

**WASHINGTON DEPARTMENT OF ECOLOGY
MAIL STOP 47600
OLYMPIA, WASHINGTON 98504**

IN THE MATTER OF AIR EMISSIONS FROM:

| | | |
|--------------------------|---|-------------------------|
| WestRock CP, LLC |) | NOC ORDER No. 4153-AQ07 |
| 801 Portland Avenue |) | Modification 1 |
| Tacoma, Washington 98421 |) | |

DESCRIPTION

WestRock CP, LLC (WestRock), previously Simpson Tacoma Kraft Company (Simpson), operates an integrated pulp and paper mill on approximately 60 acres adjacent to the mouth of the Puyallup River on Commencement Bay in Tacoma, Washington. The mill uses the Kraft process to produce market pulp and paper for linerboard, bags, sacks, and similar food and industrial grade packaging.

Notice of Construction (NOC) Approval Order No. 4153-AQ07 was issued on May 23, 2007 in accordance with RCW 70.94.152, WAC 173-400-110, and WAC 173-460-040. NOC Order No. 4153-AQ07 approved the installation of a 60-MW steam cogeneration unit as well as improvements to #4 Recovery Boiler and #7 Power Boiler.

On August 10, 2018, WestRock submitted an application to modify NOC Order No. 4153-AQ07, in accordance with WAC 173-400-111(8). The modification request was to restore the steam limit at #6 Power Boiler to original capacity following the installation of low-NOx burners. Following review, Ecology determined the application to be complete on September 4, 2018.

Based upon the complete NOC Application submitted by WestRock and additional technical analysis, Ecology finds the following. (Relevant findings from the initial NOC Order have been retained in this document for continuity.)

2018 FINDINGS

1. The previous 2007 NOC Approval order limited steam production at #6 Power Boiler to 782,000 Klbs/yr on a 12-month rolling total basis.
2. Due to the recent decline in natural gas prices, the economics now favor a higher utilization of the natural gas fueled #6 Power Boiler. Operating #6 Power Boiler at a higher rate will allow for increased flexibility for providing steam to the operations while allowing for increased power generation for sale by the facility.
3. The steam produced by #6 Power Boiler will be used for process steam which will allow for more steam produced from #7 Power Boiler and #4 Recovery Boiler to be used for power generation. The steam production limit restoration (from 782,000 to 1,517,829 Klbs/yr) at #6 Power Boiler will allow for increased flexibility for providing steam and will allow for

additional electrical power generation. Any increase in process steam production that is inconsistent with the NOC application may require additional analysis and modification of NOC Order No. 4153-AQ07.

4. The proposed modification would include the installation of four new dual fuel Natcom Cleaver-Brooks Low-NO_x Hyper mix burners to replace existing 1960's era conventional design burners. When firing natural gas, these burners will reduce the NO_x emissions rate from 0.27 lb/MMBtu to 0.14 lb/MMBtu.
5. WAC 173-400-111(8) allows for revisions to orders of approval provided that: 1) the change in conditions will not cause the source to exceed an emissions standard set by regulations or rule, 2) the change will not cause an exceedance of the ambient air quality standards, 3) the change will not adversely impact the ability of the permitting authority to determine compliance with an emissions standard, 4) the revised order will continue to require BACT for each new source approved by the order, and 5) the revised order meets the applicable NSR and PSD requirements.
6. #6 Power Boiler has the capability of firing fuel oil instead of natural gas. #6 Power Boiler has not fired fuel oil in the past 10 years. The firing of fuel oil is reserved for the event of natural gas curtailment or interruption. #6 Power Boiler is subject to 40 CFR Part 63, Subpart DDDDD (Boiler MACT). For Boiler MACT compliance, #6 Power Boiler is operated as boiler in the Gas 1 subcategory.
7. Any change in fuels fired which is inconsistent with the NOC modification application (dated August 10, 2018) shall be reanalyzed for compliance with applicable regulation and may require additional modification to NOC Order No. 4153-AQ07.
8. The proposed modification is to restore the steam production capacity of #6 Power Boiler to 1,517,829 Klbs/yr (12-month rolling average) from the previous limit of 782,000 Klbs/yr (12-month rolling average).
9. The previous steam production limit at #6 Power Boiler allows for the boiler to be operated at maximum steam capacity for periods of time as long as the 12-month rolling average steam limit (782,000 Klb/yr) can be met. For this reason, the restoration of the steam capacity (1,517,829 Klb/yr) will not increase short-term emission rates since short-term steam capacity was not previously limited.
10. The restoration of the steam capacity limit at #6 Power Boiler will not cause the source to exceed any emission standards set by regulation or rule. All applicable regulations and standards will remain in place.
11. The table below includes the potential emission increases associated with the increased use of the boiler. Toxic emission increases were estimated using EPA's emission factors for natural gas combustion in a boiler (EPA AP-42, Chapter 1.4). Emission factors with a rating of "average" or higher were used for estimating emissions.

