as they are based on effluent guidelines (ELGs) in 40 CFR 421.72-73. Outfall #002 was an emergency stormwater outfall and has been capped. Outfall #003 discharges acid plant non-contact cooling water from the sulfuric plant. It has a design flow of 2.33 MGD (3.61 cfs). Outfall #004 consists of stormwater run-off from the slag pile area.

Due to the Administrative Order of Consent, work is ongoing to eliminate stormwater runoff from the slag pile area. Outfall 002 has been capped and is being removed from monitoring in this permit renewal because it has not discharged during the previous permit cycle. Effluent limits on Outfall #001 were completed using categorical allowances and then compared to the water quality based effluent limits, with more protective effluent limit used. 10 CSR 20-7 Table A changes become effective October 30, 2009, which effects the WQBEL calculations for Copper and Zinc. Monitoring for Antimony, Thallium, Phenol and Sulfate was added based on the expanded testing in 1999, 2001, and 2007. For Outfall #005, stormwater is managed in such a way that the stormwater monitoring requirement was removed. The area previously covered under Outfall #005 covers equipment storage. There is not a slag pile in the area that drains to this outfall.

Comments:

Changes to this permit include:

- Revision of mass based effluent limits for Cadmium and Copper to consider design flow of the facility. The previous permit considered 90th percentile flow during 2008 and 2009.
- Revision of facility inspections associated with the SWPPP to include once per quarter inspections.
- Removal of the 2.5% dilution series from the WET test.
- Removal of effluent limit for Silver. Facility data shows non detect results.

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	1.89	NEUTRALIZATION & FILTRATION	PROCESS WASTEWATER AND STORM WATER	0.0
002	NA		CAPPED	
003	3.61	NONE	ACID PLANT NON-CONTACT COOLING WATER	0.0
004	VARIES	SWPPP/ AOC	STORM WATER	0.0

See Appendix A for description of facility outfalls.

Part II – Operator Certification Requirements

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], permittees shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators or supervisors of operations at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation.



This facility is not required to have a certified operator.

Part III – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri’s Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall’s Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]
- Lake or Reservoir [10 CSR 20-7.015(3)]
- Losing [10 CSR 20-7.015(4)]
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]
- Special Stream [10 CSR 20-7.015(6)]
- Subsurface Water [10 CSR 20-7.015(7)]
- All Other Waters [10 CSR 20-7.015(8)]

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

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Mississippi River***	P	1707	AQL, DWS, IND, IRR, LWV, SCR	07140101	Ozark/Apple/ Joachim
Joachim Creek	P	1719	AQL, IND, LWV, SCR, WBC(A)		

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

** - Ecological Drainage Unit

*** - UAA conducted in July 2005 on the Mississippi River.

RECEIVING STREAM(S) LOW-FLOW AND MIXING ZONE VALUES TABLE:

RECEIVING STREAM	1Q10			7Q10			30Q10		
	FLOW (CFS)	MZ (CFS)	ZID (CFS)	FLOW (CFS)	MZ (CFS)	ZID (CFS)	FLOW (CFS)	MZ (CFS)	ZID (CFS)
MISSISSIPPI RIVER (P)*	49,700	12,425	18.97	61,700	15,425	18.97	53,633	13,408	18.97
JOACHIM CREEK (P)	0.1	0.025	0.0025	0.1	0.025	0.0025	1.0	0.25	0.025

*Low stream flow values were determined from United States Gaging Station # 07010000, located on the Mississippi River approximately 22 miles upstream from Doe Run Herculaneum Smelter from 1980-2009.

The Mississippi River is on the 303(d) list for impairment due to lead and zinc. Joachim Creek is listed in the 2008 305(B) Water Quality Report as potentially impaired for lead (Table 16). MDNR is in the process of completing a TMDL for the Mississippi River for the lead and zinc impairments.

- **OUTFALL #001,003–MISSISSIPPI RIVER**
Mixing Zone: Mixing zone ¼ of stream width, cross-sectional area or volume of flow. [10 CSR 20-7.031(4)(A)4.B.(III)(a)]
Zone of Initial Dilution: No more than ten times the effluent design volume. [10 CSR 20-7.031(4)(A)4.B.(III)(b)]
- **OUTFALL #004-JOACHIM CREEK**
Mixing Zone: Mixing zone ¼ of stream width, cross-sectional area or volume of flow. [10 CSR 20-7.031(4)(A)4.B.(III)(a)]
Zone of Initial Dilution: one-tenth(0.1) of the mixing zone width, cross sectional area or volume of flow [10 CSR 20-7.031(4)(A) 4.B.(III)(b)].

RECEIVING STREAM MONITORING REQUIREMENTS:

No receiving water monitoring requirements recommended at this time.

Part IV – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

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

Not Applicable

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

ANTI-BACKSLIDING:

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

Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.

