**RICE MACT: Operations and Maintenance (O&M) Plan**

The purpose of this O&M Plan is to document the means by which the Weyerhaeuser Grayling OSB facility manages the site’s stationary diesel-powered engine and emergency engines as demonstrated by way of the following operating practices and maintenance procedures.

Operations

* Limit the engine’s time spent at idle during start-up and the engine’s start-up time to less than 30 minutes.
* Document the annual engine hours of operation and the purpose of use for each hour operated (i.e., maintenance checks and readiness testing, conditional non-emergency use). Note that there is no time limit on the use of the engine in emergency situations.
* Comply with all applicable CI RICE MACT requirements for Title V permit certification purposes.

Documentation of Hours

* A non-resettable hour meter is installed on each on-site stationary RICE
* Hour meter readings are recorded in the log sheet for each RICE unit every time the engine is shut down after use and at the beginning of each month. Reasons for engine run time are recorded at the same time. The diesel logs are collected quarterly and digital copies are kept in: [S:\Environmental\Section 3 Air\500 Reports\Air quality Reports\Air Emissions\Diesel Logs](file:///S:\Environmental\Section%203%20Air\500%20Reports\Air%20Quality%20Reports\AirEmissions\Diesel%20Logs)
* Compiled yearly hours for each RICE unit with reasons for use are recorded in: [S:\Environmental\Section 3 Air\500 Reports\Air Quality Reports\AirEmissions\Airsum](file:///S:\Environmental\Section%203%20Air\500%20Reports\Air%20Quality%20Reports\AirEmissions\Airsum)

Maintenance

* Assuming the engine operates less than 500 hours/year; change the oil and filter annually, inspect the air cleaner and all hoses and belts annually and replace as necessary. Document each of these annual activities. If the engine operates more than 500 hours during the year then change the oil and filter every 500 hours.
* Limit the maintenance checks and readiness testing of the engine to less than 100 hours per year (not more than 50 of these hours can be dedicated to conditional non-emergency use).
* Keep records of the maintenance conducted on the engine in order to demonstrate that it is being operated and maintained according to the plant’s maintenance plan (i.e., preventative maintenance system).
* Conform to all applicable instructions in the Operation and Maintenance Manuals. [Copies of these manuals are kept at the Grayling facility.](file:///S:\Environmental\Section%203%20Air\300%20Plans\RICE%20MACT\Diesel%20Engine%20Manuals)
* Immediately report any failure to perform, on the schedule required, the changing of the oil and the filter and inspection of the air cleaner and the hoses and the belts.

Documentation of Maintenance

* Preventative Maintenance (repetitive) preventive maintenance plans are identified by SAP system number and listed with the information for each RICE unit in this document.

**Detroit Diesel Emergency Fire Pump Engine/EUFIREPUMP**

40 CFR Part 63, Subpart ZZZZ (RICE MACT)

Maintenance Procedures

Two-week Test Start, Fluid Check, and Inspection: PM# 1093045

Annual Service & Inspection: PM# 1113251  
Two Year Battery Replacement: PM# 1111774

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:** | Detroit Diesel Emergency Fire Pump | | | |
| **Mfg./Install Date:** | Feb 1981 | **Air/Fuel Ratio:** | 32.24 | |
| **Serial No.:** | 6A0414479 | **HP:** | 281 | |
| **Model No.:** | 6-71 Detroit Diesel | **Injector:** | N95 | |
| **Fuel Consumption:** | 17.11 GPH at 100% rated load, NA for 50% rated load | | | |
|  | .376 lb./hp/hr. at 2600 RPM | | | |
| **Displacement:** | 426 cubic inches | | | |
| **Exhaust:** | GoogleEarth Coordinates: 44°35’35”N, 84°41’40”W  6 1/2" opening directed at the ground (angled downward at 45 degree) 880 feet west of "21" 55' south of "K" (noted in Tom Mosher's notes from 1994 permit documentation in archives- site plan coordinates K and 21) | | | |
| **Exhaust Temp:** | 780° F | **Cylinders:** | 6 |  |
| **Exhaust Flow:** | 2090 CFM | **No. of Cycles:** | 2 T |  |
| **Emission Data:** | **Gm/hr.** | **Gm/bhp/hr.** | **Lb/hr** | **PPM** |
| **HC** | 74.05 | 0.23 | 0.16 | 85 |
| **NOx** | 3624.06 | 11.4 | 7.99 | 1266 |
| **CO** | 4896.3 | 15.4 | 10.79 | 2810 |
| **CO2** | 181894.1 | 571.99 | 401 | 66429.67 |
| **SO2** | 542.51 | 7.71 | 1.2 | 136.21 |
| **PM** | 184.44 | 0.58 | 0.41 |  |