Table 1. Emission increases from Power Boiler 6.

| Compound | Emission Increase |
|-------------------|--------------------------------|
| PM _{2.5} | 3.78 tons per year (TPY) |
| SO ₂ | 0.28 TPY |
| NO _x | 2.99 TPY |
| Lead | 0.125 pounds per year (lbs/yr) |
| Formaldehyde | 76.2 lbs/yr |
| Benzene | 2.1 lbs/yr |
| Toluene | 3.5 lb/yr |

12. No ambient air quality standards will be exceeded as a result of this change (see Table 3). Ambient air impacts were previously analyzed in 2007 as part of the Prevention of Significant Deterioration (PSD) analysis. This analysis did not include #6 Power Boiler but due to the proximity of the stack locations, the ambient air impact of the increase in emissions at #6 Power Boiler can be scaled to provide a screening level analysis. The ambient air quality analysis only looks at long-term ambient air quality impacts because there is no change in short-term emissions, as discussed in Finding 9 above.

Table 2. Emission ratios from 2007 PSD modeling results

| Compound | Emission Increase (TPY) | Ambient Impact ($\mu\text{g}/\text{m}^3$) | Ratio $\mu\text{g}/\text{m}^3$ to TPY |
|-------------------|-------------------------|---|---------------------------------------|
| PM _{2.5} | 44 | 0.24 | 0.0055 |
| SO ₂ | 15 | 0.09 | 0.006 |
| NO _x | 493 | 2.9 | 0.0059 |

The emissions ratios in Table 2 (last column) were applied to the emissions increase from the restoration of #6 Power Boiler's steam capacity to estimate the ambient air impact of the project (see Table 3).

Table 3. Predicted ambient air impacts based on emissions ratios from the 2007 PSD modeling results

| Compound | Emission Increase (TPY) ^a | Ratio $\mu\text{g}/\text{m}^3$ to TPY ^b | Ambient Air Quality Standard ($\mu\text{g}/\text{m}^3$) | WAC 173-400-113 Table 4a: Cause or Contribute Threshold Values ($\mu\text{g}/\text{m}^3$) | Predicted Ambient Impact ($\mu\text{g}/\text{m}^3$) |
|-------------------|--------------------------------------|--|---|---|---|
| PM _{2.5} | 3.78 | 0.0055 | 12.0 | 0.3 | 0.021 |
| SO ₂ | 0.28 | 0.006 | 53 | 1 | 0.002 |
| NO _x | 2.99 | 0.0059 | 101.3 | 1 | 0.08 |
| Lead | 6.23E-05 | 0.0055 | 0.15 | N/A | 3.43E-07 |

Footnotes:

- a. Ambient air quality standard for lead is a 3-month rolling average. The emissions increase for lead is the TPY increase divided by 4.
 - b. Emissions ratio for lead is assumed to be equivalent to the emissions ratio for PM_{2.5}.
13. The revised order will continue to require BACT. No change has been made to previous BACT determinations. #6 Power Boiler is not being modified, therefore, BACT does not apply to that unit at this time. However, Ecology acknowledges the use of the low-NO_x burners and the implementation of Boiler MACT are equivalent to the application of BACT for #6 Power Boiler.
 14. Power Boiler #6 is not being modified as part of this action under WAC 173-400-111(8), therefore new source review for toxics is not applicable. Toxic air emissions were quantified in Table 1.
 15. An environmental checklist was submitted with the NOC Application (Modification Request) which considered environmental impacts of the project as required by chapter 43.21C of the Revised Code of Washington (RCW), also known as the State Environmental Policy Act (SEPA). Ecology reviewed the checklist and made a Mitigated Determination of Nonsignificance (MDNS) signed on November 15, 2018 and made available for public comment at the same time as the order.
 16. The increase in the greenhouse gas (GHG) potential to emit (PTE) from the project is 60,605 ton per year above the baseline. The SEPA MDNS required mitigation of environmental impacts from the emissions of GHGs. Emissions of GHGs from steam production above a 1,142,000 Klbs/year (on a calendar year basis) action level at Power Boiler 6 must be mitigated using purchased certified GHG offsets or an alternative approved by Ecology.

Table 4. GHG emissions increase at #6 Power Boiler

| Scenario | Steam Rate (lb/hr) | Steam Rate (klbs/yr) | Natural Gas (MMBtu/yr) | CO ₂ (tons/yr) | CH ₄ (tons/yr) | N ₂ O (tons/yr) | CO ₂ e (tons/yr) | Increase from Baseline (tons/yr) |
|------------|--------------------|----------------------|------------------------|---------------------------|---------------------------|----------------------------|-----------------------------|----------------------------------|
| Baseline | 88,325 | 773,724 | 1,077,023 | 62,946 | 1.2 | 0.1 | 63,011 | 0 |
| Mitigation | 130,365 | 1,142,000 | 1,589,735 | 92,911 | 1.8 | 0.2 | 93,007 | 29,996 |
| PTE | 173,268 | 1,517,829 | 2,112,912 | 123,488 | 2.3 | 0.2 | 123,616 | 60,605 |