ANTIDegradation:

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

Renewal no degradation proposed and no further review necessary.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:

As per [10 CSR 20-6.010(3)(B)], ...An applicant may utilize a lower preference continuing authority by submitting, as part of the application, a statement waiving preferential status from each existing higher preference authority, providing the waiver does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the department.

COMPLIANCE AND ENFORCEMENT:

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

Applicable

The permittee/facility is currently under an Administrative Order of Consent with USEPA and Missouri DNR concerning the clean-up of the slag pile area. The slag pile area are the source of stormwater run-off for Outfall #004.

PRETREATMENT PROGRAM:

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Not Applicable

The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any given pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

Not Applicable

A RPA was not conducted for this facility.

REMOVAL EFFICIENCY:

Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD₅) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals. Please see the United States Environmental Protection Agency's (EPA) website for interpretation of percent removal requirements for National Pollutant Discharge Elimination System Permit Application Requirements for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage @ www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm.

Not Applicable

Influent monitoring is not being required to determine percent removal.

SANITARY SEWER OVERFLOWS (SSOs), BYPASSES, INFLOW & INFILTRATION (I&I) – PREVENTION/REDUCTION:

Sanitary Sewer Systems (SSSs) are municipal wastewater collection system that convey domestic, commercial, and industrial wastewater, and limited amounts of infiltrated groundwater and storm water (i.e. I&I), to a POTW. SSSs are not designed to collect large amounts of storm water runoff from precipitation events.

Untreated or partially treated discharges from SSSs are commonly referred to as SSOs. SSOs have a variety of causes including blockages, line breaks, sewer defects that allow excess storm water and ground water to overload the system, lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. A SSO is defined as an untreated or partially treated sewage release from a SSS. SSOs can occur at any point in an SSS, during dry weather or wet weather. SSOs include overflows that reach waters of the state. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations. SSSs can back up into buildings, including private residences. When sewage backups are caused by problems in the publicly-owned portion of an SSS, they are considered SSOs.

Not Applicable

This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri State Environmental Laws and Regulations to allow untreated wastewater to discharge to waters of the state.

SCHEDULE OF COMPLIANCE (SOC):

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

Applicable

The Interim Limits provide Doe Run three years to make the changes necessary to meet the lower effluent limits for Arsenic, and Copper, as they are now Water Quality Based Effluent Limits rather than the Technology Based Categorical Allowances. Lead and Zinc effluent limits are effective immediately as the limits are Technology Based Categorical Limits.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in February 2009. BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.

Applicable

A SWPPP shall be developed/modified and implemented for each site and shall incorporate required practices identified by the department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.

VARIANCE:

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

Not Applicable

This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

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

Applicable

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

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

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

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

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

WLA MODELING:

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

Not Applicable

A WLA study was either not submitted or determined not applicable by department staff.

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:

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

Applicable

In accordance with the Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System. Furthermore, WET testing is a means by which the department determines that [10 CSR 20-7.031(3)(D, F, & G)] are being met by the permitted facility. In addition to justification for the WET testing, WET tests are required under [10 CSR 20-6.010(8)(A)4] to be performed by specialists who are properly trained in conducting the test according to the methods prescribed by the Federal Government as referenced in [40 CFR Part 136]. WET test will be required by all facilities meeting the following criteria:

- Facility is a designated Major.
- Facility continuously or routinely exceeds its design flow.
- Facility (industrial) that alters its production process throughout the year.
- Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH3)
- Facility is a municipality or domestic discharger with a Design Flow > 22,500 gpd.
- Other - Please justify

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

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

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

Applicable

The Mississippi River is listed on the 1998 Missouri 303(d) List for lead and zinc.

- This facility is considered to be a source of or has the potential to contribute to the above listed pollutant(s).
The TMDL is currently being developed for the Mississippi River. Once the TMDL is complete and approved, the permit will be reopened to incorporate the new discharge wasteload allocations.

Part V – Effluent Limits Determination

Outfall #001 – Main Facility Outfall

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*	NO	
TSS	LBS/DAY	1,2	379.3		206.5	YES	350.15/193.1
pH	SU	1	**		**	YES	7.5-10.0
HARDNESS, TOTAL AS CaCO ₃	MG/L	1,9	*		*	YES	***
ARSENIC, TOTAL RECOVERABLE	LBS/DAY	2,3	3.98		1.69	YES	12.861/5.216
CADMIUM, TOTAL RECOVERABLE	LBS/DAY	2,3	1.22		0.61	YES	1.964/0.785
COPPER, TOTAL RECOVERABLE	LBS/DAY	2,3	2.77		1.40	YES	11.839/4.750
LEAD, TOTAL RECOVERABLE	LBS/DAY	2,3	3.03		1.26	YES	2.749/1.127
ZINC, TOTAL RECOVERABLE	LBS/DAY	2,3	11.04		3.73	YES	10.016/3.307
ANTIMONY, TOTAL RECOVERABLE	µG/L	1,2,9	*		*	YES	***
THALLIUM, TOTAL RECOVERABLE	µG/L	1,2,9	*		*	YES	***
PHENOL	MG/L	1,2,9	*		*	YES	***
WHOLE EFFLUENT TOXICITY (WET) TEST	TU	1, 11	Please see WET Test in the Derivation and Discussion Section below.				

