

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 2305-AOP-R6 AFIN: 47-00991

1. PERMITTING AUTHORITY:

Arkansas Division of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Big River Steel LLC
2027 E. State Hwy 198
Osceola, Arkansas 72370

3. PERMIT WRITER:

Jesse Smith

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Iron and Steel Mills and Ferroalloy Manufacturing
NAICS Code: 33111

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

| Date of Application | Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment) | Short Description of Any Changes That Would Be Considered New or Modified Emissions |
|---------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 8/20/2019 | Modification | New sources, updated BACT limits, increased throughput in some sources |

6. REVIEWER'S NOTES:

Big River Steel, LLC owns and operates a steel mill located at 2027 E. State Hwy 198 in Osceola, AR. This permitting modification makes the following changes to the existing permit:

- Adds the following new sources to the permit: Lime Injector Burner I and II (SN-01A and SN-02A), Caster #1 and #2 (SN-14 and SN-15), Tunnel Furnace Shuttle Zone (SN-21C), Emergency Generator 10 and 11 (SN-67D and SN-67E), four emergency water pumps (SN-104A through SN-104D), and an EAF I/II Lime Injection System (SN-103).

- Updated BACT for some existing sources and included BACT analysis for new sources.
- Increased throughput for EAF II and LMF II (SN-02) to match the rates of EAF I and LMF I (SN-01).
- Increased PM/PM₁₀/PM_{2.5} emissions from the tunnel furnaces (SN-20 and SN-21) due to an emission factor change.
- Increased the power rating of Emergency Generators 5 through 9 (SN-66, SN-67, SN-67A, SN-67B, and SN-67C) from 2000 kW each to 2700 kW each.
- Increased TDS limits for all permitted cooling tower sources by four times. The cooling towers require four passes, but the permit was currently limiting the TDS to the amount required in one pass. Emissions of cooling tower sources updated as well with this change.
- Increased throughput for the Carbon Injection Receiving system (SN-84) from 49,210 tons/year to 79,204 tons/year.
- Increased throughput to the slag handling operations (SN-95, SN-96, and SN-99B) from 488,980 tons/year to 650,000 tons/year.
- Added Air Products Cooling Towers #1 and #2 to the insignificant activities list.
- Some other miscellaneous changes to permit condition wording and error corrections.

The permitted emission changes for this permitting action are as follows: Increase of 29.7 tpy PM, increase of 29.0 tpy PM₁₀, increase of 28.6 tpy PM_{2.5}, increase of 31.2 tpy SO₂, increase of 17.4 tpy VOC, increase of 381.6 tpy CO, increase of 102.9 tpy NO_x, increase of 0.100079 tpy Lead, increase of 113,771 tpy CO_{2e}, and an increase of 0.7 tpy H₂SO₄.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

The facility has a currently open Consent Administrative order.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? Y
If yes, were GHG emission increases significant? N

b) Is the facility categorized as a major source for PSD? Y

- *Single pollutant ≥ 100 tpy and on the list of 28 or single pollutant ≥ 250 tpy and not on list*

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

| Source | Pollutant | Regulation (NSPS, NESHAP or PSD) |
|-------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 01 and 02 | Particulate | NSPS AAa |
| 01 and 02 | HAPs | MACT YYYYYY |
| All Boilers | None | NSPS Dc |
| SN 53 | VOC | NSPS TT |
| All | NO _x , CO, PM, PM ₁₀ , PM _{2.5} , SO ₂ , VOC, lead, and greenhouse gasses. | PSD |
| Generators | Criteria and HAPs | NSPS IIII, and MACT ZZZZ |
| 100 | HAP | NESHAP CCCCCC |

10. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? N

11. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

12. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

Based upon the information submitted with the application for this permitting action, all regulated air pollutants for this project are below EPA’s Significant Impact Levels and result in what is considered an insignificant change except for PM_{2.5} and NO_x. Further screening shows that both the PM_{2.5} and NO_x modeling results in insignificant changes. Therefore, previous modeling performed for this facility is still representative.

b) Non-Criteria Pollutants:

Non-Criteria Pollutant evaluation is based on permit 2305-AOP-R0 results as all HAP emission rates have either remained the same or not increased to a level that would significantly impact previous modelling results.