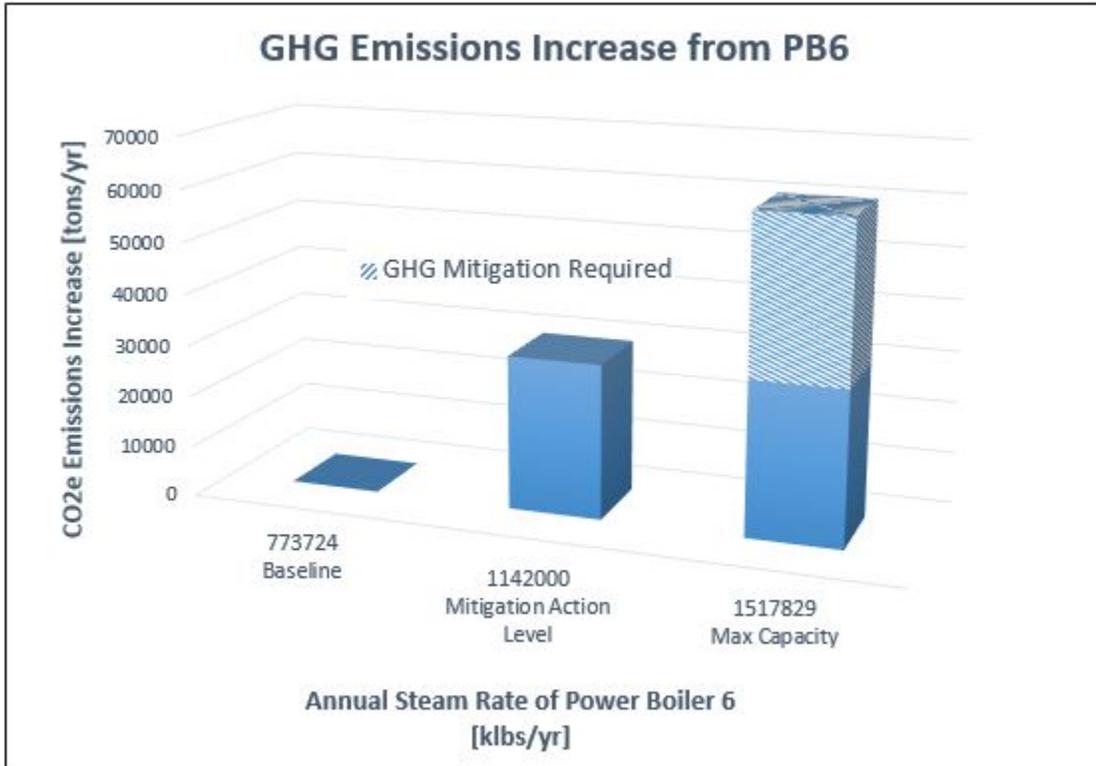


Figure 1. GHG emissions and mitigation action level

HISTORICAL 2007 FINDINGS

1. Simpson is proposing to install a steam turbine generator driven by steam produced from #4 Recovery Boiler and #7 Power Boiler at the pulp and paper mill in Tacoma, WA. The project will allow Simpson to cogenerate and distribute electrical power.
2. The proposed project consists of installation of:
 - a steam turbine and electrical generator rated at up to 60 MW,
 - power distribution and overload protection equipment,
 - a building to house the turbine/generator,
 - upgrades to the demineralizer system to produce the higher-quality boiler feedwater required for power generation,
 - a cooling tower to condense the turbine discharge steam that is not used in the process,
 - boiler improvements to produce the higher pressure and temperature steam required for power generation. These improvements will include adding tube area to #7 Power Boiler's superheater section, upgrading the pressure rating of #4 Recovery Boiler's generation bank, new pressure safety valves, and piping changes to handle higher pressure steam, and
 - upgrades to #7 PB to increase its Maximum Continuous Rated (MCR) steaming capacity from 300,000 pounds/hour (lb/hr) to 340,000 lb/hr. These will include

larger forced-draft and induced-draft fan motors, wood fuel feed system improvements, and possibly improvements to the ash handling, electrostatic precipitator and other ancillary systems.

3. Changes to #4 Recovery Boiler emissions are not expected due to the project. Unit emission limits and monitoring requirements in effect prior to this project will be continued.
4. Emission increases at #7 Power Boiler due to the project resulted in the need for a Prevention of Significant Deterioration (PSD) Permit for particulate matter less than 10 microns in diameter (PM₁₀), carbon monoxide (CO), and nitrogen oxides (NO_x) emission limits.
5. Maximum hourly sulfur dioxide (SO₂) emissions will not increase at #7 Power Boiler as a result of an enforceable limit. Thus, SO₂ emissions are not subject to state minor new source review (NSR). The enforceable limit is equal to the maximum potential to emit, in pounds per hour (lbs/hr), at boiler capacity prior to this project.
6. Maximum hourly volatile organic compound (VOC) emissions will not increase at #7 Power Boiler as a result of an enforceable limit. Thus, VOC emissions are not subject to state minor new source review (NSR). The enforceable limit is equal to the maximum potential to emit, in pounds per hour (lbs/hr), at boiler capacity prior to this project.
7. Opacity levels at #7 Power Boiler are not expected to change as a result of this project. The opacity limit and monitoring requirements in effect prior to this project will be continued.
8. Air toxics, per WAC 173-460 were addressed in the application. The maximum predicted toxic pollutant concentrations were less than acceptable source impact levels (ASILs) for the toxic air pollutants emitted. No limits are necessary.
9. Use of #6 Power Boiler is not expected to increase. A limit capping steam production from the unit to the maximum annual amount produced during the past ten years is included in this Order.
10. The application included calculations to demonstrate the project will not trigger applicability of federal Acid Rain regulations (40 CFR §72.6).
11. The application resulted in issuance of PSD permit No. 06-02 and this Order. Together the PSD and Order limit emissions from #7 Power Boiler. Therefore, upon Ecology receipt of written notice of project completion:
 - this Order along with PSD permit No. 06-02 supersedes conditions for particulate, opacity, NO_x, SO₂, CO, and VOC specified for #7 Power Boiler in Order No.97AQI004, and
 - conditions in Order No.97AQI004 for particulate, opacity, NO_x, SO₂, CO, and VOC at #7 Power Boiler are rescinded.
12. A State Environmental Policy Act (SEPA) review was conducted by the City of Tacoma Public Works Department. A Mitigated Determination of Non-Significance (MDNS) was issued on April 12, 2007.