* - Monitoring requirement only.

** - pH is measured in pH units and is not to be averaged. The pH is limited to the range of 7.5-10.0 pH units.

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

Note- Previous permit for metals contained monitoring in mg/l; this is a change to micrograms/liter (µg/l).

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Total Suspended Solids (TSS).** An allowance was given for TSS in both Best Practicable Control Technology Currently Available (BPT) and in New Source Performance Standards (NSPS), but not in the Best Achievable Technology Economically Achievable (BAT). Best Conventional Pollutant Control Technology (BCT) is to address this issue; however it has not yet been developed, so the BPT allowance is being used. Based on the production values reported, the MDL is 240 lbs/day and the AML is 123 lbs/day. See Appendix B, Table 6 for the calculations.
- **pH.** Categorical limits in 40 CFR 421 Subpart G require the discharge to be between 7.5 and 10.0 standard units. Therefore the pH limits are set at 7.5-10.0 standard units. Because of the very large dilution available in the receiving stream, and relatively small discharge volume, these limits are deemed protective of the instream standard of 6.5-9.0.
- **Phenol.** Monitoring requirement only. Monitoring for phenols is included to determine whether “reasonable potential” to exceed water quality standards exists. The department will review the submitted data to determine if limitations will be required or if the parameter can be removed from the permit.
- **Hardness, Total as CaCO₃.** Monitoring to verify hardness of effluent discharged from this outfall. Metals toxicity is influenced by total hardness.

Metals

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and “The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion” (EPA 823-B-96-007). General warm-water fishery criteria apply and water hardness = 215 mg/L.

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the department, partitioning evaluations may be considered and site-specific translators developed.

METAL	CONVERSION FACTORS	
	ACUTE	CHRONIC
ANTIMONY	NA	NA
ARSENIC	NA	NA
CADMIUM	0.912	0.877
COPPER	0.960	0.960
LEAD	0.679	0.679
SILVER	0.85	NA
THALLIUM	NA	NA
ZINC	0.98	0.98

Conversion factors for Cd, Cu.,Pb and Zn are hardness dependent. Values calculated using equation found in Section 1.3 of EPA 823-B-96-007 and hardness = 215 mg/L.

Metal background and hardness concentrations are based on the averages recorded at the United States Gaging Station # 07010000, located on the Mississippi River approximately 22 miles upstream from Doe Run Herculaneum Smelter.

- **Antimony, Total Recoverable.** Monitoring requirement only. Monitoring for antimony is included to determine whether “reasonable potential” to exceed water quality standards exists. The department will review the submitted antimony data to determine if limitations will be required or if the parameter can be removed from the permit.
- **Arsenic, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 20 µg/L (total recoverable). Background concentration = 3.41 µg/L. Water Quality Based Effluent Limits Daily Maximum 2,258 lbs/day, 1,125 lbs/day Monthly Average. Categorical Allowance Daily Maximum is 3.98 lbs/day and Average Monthly is 1.69 lbs/day. Categorical effluent limits are more protective (see Appendix B, Table 5 for calculations), therefore no concentration based effluent limits calculated.
- **Cadmium, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 0.4 µg/L, Acute Criteria = 10.0 µg/L. Background concentration = 0.033 µg/L. Categorical Allowance Daily Maximum is 1.95 lbs/day and Average Monthly is 0.79 lbs/day, see Appendix B Table 3. Water Quality based effluent limits are more protective.

Chronic = $0.42/0.877 = 0.48 \mu\text{g/L}$

Acute = $10.01/0.912 = 10.98 \mu\text{g/L}$

Chronic WLA: $C_e = ((1.08 + 15,425)0.48 - (15,425 * 0.033))/1.08$
 $C_e = 6,933 \mu\text{g/L}$

Acute WLA: $C_e = ((1.08 + 10.8)10.98 - (10.8 * 0.033))/1.08$
 $C_e = 120.4 \mu\text{g/L}$

$LTA_c = 6933 (0.527) = 3654 \mu\text{g/L}$

$LTA_a = 120.4 (0.321) = 38.6 \mu\text{g/L}$

$MDL = 38.6 (3.11) = 120.0 \mu\text{g/L}$

$AML = 38.6 (1.55) = 59.8 \mu\text{g/L}$

[CV = 0.6, 99th Percentile]

[CV = 0.6, 99th Percentile]

[CV = 0.6, 99th Percentile]

[CV = 0.6, 95th Percentile, n = 4]