**Cummins Diesel Powered Emergency Hot Oil Circulating Pump Engine/EUDIESELHOTOIL**

40 CFR Part 63, Subpart ZZZZ (RICE MACT)

Maintenance Procedures

Two-week Test Start: PM# 1115267

Two-week Fluid Check and Inspection: PM# 1112855

Annual Service & Inspection: PM# 1094213

Two-year Battery Replacement: PM# 1111773

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:** | Cummins Emergency Diesel Hot Oil Pump | | |
| **Mfg./Install Date:** | Mfg. 2/12/2002  Install: 7/6/2006 | **Air/Fuel Ratio:** | No information |
| **Serial No.:** | 68009179 | **HP/kW:** | 85/63 |
| **Model No.:** | Cummins Diesel B3.3 | **Injector:** | Bosch-Zexel VE direct injection. C6205113101 |
| **Fuel Consumption:** | .345 lb./hp/hr. at 1400 RPM | | |
|  | .376 lb./hp/hr. at 2600 RPM | | |
| **Displacement** | 3.3L (199 cu. In.) | | |
| **Exhaust:** | GoogleEarth Coordinates: 44°35’30”N, 84°41’23”W  Vertically through a 3 1/2" opening covered with counter balanced rain cap 12' above grade and 1 1/2' from outside wall, 290’ east of “21” 495 south of “K” (noted in Tom Mosher's notes from 1994 permit documentation in archives- site plan coordinates K and 21) | | |
| **Exhaust Temp:** | 970° F | **Cylinders:** | 4 |
| **Exhaust Flow:** | 475 CFM | **No. of Cycles:** | In line 4 cycle |
| **Emission Data:** | **Gal./bhp/hr** |  |  |
| **HC** | **0.8** |  |  |
| **CO** | **4.0** |  |  |
| **NOx** | **6.2** |  |  |
| **PM** | **0.5** |  |  |

**Caterpillar Emergency Stand-by Diesel Generator/EUEMERGENCYGEN**

40 CFR Part 63, Subpart ZZZZ (RICE MACT)

Maintenance Procedures

Two-week Test Start, Fluid Check, and Inspection: PM# 1115267

Annual Service/Inspection: PM# 1112833

Two-year Battery Replacement: PM# 1115133 *Can be 3-year per manual*

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:** | Caterpillar Emergency Stand-by Diesel Generator | | |
| **Mfg./Install Date:** | ~ 1981 install | **Air/Fuel Ratio:** | No information |
| **Serial No.:** | 85Z03713 2W1742 | **HP/kW:** | 306/228 |
| **Model No.:** | 3306B Caterpillar | **Injector:** |  |
| **Fuel Consumption:** | 19.2 gal./hr. at 100% rated load | | |
|  | 10.0 gal./hr. at 54% load | | |
| **Displacement:** |  | | |
| **Exhaust:** | GoogleEarth Coordinates: 44°35’30”N, 84°41’23”W  Vertically through a 6" opening covered with counter balanced rain cap 10' above grade and 1 1/2' from outside wall. 295 feet east of "21" 495 south of "K" (noted in Tom Mosher's notes from 1994 permit documentation in archives- site plan coordinates K and 21) | | |
| **Exhaust Temp:** |  | **Cylinders:** | 6 |
| **Exhaust Flow:** |  | **No. of Cycles:** |  |
| **Emission Data:** |  |  |  |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
|  |  |  |

**Cummins Diesel Powered Air Compressor Engine/EUCOMPRESSOR**This Cummins diesel engine provides power for a portable D900-HAF Sullivan and Palatek air compressor. The air compressor’s primary purpose is to provide back-up to the mill’s compressed air system.

