

State of Oregon

Department of Environmental Quality

Memorandum

Date: 1/15/2021

To: File/Kenzie Billings
From: Thomas Rhodes

Subject: Source Test Review Report
Oil Re-Refining Company
Permit Number: 18-0020

Test Dates: August 25-26, 2020
Report Received: November 20, 2020
Source Tester: Environmental Technical Services
DEQ Observed: Yes

I) Source Description: Used oil reprocessing facility.

II) Process (es)/Emissions Unit(s) Tested: Auxiliary boiler fired with 100% waste oil distillate.

III) Test Purpose: Compliance with Cleaner Air Oregon request dated March 17, 2020 for source testing to develop emission factors for air toxics.

IV) Testing Location:

Boiler Exhaust:

Diameter:	29"
Distance A (Method 1):	348" (12.0 Diameters)
Distance B (Method 1):	60" (2.1 Diameters)
Number traverse points utilized:	20

V) Testing Methodology: The following testing methods were utilized during the testing program:

Flow Rate, O₂ & CO₂, & Moisture Content: EPA Methods 1, 2, 3A & 4
Metals: EPA Method 29
Dioxins & Furans: EPA Method 23
PAHs: EPA Method 23
PCBs: EPA Method 23

VI) Summary of Results: The testing parameters, test results and operating parameters are summarized in the Tables below:

Table 1: Multi-metals
Table 2: Dioxins & Furans
Table 3: PAHs
Table 4: PCBs

TABLE 1: Metals

Testing Parameters	Run 1	Run 2	Run 3	Average
Exhaust Gas Temperature (°F)	461	461	475	466
Exhaust Gas Moisture (%)	8.0	8.0	8.1	8.0
Exhaust O2 (% dry vol)	11.6	11.6	10.4	11.2
Exhaust CO2 (% dry vol)	6.7	6.6	7.5	7.0
Exhaust Gas Flow Rate (dscf/m)	671	713	651	678
Sample Volume (dscf)	114.422	135.377	123.931	124.577
Aluminum Al Emissions:				
· lb/hr	1.02E-04	1.02E-04	9.25E-05	9.88E-05
· lb/Mgal	6.85E-03	6.69E-03	6.21E-03	6.58E-03
Antimony Sb Emissions:				
· lb/hr	< 1.73E-06	< 1.24E-06	< 1.24E-06	< 1.41E-06
· lb/Mgal	< 1.16E-04	< 8.18E-05	< 8.33E-05	< 9.37E-05
Arsenic As Emissions:				
· lb/hr	< 1.97E-06	< 1.74E-06	< 1.74E-06	< 1.82E-06 ^a
· lb/Mgal	< 1.32E-04	< 1.15E-04	< 1.17E-04	< 1.21E-04 ^a
Beryllium Be Emissions:				
· lb/hr	< 5.65E-08	< 5.00E-08	< 4.99E-08	< 5.22E-08 ^a
· lb/Mgal	< 3.78E-06	< 3.29E-06	< 3.35E-06	< 3.47E-06 ^a
Cadmium Cd Emissions:				
· lb/hr	< 1.03E-07	< 5.23E-07	< 1.45E-07	< 2.57E-07
· lb/Mgal	< 6.89E-06	< 3.44E-05	< 9.73E-06	< 1.70E-05
Chromium Cr Emissions:				
· lb/hr	1.76E-06 ^b	1.52E-05	1.49E-06 ^b	6.15E-06
· lb/Mgal	1.18E-04 ^b	9.99E-04	1.00E-04 ^b	4.06E-04
Cobalt Co Emissions:				
· lb/hr	< 1.40E-07	< 1.24E-07	< 1.24E-07	< 1.30E-07 ^a
· lb/Mgal	< 9.37E-06	< 8.18E-06	< 8.33E-06	< 8.63E-06 ^a
Copper Cu Emissions:				
· lb/hr	1.02E-05	7.91E-06	7.74E-06	8.62E-06
· lb/Mgal	6.82E-04	5.21E-04	5.20E-04	5.74E-04
Lead Pb Emissions:				
· lb/hr	< 3.84E-05	< 3.87E-05	< 3.73E-05	< 3.81E-05
· lb/Mgal	< 2.57E-03	< 2.55E-03	< 2.50E-03	< 2.54E-03
Manganese Mn Emissions:				
· lb/hr	4.26E-06	5.29E-06	3.94E-06	4.50E-06
· lb/Mgal	2.85E-04	3.48E-04	2.64E-04	2.99E-04
Mercury Hg Emissions:				
· lb/hr	< 3.48E-07	< 3.42E-07	< 3.19E-07	< 3.36E-07
· lb/Mgal	< 2.33E-05	< 2.25E-05	< 2.14E-05	< 2.24E-05

‘<’ denotes results calculated using the MDL for front half and/or back half results that were non-detect.