$MDL = (1.224)(0.120)(8.34) = 1.22 \text{ lbs/day}$

$AML = (1.224)(0.0598)(8.34) = 0.61 \text{ lbs/day}$

- **Copper, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 17.2 µg/L, Acute Criteria = 27.6 µg/L. Background concentration = 4.54 µg/L. Categorical Allowance Daily Maximum is 3.67 lbs/day and Average Monthly is 1.60 lbs/day, see Appendix B, Table 5 for calculations. Water quality based effluent limits are more protective.

$$\text{Chronic} = 17.2/0.960 = 17.9 \mu\text{g/L}$$

$$\text{Acute} = 27.6/0.960 = 28.8 \mu\text{g/L}$$

$$\text{Chronic WLA: } C_e = ((1.08 + 15,425)17.9 - (15,425 * 4.54))/1.08$$

$$C_e = 190,831 \mu\text{g/L}$$

$$\text{Acute WLA: } C_e = ((1.08 + 10.8)28.8 - (10.8 * 4.54))/1.08$$

$$C_e = 271 \mu\text{g/L}$$

$$LTA_c = 190,831 (0.527) = 100,568 \mu\text{g/L}$$

[CV = 0.6, 99th Percentile]

$$LTA_a = 271 (0.321) = 87 \mu\text{g/L}$$

[CV = 0.6, 99th Percentile]

$$\text{MDL} = 87 (3.11) = 271 \mu\text{g/L}$$

[CV = 0.6, 99th Percentile]

$$\text{AML} = 87 (1.55) = 135 \mu\text{g/L}$$

[CV = 0.6, 95th Percentile, n = 4]

$$\text{MDL} = (1.224)(0.271)(8.34) = 2.77 \text{ lbs/day}$$

$$\text{AML} = (1.224)(0.135)(8.34) = 1.40 \text{ lbs/day}$$

- **Lead, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 5.7 µg/L, Acute Criteria = 147 µg/L. Background concentration = 2.8 µg/L. Categorical Allowance Daily Maximum is 3.03 lbs/day and Average Monthly is 1.26 lbs/day. Categorical effluent limits are more protective (see Appendix B, Table 5 for calculations), therefore no concentration based effluent limits calculated.

- **Silver, Total Recoverable.** Monitoring removed, no reasonable potential.
- **Thallium, Total Recoverable.** Monitoring requirement only. Monitoring for thallium is included to determine whether “reasonable potential” to exceed water quality standards exists. The department will review the submitted thallium data to determine if limitations will be required or if the parameter can be removed from the permit.
- **Zinc, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 225 µg/L, Acute Criteria = 225 µg/L. Background concentration = 11.19 µg/L. Categorical Allowance Daily Maximum is 11.04lbs/day and Average Monthly is 3.73 lbs/day. Categorical effluent limits are more protective (see Appendix B, Table 5 for calculations), therefore no concentration based effluent limits calculated.

COMPARISON OF WATER QUALITY BASED EFFLUENT LIMITS VS. CATEGORICAL LIMITS

A comparison must be made of all calculated water quality based effluent limits and categorical limits. The most protective limit appears in the permit.

TABLE 1: COMPARISON OF WATER QUALITY BASED EFFLUENT LIMITS VS. CATEGORICAL LIMITS (LBS/DAY)

PARAMETER	CATEGORICAL ALLOWANCE (LBS/DAY)		WATER QUALITY BASED EFFLUENT LIMIT (LBS/DAY)	
	DAILY MAX	MONTHLY AVG.	DAILY MAX	MONTHLY AVG.
ARSENIC	3.98	1.69	2,258	1,125
CADMIUM	1.95	0.79	1.22	0.61
COPPER	3.67	1.60	2.77	1.40
LEAD	3.03	1.26	13.63	6.80
TSS	379.3	206.5	NA	NA
ZINC	11.04	3.73	14.03	6.99

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

Chronic WET Test Toxic Units

Acute

$$\text{WET WLA}_a = ((1.08+10.80)0.3-(10.80*0.0))/1.08 = 3.31$$

A default acute to chronic ratio (ACR) value of 10 is used based on the information presented in Chapter 1 and Appendix A of the TSD.

$$\text{WLA}_{a,c} = \text{WLA}_a \times \text{ACR}$$

$$\text{WET WLA}_{a,c} = 10 (3.3\text{TU}_a) = 33.1\text{TU}_{a,c}$$

Chronic

$$\text{WET WLA}_c = ((1.08+15,425)1.0-(15,425*0.0))/1.08 = 14,283 \text{ TU}_c$$

The acute WLA is converted to a long-term average concentration (LTA_{a,c}) using the following equation:

$$\begin{aligned} \text{LTA}_{a,c} &= 33.1 \text{ TU}_{a,c}(0.321) = \mathbf{10.6 \text{ TU}_{a,c} = 1.06 \text{ TU}_a} && [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}] \\ \text{LTA}_c &= 14,283.3 \text{ TU}_c (0.527) = 7,527 \text{ TU}_c && [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}] \end{aligned}$$

The more protective LTA is used:

$$\text{MDL} = 1.06 \text{ TU}_a(3.11) = 3.30 \text{ TU}_a \quad [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}]$$

Because sampling is done less than once per month, only a Daily Maximum limit will apply.