NSPS, Subpart IIII, 40 CFR 89.112 (emission certification)

Maintenance Procedures

PMS (250 hour or 3 months, 500 hour or 6 months, 1000 hour or 1 year, 2000 hours or 2 years)

Weekly Test Start, Fluid Check, and Inspection: PM# 112748

Biennial and Annual Service & Inspection: PM# 1117617

Two-year Battery Replacement: PM# 1115134 (not listed in the engine manual)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:** | Cummins Diesel Powered Air Compressor Engine | | |
| **Mfg./Install Date:** | 9/26/2014/ | **Air/Fuel Ratio:** |  |
| **Serial No.:** | 73745288 | **HP/BTU:** | 305 HP/776,225 BTU/227.4 kw |
| **Model No.:** | QSC 8.3 (Tier 3) | **Injector:** | ECM |
| **Fuel Consumption:** | 167 mm3/stroke, #2 diesel at < 5% sulfur content | | |
|  | 10.06 gph @ 1900 RPM (max load) | | |
|  | 7.41 gph @ 1400 RPM (idle) | | |
| **Exhaust:** | GoogleEarth Coordinates: 44°35’32”N, 84°41’21”W  Turbo exhausts vertically through a 3 1/2" opening covered with counter balanced rain cap 7’ above ground. | | |
| **Exhaust Temp:** | 900° F | **Cylinders:** | 6 |
| **Exhaust Flow:** | 2097 CFM | **No. of Cycles:** | 4 |
| **Emission Data:** | **FEL EPA**  **G/KW-h** | **Displacement:** | 8.3 liter (506 in3 total displacement) |
| **CO** | 3.5 |  |  |
| **NMHC** | 0.19 |  |  |
| **NOx** | 0.40 | Mfg. certified below FEL | |
| **PM** | 0.02 | Mfg. certified below FEL | |

**Generac Emergency Generator/EUGENERAC**

NSPS, Subpart JJJJ (For Gasoline/**Propane**/LPG fueled units)

Maintenance Procedures

PM 1147983 1-year PM completed per operating manual

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:** | Generac Emergency Stand-by Generator (2 cylinder) – Gate House | | |
| **Mfg./Install Date:** | 5/16/17 \*\*\* | **Air/Fuel Ratio:** |  |
| **Serial No.:** | 3001637995 (Unit)  3001644197 (Engine) | **HP/kW:** | 29.5/22 |
| **Model No.:** | G0070420 | **Injector:** |  |
| **Fuel Consumption:** | 3.6 gal./hr. at 100% rated load | | |
|  | 2.1 gal./hr. at 50% rated load | | |
| **Displacement:** | 2.4L | | |
| **Exhaust:** | GoogleEarth Coordinates: 44°35’41”N, 84°41’36”W | | |
| **Exhaust Temp:** | 482C/900F | **Cylinders:** | 2 |
| **Exhaust Flow:** | 165 CFM | **No. of Cycles:** | 4 |
| **Emission Data:** | Emission Warranty |  |  |
|  |  |  |  |
|  |  |  |  |

*\*\*\* Mfg./Install Date: Project complete date in PACE*

**Record of Revisions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Revision Date** | **Description** | **Sections Affected** | **Revised By:** |  |
| 3/24/2020 | Added GoogleMap Coordinates for engines and updated Generac Info | All | Kathi Moss |  |
| 11/11/19 | Added Permit (EU) Emission Unit Names to engines | Engine Descriptions | Kathi Moss |  |
| 4/5/2019 | Updated to include mfg/install year, added tables, compressor description, & changed PM numbers | All | Kathi Moss |  |
| 8/18/2015 | Added Cummins air compressor diesel | Engine descriptions | Faith Dandois |  |
| 5/7/2014 | Updated info on Cummins and Caterpillar | Engine descriptions | Faith Dandois |  |
| 8/9/2013 | Revised for SAP conversion | PM numbers | Faith Dandois |  |
| 5/23/2013 | Created | All | Faith Dandois |  |