1st Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Department has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value

(mg/m³), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

| Pollutant | TLV (mg/m ³) | PAER (lb/hr) = 0.11 × TLV | Proposed lb/hr | Pass? |
|--------------|--------------------------|---------------------------|----------------|-------|
| Formaldehyde | 15 | 1.65 | 0.1236 | Yes |
| Arsenic | 0.01 | 0.0011 | 0.0043 | No |
| Cadmium | 0.01 | 0.0011 | 0.00583 | No |
| HCl | 3 | 0.33 | 1.0 | No |
| Manganese | 0.2 | 0.022 | 0.161 | No |
| Mercury | 0.01 | 0.0011 | 0.061 | No |

2nd Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each compound has been deemed by the Department to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

| Pollutant | PAIL (µg/m ³) = 1/100 of Threshold Limit Value | Modeled Concentration (µg/m ³) | Pass? |
|-----------|------------------------------------------------------------|--------------------------------------------|-------|
| Arsenic | 0.1 | 0.049 | Yes |
| Cadmium | 0.1 | 0.0003 | Yes |
| HCl | 30 | 0.0007 | Yes |
| Manganese | 2 | 0.012 | Yes |
| Mercury | 0.1 | 0.0043 | Yes |

c) H₂S Modeling:

A.C.A. §8-3-103 requires hydrogen sulfide emissions to meet specific ambient standards. Many sources are exempt from this regulation, refer to the Arkansas Code for details.

Is the facility exempt from the H₂S Standards Y
 If exempt, explain: No H₂S emissions

| Pollutant | Threshold value | Modeled Concentration (ppb) | Pass? |
|------------------|------------------------------------------------------------|-----------------------------|-------|
| H ₂ S | 20 parts per million (5-minute average*) | 0 | Y |
| | 80 parts per billion (8-hour average) residential area | 0 | Y |
| | 100 parts per billion (8-hour average) nonresidential area | 0 | Y |

*To determine the 5-minute average use the following equation

$$C_p = C_m (t_m/t_p)^{0.2} \text{ where}$$

C_p = 5-minute average concentration

C_m = 1-hour average concentration

t_m = 60 minutes

t_p = 5 minutes

13. CALCULATIONS:

| SN | Emission Factor Source (AP-42, testing, etc.) | Emission Factor (lb/ton, lb/hr, etc.) | Control Equipment | Control Equipment Efficiency | Comments |
|--------------------|-----------------------------------------------|---------------------------------------|-------------------|------------------------------|----------|
| All | All criteria pollutants based on BACT limits | | | | |
| 01 and 02 HAPs | AP-42 | Varied | Baghouse | 99%+ | |
| Natural Gas HAPs | AP-42 | Varied | None | | |
| Pickling Lines HCl | Manufacturer Estimates | Varied | Scrubbers | | |
| 100 | TANKS 4.0 software | | | | |

14. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

| SN | Pollutants | Test Method | Test Interval | Justification |
|-----------|--------------------------------------------|--------------------|--------------------|---------------------------------|
| 01 and 02 | PM, PM ₁₀ , PM _{2.5} , | 5D and 201 or 201A | Initial and annual | NSPS and PSD limit verification |
| 01 and 02 | AAa required | None specified | Initial and annual | NSPS |

| SN | Pollutants | Test Method | Test Interval | Justification |
|---------------------------------|---------------------------------------------------------------|-----------------------------|---------------------|---------------------------------------------------------------------------------|
| | information (fan motor amps, etc.) | | | requirement |
| 01 and 02 | NO _x , SO ₂ , CO, CO ₂ , VOC | 7E, 6C, 3A, 10, 25A | Semi annually | To verify compliance with BACT emission rates |
| 01 and 02 | Lead | 12 | Annually | To verify BACT limits |
| 04, 22, 26, 27, 101 | PM _{2.5} , CO, NO _x | 202, 10, 7E | Initial and 5 years | Verification of BACT emission limits |
| 03 | Flare design | 40 CFR 60.18(b) through (f) | Initial only | To verify flare is design is capable of achieving BACT limits |
| 03 | CO ₂ | Material analysis | Semi Annually | To show compliance with BACT limits |
| 39 51, 58, 60 53 54-56 | PM _{2.5} and PM ₁₀ | 202, 10, and 7E | Initial | To show compliance with BACT limits |
| 53 | VOC | 25A | Initial | NSPS TT Requirement |
| Cooling Towers | TDS | TDS testing | 6 months | Verification of BACT limits |
| Pickling Line Scrubbers | HCl | 26 | Initial | Verification of permit limits and ensure facility is not a Major Source of HAPs |

15. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

| SN | Parameter or Pollutant to be Monitored | Method (CEM, Pressure Gauge, etc.) | Frequency | Report (Y/N) |
|-----------|----------------------------------------|------------------------------------|---------------------------|--------------|
| 01 and 02 | AAa required monitoring | Fan amps, damper positions, etc. | Vary according to reading | Y |
| 52 | RTO temperature | Thermocouple | Continuous (3hr averages) | Y |

16. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

| SN | Recorded Item | Permit Limit | Frequency | Report (Y/N) |
|-------------------------|---------------------------|---------------------------------------------------------------|---------------|--------------|
| 01 and 02 | AAa Records | None | Vary | Y |
| 01 and 02 | YYYYY Records | None | Vary | Y |
| 03 | Degasser steel throughput | 1,500,000 tons per 12 months | Monthly | Y |
| 52 | Subpart TT Records | None | Vary | Y |
| Emergency Engines | Hours of operation | 100 | Monthly | Y |
| Cooling Towers | TDS readings | Vary per tower | Semi annually | Y |
| 82, 84, 86, 88, 90, 103 | Materials received | 175,830 79,204 175,830 680,000 680,000 210,240 | Monthly | Y |
| Slag Handling | Tons of slag | 650,000 | Monthly | Y |
| 100 | Gasoline Throughput | Less than 10,000 gallons per month | Monthly | Y |

17. OPACITY:

| SN | Opacity | Justification for limit | Compliance Mechanism |
|-------------------------|---------|--------------------------|--------------------------------|
| 01 and 02 | 3% | NSPS/BACT | Daily observations |
| 01 and 02 Meltshop | 6% | NSPS/BACT | Daily observations |
| All natural gas burners | 5% | BACT/Department Guidance | Combustion of natural gas only |
| 91 | 5% | BACT/Department Guidance | Weekly Observation |
| Rolling Mill sources | 5% | BACT/Department Guidance | Weekly Observation on building |

18. DELETED CONDITIONS:

| Former SC | Justification for removal |
|-----------|---------------------------|
| | |

| Former SC | Justification for removal |
|-----------|----------------------------------------------------------------------------------------------------------------------------|
| #4 and #5 | The permittee already must calculate actual emissions using throughput, and therefore the throughput limit is unnecessary. |
| 58 | Testing condition unneeded as facility has increased those limits being tested to AP-42 emissions factors |

19. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

| Source Name | Group A Category | Emissions (tpy) | | | | | | | |
|----------------------------------------|------------------|---------------------|-----------------|----------|-------|-----------------|-----------|-----------|-----------|
| | | PM/PM ₁₀ | SO ₂ | VOC | CO | NO _x | HAPs | | Lead |
| | | | | | | | Single | Total | |
| Water Bath Vaporizer | A-1 | 0.30 | 0.02 | 0.22 | 4.37 | 2.39 | 2.90 E-03 | 0.004 | 1.93 E-06 |
| Tundish Dryer | A-1 | 0.30 | 0.02 | 0.21 | 1.46 | 3.19 | 2.90 E-03 | 0.004 | 1.93 E-05 |
| Continuous Galvanizing Line Dryer | A-1 | 0.20 | 0.02 | 0.15 | 2.99 | 4.26 | 2.00 E-03 | 0.003 | 1.33 E-05 |
| Reformer Furnace (PHG830) | A-1 | 0.34 | 0.01 | 0.25 | 0.14 | 0.38 | 0.003 | 0.003 | - |
| Laboratory Test Furnace | A-1 | 6.7 E-04 | 5.2 E-05 | 4.8 E-04 | 0.008 | 0.009 | 1.60 E-04 | 1.60 E-04 | - |
| Diesel Fuel Tanks | A-3 | - | - | 0.004 | - | - | - | - | - |
| Engine Oil Tank | A-3 | - | - | 1.3 E-05 | - | - | - | - | - |
| Steel Cutting | A-7 | 0.4 | - | - | - | - | 0.001 | 0.002 | - |
| Induced Draft Mechanical Cooling Tower | A-13 | 0.56 | - | - | - | - | - | - | - |
| HCL Storage Tanks | A-13 | - | - | - | - | - | 0.02 | 0.02 | - |
| Air Products Cooling Towers #1 | A-13 | 1.48 | - | - | - | - | - | - | - |