Outfall #003– Acid Plant Outfall

Non-contact cooling water is not subject to categorical limits; therefore water quality based effluent limits will be applied.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*	No	
pH	SU	1	**		**	YES	6.0-9.0
TEMPERATURE	°C	1, 9	*		*	YES	°F
ARSENIC, TOTAL RECOVERABLE	µg/L	1, 2, 9	*		*	YES	****
CADMIUM, TOTAL RECOVERABLE	µg/L	1, 2, 9	*		*	YES	****
COPPER, TOTAL RECOVERABLE	µg/L	1, 2, 9	*		*	YES	****
LEAD, TOTAL RECOVERABLE	µg/L	1, 2, 9	*		*	YES	****
ZINC, TOTAL RECOVERABLE	µg/L	1, 2, 9	*		*	YES	****
OIL AND GREASE	MG/L	1	15		10	No	
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

** - pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units

*** - Previous permit contained monitoring only in mg/l; this is a change to micrograms/liter (µg/l)

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #003– DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **pH.** pH shall be maintained in the range from six and half to nine (6.5 – 9.0) standard units [10 CSR 20-7.031(4)(E)].
- **Temperature.** Outfall contains non-contact cooling water. Monitoring requirements only.
- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **Arsenic, Total Recoverable.** Monitoring Requirement only. Parameter retained from previous operating permit.
- **Cadmium, Total Recoverable.** Monitoring Requirement only. Parameter retained from previous operating permit.
- **Copper, Total Recoverable.** Monitoring Requirement only. Parameter retained from previous operating permit.
- **Lead, Total Recoverable.** Monitoring Requirement only. Parameter retained from previous operating permit.
- **Zinc, Total Recoverable.** Monitoring Requirement only. Parameter retained from previous operating permit.

Outfall #004 – Stormwater Run-off from slag pile area

The stormwater run-off from the slag pile area flows into Joachim Creek and the Mississippi River. The remediation of the slag pile is covered under the Administrative Order of Consent. During the previous permit cycle, there were no reported discharges from these outfalls; however the slag pile area still exist.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1, 9	*		*	YES	***
ARSENIC, TOTAL RECOVERABLE	µG/L	9	*		*	YES	***
CADMIUM, TOTAL RECOVERABLE	µG/L	9	*		*	YES	***
COPPER, TOTAL RECOVERABLE	µG/L	9	*		*	YES	***
LEAD, TOTAL RECOVERABLE	µG/L	9	*		*	YES	***
ZINC, TOTAL RECOVERABLE	µG/L	9	*		*	YES	***
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

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

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #004 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **pH.** pH shall be maintained in the range from six to nine (6.5 – 9.0) standard units [10 CSR 20-7.031(4)(E)].
- **Arsenic, Total Recoverable.** Monitoring requirement only. Monitoring is included to determine whether “reasonable potential” to exceed water quality standards exists.
- **Cadmium, Total Recoverable.** Monitoring requirement only. Monitoring is included to determine whether “reasonable potential” to exceed water quality standards exists.
- **Copper, Total Recoverable.** Monitoring requirement only. Monitoring is included to determine whether “reasonable potential” to exceed water quality standards exists.
- **Lead, Total Recoverable.** Monitoring requirement only. Monitoring is included to determine whether “reasonable potential” to exceed water quality standards exists.
- **Zinc, Total Recoverable.** Monitoring requirement only. Monitoring is included to determine whether “reasonable potential” to exceed water quality standards exists.

- **Precipitation.** Monitoring Requirement only.
- **Settleable Solids.** In the absence of effluent regulation, Best Professional Judgment used to set effluent limits consistent with other industrial facilities. Daily maximum 1.5 ml/L/hr., monthly average 1.0 ml/L/hr.

Part VI – Administrative Requirements

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

PUBLIC NOTICE:

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

The department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

This modification was placed on public notice from January 6, 2012 to February 6, 2012. Comments were received from the permittee, which indicated several non substantive typographical errors. These have been corrected. One substantial change was requested, and this has been granted. For deficiencies noted in with BMPs, corrective action must be initiated within 7 days. The previous permit language required that corrective action be completed within 7 days.

DATE OF FACT SHEET: SEPTEMBER 16, 2009, REVISED JULY 19, 2010, AND FEBRUARY 22, 2012

COMPLETED BY:

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Part VII – Appendices

APPENDIX A - FACILITY OUTFALL DESCRIPTIONS

Outfall #001

Industrial process wastewater and process storm water is treated in a wastewater plant with a design capacity of 1.224 MGD. The treatment consists of the following unit processes:

7. Flocculation
8. Neutralization
9. Sedimentation
10. Sand/Anthracite Filtration
11. Clarification
12. Sludge thickening/dewatering

Legal Description: NE ¼, SE ¼ Sec. 29, T41N, R6E

UTM Coordinates: X=729862, Y=4238134

Receiving Stream: Mississippi River (P)

First Classified Stream and ID: Mississippi River (01707)

USGS Basin & Sub-watershed No.: (07140101-150005)

Outfall #002 – Outfall capped; monitoring eliminated

Outfall #003

Acid plant non-contact cooling water, no treatment/non-contact cooling water.