^a All sample fractions were below the MDL

^b No blank correction was done since blank correcting would have yielded a negative result

TABLE 1 Continued: Metals

Testing Parameters	Run 1	Run 2	Run 3	Average
Nickel Ni Emissions:				
· lb/hr	1.72E-06 ^b	6.53E-07	5.67E-07	9.79E-07
· lb/Mgal	1.15E-04 ^b	4.30E-05	3.80E-05	6.53E-05
Phosphorus P Emissions:				
· lb/hr	4.33E-04	4.17E-04	4.13E-04	4.21E-04
· lb/Mgal	2.90E-02	2.75E-02	2.77E-02	2.81E-02
Selenium Se Emissions:				
· lb/hr	< 4.22E-06	< 3.73E-06 ^a	< 4.05E-06	< 4.00E-06
· lb/Mgal	< 2.82E-04	< 2.46E-04 ^a	< 2.72E-04	< 2.66E-04
Vanadium V Emissions:				
· lb/hr	< 2.81E-07	< 2.49E-07	< 2.48E-07	< 2.59E-07 ^a
· lb/Mgal	< 1.88E-05	< 1.64E-05	< 1.67E-05	< 1.73E-05 ^a
Zinc Zn Emissions:				
· lb/hr	4.70E-05	4.16E-05	4.05E-05	4.30E-05
· lb/Mgal	3.14E-03	2.74E-03	2.72E-03	2.87E-03

‘<’ denotes results calculated using the MDL for front half and/or back half results that were non-detect.

^a All sample fractions were below the MDL

^b No blank correction was done since blank correcting would have yielded a negative result

TABLE 2: Dioxins & Furans

Testing Parameters	Run 1	Run 2	Run 3	Average
Exhaust Gas Temperature (°F)	444	451	451	449
Exhaust Gas Moisture (%)	8.0	8.2	8.3	8.2
Exhaust Gas Flow Rate (dscf/m)	671	684	662	672
Sample Volume (dscf)	117.659	133.611	129.469	126.913
2,3,7,8-TCDD Emissions:				
· lb/hr	< 1.99E-12	< 3.14E-12	< 1.23E-12	< 2.12E-12
· lb/1000 gal	< 1.33E-10	< 2.06E-10	< 8.25E-11	< 1.41E-10
· lb TEQ/1000 gal	< 1.33E-10	< 2.06E-10	< 8.25E-11	< 1.41E-10
1,2,3,7,8-PeCDD Emissions:				
· lb/hr	2.00E-11	1.57E-11	1.63E-11	1.74E-11
· lb/1000 gal	1.34E-09	1.04E-09	1.10E-09	1.16E-09
· lb TEQ/1000 gal	1.34E-09	1.04E-09	1.10E-09	1.16E-09
1,2,3,4,7,8-HxCDD Emissions:				
· lb/hr	< 1.60E-11	1.85E-11	2.52E-11	< 1.99E-11
· lb/1000 gal	< 1.07E-09	1.22E-09	1.69E-09	< 1.33E-09
· lb TEQ/1000 gal	< 1.07E-10	1.22E-10	1.69E-10	< 1.33E-10
1,2,3,6,7,8-HxCDD Emissions:				
· lb/hr	4.83E-11	6.30E-11	7.70E-11	6.28E-11
· lb/1000 gal	3.23E-09	4.15E-09	5.16E-09	4.18E-09
· lb TEQ/1000 gal	3.23E-10	4.15E-10	5.16E-10	4.18E-10
1,2,3,7,8,9 HxCDD Emissions:				
· lb/hr	2.56E-11	3.24E-12	4.01E-11	2.30E-11
· lb/1000 gal	1.71E-09	2.13E-10	2.69E-09	1.54E-09
· lb TEQ/1000 gal	1.71E-10	2.13E-11	2.69E-10	1.54E-10
1,2,3,4,6,7,8-HpCDD Emissions:				
· lb/hr	2.97E-10	4.16E-10	4.75E-10	3.96E-10
· lb/1000 gal	1.99E-08	2.73E-08	3.18E-08	2.64E-08
· lb TEQ/1000 gal	1.99E-10	2.73E-10	3.18E-10	2.64E-10
OCDD Emissions:				
· lb/hr	3.03E-10	4.47E-10	5.83E-10	4.45E-10
· lb/1000 gal	2.03E-08	2.94E-08	3.91E-08	2.96E-08
· lb TEQ/1000 gal	6.09E-12	8.83E-12	1.17E-11	8.89E-12
2,3,7,8-TCDF Emissions:				
· lb/hr	4.33E-11	1.45E-11	1.63E-11	2.47E-11
· lb/1000 gal	2.90E-09	9.51E-10	1.09E-09	1.65E-09
· lb TEQ/1000 gal	2.90E-10	9.51E-11	1.09E-10	1.65E-10
1,2,3,7,8-PeCDF Emissions:				
· lb/hr	2.98E-11	< 1.35E-11	1.78E-11	< 2.04E-11
· lb/1000 gal	1.99E-09	< 8.89E-10	1.19E-09	< 1.36E-09
· lb TEQ/1000 gal	5.98E-11	< 2.67E-11	3.57E-11	< 4.07E-11