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| | | | | | | | | | |
|--------|--|--|--|--|--|--|--|--|--|
| and #2 | | | | | | | | | |
|--------|--|--|--|--|--|--|--|--|--|

20. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

| Permit # |
|-------------|
| 2305-AOP-R5 |

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

Big River Steel LLC
 Permit #: 2305-AOP-R6
 AFIN: 47-00991

| | | | |
|---------------|--------------|-----------------------------------|------------------|
| \$/ton factor | 23.93 | Annual Chargeable Emissions (tpy) | <u>2292.8814</u> |
| Permit Type | Modification | Permit Fee \$ | <u>4340.9265</u> |

| | |
|-------------------------------------------------------------------------------|--------------------------|
| Minor Modification Fee \$ | 500 |
| Minimum Modification Fee \$ | 1000 |
| Renewal with Minor Modification \$ | 500 |
| Check if Facility Holds an Active Minor Source or Minor Source General Permit | <input type="checkbox"/> |
| If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$ | 0 |
| Total Permit Fee Chargeable Emissions (tpy) | 181.4010254 |
| Initial Title V Permit Fee Chargeable Emissions (tpy) | |

HAPs not included in VOC or PM: Chlorine, Hydrazine, HCl, HF, Methyl Chloroform, Methylene Chloride, Phosphine, Tetrachloroethylene, Titanium Tetrachloride

Air Contaminants: All air contaminants are chargeable unless they are included in other totals (e.g., H2SO4 in condensable PM, H2S in TRS, etc.)

| Pollutant (tpy) | Check if Chargeable Emission | Old Permit | New Permit | Change in Emissions | Permit Fee Chargeable Emissions | Annual Chargeable Emissions |
|-------------------|-------------------------------------|------------|------------|---------------------|---------------------------------|-----------------------------|
| PM | | 288.5 | 318.2 | 29.7 | | |
| PM ₁₀ | | 392.2 | 421.2 | 29 | 29 | 421.2 |
| PM _{2.5} | | 386.2 | 414.8 | 28.6 | | |
| SO ₂ | | 369.6 | 400.8 | 31.2 | 31.2 | 400.8 |
| VOC | | 212 | 229.4 | 17.4 | 17.4 | 229.4 |
| CO | | 4347.3 | 4728.9 | 381.6 | | |
| NO _x | | 1131.9 | 1234.8 | 102.9 | 102.9 | 1234.8 |
| Lead | <input checked="" type="checkbox"/> | 1.063778 | 1.1638574 | 0.1000794 | 0.1000794 | 1.1638574 |

| Pollutant (tpy) | Check if Chargeable Emission | Old Permit | New Permit | Change in Emissions | Permit Fee Chargeable Emissions | Annual Chargeable Emissions |
|--------------------------------|-------------------------------------|------------|------------|---------------------|---------------------------------|-----------------------------|
| Arsenic | <input checked="" type="checkbox"/> | 0.014496 | 0.015514 | 0.001018 | 0.001018 | 0.015514 |
| Cadmium | <input type="checkbox"/> | 0.019614 | 0.021156 | 0.001542 | | |
| Formaldehyde | <input type="checkbox"/> | 0.49846 | 0.5323 | 0.03384 | | |
| HCl | <input checked="" type="checkbox"/> | 3.5 | 3.5 | 0 | 0 | 3.5 |
| Manganese | <input type="checkbox"/> | 0.717005 | 0.803095 | 0.08609 | | |
| Mercury | <input checked="" type="checkbox"/> | 0.302105 | 0.402033 | 0.099928 | 0.099928 | 0.402033 |
| H ₂ SO ₄ | <input checked="" type="checkbox"/> | 0.9 | 1.6 | 0.7 | 0.7 | 1.6 |