Legal Description: NE ¼, SE ¼ Sec. 29, T41N, R6E

UTM Coordinates: X=729797, Y=4238167

Receiving Stream: Mississippi River (P)

First Classified Stream and ID: Mississippi River (01707)

USGS Basin & Sub-watershed No.: (07140101-150005)

Outfall #004

Storm water runoff from slag storage area, no treatment

Legal Description: NE ¼, SE ¼ Sec. 29, T41N, R6E

UTM Coordinates: X=729797, Y=42381667

Receiving Stream: Joachim Creek (P)

First Classified Stream and ID: Joachim Creek (01719)

USGS Basin & Sub-watershed No.: (07140101-150005)

APPENDIX B – OUTFALL #001 PRIMARY LEAD CATEGORICAL ALLOWANCE CALCULATIONS

Effluent limitations for arsenic, cadmium, copper, lead, zinc, and TSS, from the process wastewater contribution to Outfall 001 are calculated using the effluent limits below and the daily production rates of 0.00029 billion pounds of dross reverberatory slag granulation, 0.002148 billion pounds of primary lead bullion, and 0.648 million pounds of 100% sulfuric acid capacity.

Flow Data for Outfall 001 from 2008 and 2009 showed an overall average of 0.41 MGD (285 gpm). Based on documentation from Doe Run, the flows from categorical processes are estimated to be 184.51 gpm. Subtracting the flows of categorical processes from the long term average flow leaves the average of 100.49 gpm (0.145 MGD) as the average “non-scope” flow.

Pollutant allowances for non-scope flows were calculated using BPJ. Treatment performance was calculated using the contaminant values found in Table VII-21, on page 248 of Volume I, of the EPA Final Development Document for Effluent Limitations Guidelines and Standards for the Nonferrous Metals Manufacturing Point Source Category. Treatment performance was used on the Precipitation-Settling-Filtration “LS&F” Technology System.

TABLE 1: MAXIMUMS PER PROCESS

Dross Reverberatory slag granulation given in (lbs/10⁹ lbs of slag, matte, or speiss granulated) (Note 1)			
Pollutant	Daily Maximum	Monthly Average	Regulation
Lead (BAT)	1612.00	748.40	40 CFR 421.73 (d)
Zinc(BAT)	5872.00	2418.00	40 CFR 421.73 (d)
TSS (BPT)*	236000	112300	40 CFR 421.72 (d)
Cadmium (BAT)	1151.00	460.60	Categorical Allowance, Table X-3 (d) pg. 1785**
Employee handwash given in (lbs/10⁹ lbs of lead bullion produced)			
Pollutant	Daily Maximum	Monthly Average	Regulation
Lead (BAT)	0.924	0.429	40 CFR 421.73 (j)
Zinc(BAT)	3.366	1.386	40 CFR 421.73 (j)
TSS (BPT)	135.3	64.35	40 CFR 421.72 (j)
Cadmium (BAT)	0.660	0.264	Categorical Allowance, Table X-3(j) pg. 1788
Respirator wash given in (lbs/10⁹ lbs of lead bullion produced)			
Pollutant	Daily Maximum	Monthly Average	Regulation
Lead (BAT)	1.484	0.689	40 CFR 421.73 (k)
Zinc(BAT)	5.406	2.226	40 CFR 421.73 (k)
TSS (BPT)	217.3	103.4	40 CFR 421.72 (k)
Cadmium (BAT)	1.06	0.424	Categorical Allowance, Table X-3 (k), pg. 1789
Laundering of uniforms given in (lbs/10⁹ lbs of lead bullion produced)			
Pollutant	Daily Maximum	Monthly Average	Regulation
Lead (BAT)	4.34	2.015	40 CFR 421.73 (l)
Zinc(BAT)	15.81	6.51	41 CFR 421.73 (l)
TSS (BPT)	635.5	302.3	40 CFR 421.72 (l)
Cadmium (BAT)	3.2	1.28	Categorical Allowance, Table X-3 (l), pg. 1789
Metallurgical Acid Plants Subcategory given in (lbs/10⁶ lbs of 100% sulfuric acid capacity)			
Pollutant	Daily Maximum	Monthly Average	Regulation
Arsenic (BAT)	3.55	1.58	40 CFR 421.93
Cadmium (BPT)	0.18	0.09	40 CFR 421.92
Copper (BAT)	3.27	1.56	40 CFR 421.93
Lead (BAT)	0.72	0.33	40 CFR 421.93
Zinc (BAT)	2.61	1.07	40 CFR 421.93
TSS(BPT)	304.00	152.00	40 CFR 421.92

* An allowance was given for TSS in both Best Practicable Control Technology Currently Available (BPT) and in New Source Performance Standards (NSPS), but not in the Best Achievable Technology Economically Achievable (BAT). Best Conventional Pollutant Control Technology (BCT) is to address this issue; however it has not yet been developed, so the BPT allowance is being used.