Therefore, it is ordered that the project, as described in said Notice of Construction Application, the subsequent modification request, and in additional information submitted to the Department

of Ecology on reference thereto, is approved for construction, installation and operation, provided the following conditions are met.

CONDITIONS:

1. The Permittee shall comply with Appendix A of this Order.
2. Greenhouse Gas Mitigation Action Level [State Only Requirement]: Emissions of GHGs from steam production above a 1,142,000 Klbs/year (on a calendar year basis) action level at Power Boiler 6 must be mitigated using purchased certified GHG offsets or an alternative approved by Ecology. To demonstrate compliance with this requirement, the following must be met:
 - a. Monitor annual steam production total for each calendar year. Calendar year is defined as the period from January 1st through December 31st.
 - b. Annual steam production above the 1,142,000 Klbs/year action level requires GHG mitigation for each ton of GHG produced above the action level.
 - c. GHG emissions produced above the steam production action level shall be mitigated through the purchase of Ecology approved GHG offsets or other GHG mitigation methods approved by Ecology.
 - d. Records of GHG emission offset purchases must be maintained onsite for a minimum of five (5) years in a form suitable for expeditious review.
3. The Permittee shall notify Ecology in writing within 30 days of installation of the low NOx burners for #6 Power Boiler. The new steam limit for #6 Power Boiler will go into effect upon submission of the notification.
4. Operating and maintenance manuals for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Copies of the manuals shall be available to the department. Emissions that result from a failure to follow the requirements of the manuals may be considered proof that the equipment was not properly operated and maintained.
5. Access to the source by the U.S. Environmental Protection Agency (EPA) or Department of Ecology personnel shall be permitted upon request and presentation of proper credentials for the purpose of compliance assurance inspections. Failure to allow access is grounds for revocation of this determination of approval.
6. At all times, including periods of startup, shutdown, and upset, the Permittee shall, to the extent practicable, maintain and operate all equipment that is capable of contributing to air pollution in a manner consistent with good air pollution control practice for minimizing emissions. During periods of upset the permittee shall take immediate and appropriate corrective action to minimize emissions, including slowing or shutting down the emission unit.
7. Ecology may modify conditions contained herein, pursuant to legal requirements, based on air quality, emissions monitoring results, or upon the request of the Permittee.

Nothing in this order shall be construed as obviating compliance with any requirement of law other than those imposed pursuant to the Washington Clean Air Act and rules and regulations thereunder.

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

Authorization may be modified, suspended or revoked in whole or part for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this authorization.
2. Obtaining this authorization by misrepresentation or failure to disclose fully all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization, or application of any provision of this authorization to any circumstance, is held invalid, the application of such provision to their circumstances and the remainder of this authorization, shall not be affected thereby.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

| Street Addresses | Mailing Addresses |
|--|---|
| Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 | Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 |
| Pollution Control Hearings Board 1111 Israel Road SW STE 301 Tumwater, WA 98501 | Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903 |

MORE INFORMATION

- **Pollution Control Hearings Board**
www.eho.wa.gov/Boards_PCHB.aspx
- **Chapter 43.21B RCW, Environmental Hearings Office – Pollution Control Hearings Board**
<http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B>
- **Chapter 371-08 WAC – Practice and Procedure**
<http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08>
- **Chapter 34.05 RCW – Administrative Procedure Act**
<http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05>
- **Chapter 70.94 RCW, Washington Clean Air Act**
<http://apps.leg.wa.gov/RCW/default.aspx?cite=70.94>
- **Air Quality Rules**
<https://ecology.wa.gov/Air-Climate/Air-quality/Business-industry-requirements/Permits-for-burning-industrial>

SIGNATURES

Reviewed by:

Signature Authority:

Shingo Yamazaki, P.E.
Environmental Engineer
Solid Waste Management Program

James DeMay, P.E.
Industrial Section Manager
Solid Waste Management Program

Date

Date

APPENDIX A

The emission limits shall be monitored at the monitoring frequency and with the compliance test methods specified. Averages over the time specified in emission limits shall be determined by the arithmetic mean of measurements taken during the specified time period. Results of test runs found to be invalid shall be eliminated and results of the remaining valid test runs shall be used to find the arithmetic mean and determine compliance.