** Development Document for Effluent Limitation Guidelines and Standards for the Nonferrous Metals Manufacturing Point Source Category, Volume IV, May 1989, (EPA440/1-89-019.4)

Note 1- Dross Reverbatory values for slag granulation are used as the Effluent Limit Guidelines do not further define the allowances for slag granulation from blast furnaces.

Table 2: Arsenic Categorical Allowance Calculation

Arsenic (Categorical Allowance) Daily Maximum			
Process	Production	Daily Max	lbs produced
Met Acid Plant	0.648	3.55	2.30
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			2.30
Arsenic (Non-Scope) Daily Maximum			
Process	Flow	Daily Max mg/L	lbs produced
Non-scope Flow	0.145	1.39	1.68
lbs produced= Flow (MGD)*daily max(mg/L)*8.34			1.68
Arsenic Total Allowances Daily Maximum= Arsenic(Non-Scope) + Arsenic(Categorical Allowance)=			3.98 lbs/day
Arsenic (Categorical Allowance) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
Met Acid Plant	0.648	1.58	1.03
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg.(lbs/m/billion lbs)})$			1.03
Arsenic (Non-Scope) Monthly Average			
Process	Flow	Monthly Avg.	lbs produced
Non-scope flow	0.145	0.55	0.66
lbs produced= Flow (MGD)*daily max(mg/L)*8.34			0.66
Arsenic Total Allowances Monthly Average= Arsenic(Non-Scope) + Arsenic(Categorical Allowance)=			1.69 lbs/day

Table 3: Cadmium Categorical Allowance Calculation

Cadmium (Categorical Allowance) Daily Maximum			
Process	Production	Daily Max	lbs produced
Dross Reverb Slag Gran	0.00029	1151.00	0.33
Employee Hand Wash	0.002184	0.66	0.00
Respirator Wash	0.002184	1.06	0.00
Uniform laundry	0.002184	3.2	0.01
Met Acid Plant	0.648	0.18	0.12
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			0.46
Cadmium (Non-Scope) Daily Maximum			
Process	Production	Daily Max	lbs produced
storm water runoff	3.603	0.2	0.72
non-contact cooling water	0.48	0.2	0.10
miscellaneous flows	3.362	0.2	0.67
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			1.49
Cadmium Total Allowances Daily Maximum= Cadmium(Non-Scope) + Cadmium(Categorical Allowance)= 1.49+0.24=			1.95 lbs/day
Cadmium (Categorical Allowance)Monthly Average			
Process	Production	Monthly Avg.	lbs produced
Dross Reverb Slag Gran	0.00029	460.60	0.13
Employee Hand Wash	0.002184	0.264	0.00
Respirator Wash	0.002184	0.424	0.00
Uniform laundry	0.002184	1.28	0.00
Met Acid Plant	0.648	0.09	0.06
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			0.19
Cadmium (Non-Scope)Monthly Average			
Process	Production	Monthly Avg.	lbs produced
storm water runoff	3.603	0.08	0.29
non-contact cooling water	0.48	0.08	0.04
miscellaneous flows	3.362	0.08	0.27
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			0.60
Cadmium Total Allowances Monthly Average= Cadmium(Non-Scope) + Cadmium(Categorical Allowance)= 0.60+0.11=			0.79 lbs/day

Table 4: Copper Categorical Allowance Calculation

Copper (Categorical Allowance) Daily Maximum			
Process	Production	Daily Max	lbs produced
Met Acid Plant	0.648	3.27	2.12
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			2.12
Copper (Non-Scope) Daily Maximum			
Process	Flow	Daily Max	lbs produced
Non-scope flow	0.145	1.28	1.55
lbs produced= Flow (MGD)*daily max(mg/L)*8.34			1.55
Copper Total Allowances Daily Maximum= Copper(Non-Scope) + Copper(Categorical Allowance)=			3.67 lbs/day
Copper (Categorical Allowance) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
Met Acid Plant	0.648	1.56	1.01
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			1.01
Copper (Non-Scope) Monthly Average			
Process	Flow	Monthly Avg.	lbs produced
Non-scope flow	0.145	0.49	0.59
lbs produced= Flow (MGD)*daily max(mg/L)*8.34			0.59
Copper Total Allowances Monthly Average= Copper(Non-Scope) + Copper(Categorical Allowance)=			1.60 lbs/day

Table 5: Lead Categorical Allowance Calculation

Lead (Categorical Allowance) Daily Maximum			
Process	Production	Daily Max	lbs produced
Dross Reverb Slag Gran	0.00029	1612.00	0.47
Employee Hand Wash	0.002184	0.924	0.002
Respirator Wash	0.002184	1.484	0.003
Uniform laundry	0.002184	4.34	0.01
Met Acid Plant	0.648	0.72	0.46
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			0.95
Lead (Non-Scope) Daily Maximum			
Process	Production	Daily Max	lbs produced
storm water runoff	3.603	0.28	1.01
non-contact cooling water	0.48	0.28	0.13
miscellaneous flows	3.362	0.28	0.94
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			2.08
Lead Total Allowances Daily Maximum= Lead(Non-Scope) + Lead(Categorical Allowance)= 0.64+2.08=			3.03 lbs/day
Lead (Categorical Allowance) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
Dross Reverb Slag Gran	0.00029	748.40	0.22
Employee Hand Wash	0.002184	0.429	0.00
Respirator Wash	0.002184	0.689	0.00
Uniform laundry	0.002184	2.015	0.00
Met Acid Plant	0.648	0.33	0.22
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			0.44
Lead (Non-Scope) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
storm water runoff	3.603	0.11	0.40
non-contact cooling water	0.48	0.11	0.05
miscellaneous flows	3.362	0.11	0.37
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			0.82
Lead Total Allowances Monthly Average= Lead(Non-Scope) + Lead(Categorical Allowance)= 0.27+0.82=			1.26 lbs/day

Table 6: Total Suspended Solids Categorical Allowance Calculation

TSS (Categorical Allowance) Daily Maximum			
Process	Production	Daily Max	lbs produced
Dross Reverb Slag Gran	0.00029	236000	68.44
Employee Hand Wash	0.002184	135.3	0.30
Respirator Wash	0.002184	217.3	0.47
Uniform laundry	0.002184	635.5	1.39
Met Acid Plant	0.648	304.00	196.99
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			267.6
TSS (Non-Scope) Daily Maximum			
Process	Production	Daily Max	lbs produced
storm water runoff	3.603	15	54.0
non-contact cooling water	0.48	15	7.2
miscellaneous flows	3.362	15	50.4
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			111.7
TSS Total Allowances Daily Maximum= TSS(Non-Scope) + TSS(Categorical Allowance)= 111.7+222.3=			379.3 lbs/day
TSS (Categorical Allowance) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
Dross Reverb Slag Gran	0.00029	112300	32.57
Employee Hand Wash	0.002184	64.35	0.14
Respirator Wash	0.002184	103.4	0.23
Uniform laundry	0.002184	302.3	0.66
Met Acid Plant	0.648	152.00	98.50
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			132.09
TSS (Non-Scope) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
storm water runoff	3.603	10	36.03
non-contact cooling water	0.48	10	4.80
miscellaneous flows	3.362	10	33.62
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			74.45
TSS Total Allowances Monthly Average= TSS(Non-Scope) + TSS(Categorical Allowance)= 74.45+110.53=			206.5 lbs/day

Table 7: Zinc Categorical Allowance Calculation

Zinc (Categorical Allowance) Daily Maximum			
Process	Production	Daily Max	lbs produced
Dross Reverb Slag Gran	0.00029	5872.00	1.70
Employee Hand Wash	0.002184	3.366	0.01
Respirator Wash	0.002184	5.406	0.01
Uniform laundry	0.002184	15.81	0.03
Met Acid Plant	0.648	2.61	1.69
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			3.44
Zinc (Non-Scope) Daily Maximum			
Process	Production	Daily Max	lbs produced
storm water runoff	3.603	1.02	3.68
non-contact cooling water	0.48	1.02	0.49
miscellaneous flows	3.362	1.02	3.43
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{daily max(lbs/m/billion lbs)})$			7.59
Zinc Total Allowances Daily Maximum= Zinc(Non-Scope) + Zinc(Categorical Allowance)			11.04 lbs/day
Zinc (Categorical Allowance) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
Dross Reverb Slag Gran	0.00029	2418.00	0.70
Employee Hand Wash	0.002184	1.386	0.00
Respirator Wash	0.002184	2.226	0.00
Uniform laundry	0.002184	6.51	0.01
Met Acid Plant	0.648	1.07	0.70
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg (lbs/m/billion lbs)})$			1.42
Zinc (Non-Scope) Monthly Average			
Process	Production	Monthly Avg.	lbs produced
storm water runoff	3.603	0.31	1.12
non-contact cooling water	0.48	0.31	0.15
miscellaneous flows	3.362	0.31	1.04
lbs produced= $\Sigma(\text{production(m/billion lbs/day)} * \text{monthly avg(lbs/m/billion lbs)})$			2.31
Zinc Total Allowances Monthly Average= Zinc(Non-Scope) + Zinc(Categorical Allowance)			3.73 lbs/day