A. Power Boiler #7 requirements are:

| | Parameter | Limit (shall not exceed) | Monitoring & Reporting |
|----|--|--|--|
| 1. | Opacity | 10% average for more than 6 consecutive minutes in any 60 minute period. | DOE Test Method 9B is the reference test method. Monitor continuously using an approved continuous opacity monitoring system (COMS) that conforms to 40 CFR Pt. 60, App. B, Perf. Spec. 1. Report daily maximum 6-minute opacity averages and exceedances monthly. |
| 2. | SO ₂ | 220 lbs/hr – 1 hour average. | Continuously monitor and log fuel use. Calculate the SO ₂ emission rate using methods of calculation specified in Footnote A1. Report daily maximum 1 hour averages, monthly maximum 1 hour average, and exceedances monthly. |
| | | 383 TPY – 12 month rolling total. | Report monthly total and 12 month rolling total monthly. |
| | | fuel oil ≤2% sulfur by weight. | Collect a well-mixed sample from fuel oil tank(s) monthly. Use ASTM Method D129-64, D1552-83, D4057-81, or equivalent to determine %S content. Report result monthly. |
| | | 10% annual capacity factor from oil. | Fuel mass balance. Maintain records of fuel usage. Calculate and report annual oil capacity factor monthly |
| 3. | VOC | 0.13 lbs/MMBTU. | Source test twice per year using EPA Method 25A or equivalent. Use the average of 3 one-hour runs. Report results on most immediate monthly report. |
| 4. | Operate a continuous emission monitor for O ₂ that conforms to 40 CFR Pt. 60 Appendix F and Appendix B, Performance Specification 3. | | |
| 5. | The permittee may not fire Power Boiler #7 with hogged fuel while both sides of the precipitator are out of service; however, it may fire oil or natural gas subject to all applicable air emission limits. The permittee shall monitor and record the time and duration when both sides of the precipitator are out of service at the same time, and maintain facility operation records showing that the firing limitation was followed. All violations will be reported in the most immediate monthly report. | | |

Footnotes:

- A1. SO₂ calculation methods:
 For wood: $SO_2 \text{ (lbs/hr)} = \text{BDT/hr (wood)} \times 0.080 \text{ lb } SO_2/\text{BDT}$
 For natural gas: $SO_2 \text{ (lbs/hr)} = 1000 \text{ ft}^3/\text{hr (gas)} \times 0.003 \text{ lb } SO_2/1000 \text{ ft}^3$
 For sludge: $SO_2 \text{ (lbs/hr)} = \text{BDT/hr (sludge)} \times 22.8 \text{ lb } SO_2/\text{BDT}$
 For oil: $SO_2 \text{ (lbs/hr)} = [\text{gal/hr (oil)} \times \text{density of oil (lbs/gal)}] \times [\% \text{ S in oil}^* \div 100] \times 2 \text{ (lb } SO_2/\text{lb S)}$
 For residual fuel oil density = 7.9 lbs/gal
 For reprocessed fuel oil (RFO) density = 7.4 lbs/gal
 Total SO₂ (lbs/hr) = sum from all fuel sources.
- * use most recent result of fuel oil tank(s) %S test in calculation.

B. Power Boiler #6 requirements are:

| | Parameter | Limit (shall not exceed) | Monitoring & Reporting |
|----|------------------|---|--|
| 1. | Steam Production | 1,517,829 Klbs/yr – 12 month rolling total. | Monitor steam production. Report monthly production and 12-month rolling total monthly. |
| 2. | Fuel Oil Firing | N/A | Report total fuel oil fired monthly. Any change in fuels fired which is inconsistent with the NOC modification application (dated August 10, 2018) shall be reanalyzed for compliance with applicable regulation and may require a modification to NOC Order No. 4153-AQ07. |