'<' denotes results calculated using the EDL or EMPC for results that were non-detect

TABLE 2 Continued: Dioxins & Furans

Testing Parameters	Run 1	Run 2	Run 3	Average
2,3,4,7,8-PeCDF Emissions:				
· lb/hr	5.25E-11	3.01E-11	3.49E-11	3.92E-11
· lb/1000 gal	3.51E-09	1.98E-09	2.34E-09	2.61E-09
· lb TEQ/1000 gal	1.05E-09	5.95E-10	7.03E-10	7.83E-10
1,2,3,4,7,8-HxCDF Emissions:				
· lb/hr	2.36E-11	2.45E-11	3.00E-11	2.60E-11
· lb/1000 gal	1.58E-09	1.61E-09	2.02E-09	1.74E-09
· lb TEQ/1000 gal	1.58E-10	1.61E-10	2.02E-10	1.74E-10
1,2,3,6,7,8-HxCDF Emissions:				
· lb/hr	2.58E-11	2.38E-11	2.88E-11	2.61E-11
· lb/1000 gal	1.73E-09	1.56E-09	1.93E-09	1.74E-09
· lb TEQ/1000 gal	1.73E-10	1.56E-10	1.93E-10	1.74E-10
2,3,4,6,7,8-HxCDF Emissions:				
· lb/hr	2.71E-11	2.57E-11	3.15E-11	2.81E-11
· lb/1000 gal	1.81E-09	1.69E-09	2.12E-09	1.87E-09
· lb TEQ/1000 gal	1.81E-10	1.69E-10	2.12E-10	1.87E-10
1,2,3,7,8,9 HxCDF Emissions:				
· lb/hr	2.12E-12	7.10E-12	< 3.85E-12	< 4.36E-12
· lb/1000 gal	1.42E-10	4.67E-10	< 2.58E-10	< 2.89E-10
· lb TEQ/1000 gal	1.42E-11	4.67E-11	< 2.58E-11	< 2.89E-11
1,2,3,4,6,7,8-HpCDF Emissions:				
· lb/hr	5.08E-11	6.05E-11	7.16E-11	6.10E-11
· lb/1000 gal	3.40E-09	3.98E-09	4.80E-09	4.06E-09
· lb TEQ/1000 gal	3.40E-11	3.98E-11	4.80E-11	4.06E-11
1,2,3,4,7,8,9-HpCDF Emissions:				
· lb/hr	< 5.94E-12	9.53E-12	< 1.09E-11	< 8.78E-12
· lb/1000 gal	< 3.97E-10	6.27E-10	< 7.29E-10	< 5.85E-10
· lb TEQ/1000 gal	< 3.97E-12	6.27E-12	< 7.29E-12	< 5.85E-12
OCDF Emissions:				
· lb/hr	1.54E-11	2.16E-11	2.48E-11	2.06E-11
· lb/1000 gal	1.03E-09	1.42E-09	1.67E-09	1.37E-09
· lb TEQ/1000 gal	3.08E-13	4.25E-13	5.00E-13	4.11E-13
D/F Total Emissions:				
· lb/1000 gal	< 6.62E-08	< 7.88E-08	< 9.99E-08	< 8.16E-08
· lb/1000 gal TEQ	< 4.25E-09	< 3.38E-09	< 4.00E-09	< 3.87E-09

'<' denotes results calculated using the EDL or EMPC for results that were non-detect

TABLE 3: PAHs

Testing Parameters	Run 1	Run 2	Run 3	Average
Acenaphthene Emissions:				
· lb/hr	4.08E-09	2.49E-09	3.86E-09	3.48E-09
· lb/Mgal	2.73E-07	1.64E-07	2.59E-07	2.32E-07
Acenaphthylene Emissions:				
· lb/hr	2.56E-09	2.98E-09	2.35E-09	2.63E-09
· lb/Mgal	1.71E-07	1.96E-07	1.58E-07	1.75E-07
Anthracene Emissions:				
· lb/hr	< 3.91E-09	< 3.51E-09	< 3.51E-09	< 3.64E-09
· lb/Mgal	< 2.62E-07	< 2.31E-07	< 2.35E-07	< 2.43E-07
Benz[a]anthracene Emissions:				
· lb/hr	< 1.51E-09	< 1.35E-09	< 1.35E-09	< 1.40E-09
· lb/Mgal	< 1.01E-07	< 8.89E-08	< 9.06E-08	< 9.34E-08
Benzo[a]pyrene Emissions:				
· lb/hr	1.99E-09	7.16E-09	1.69E-09	3.62E-09
· lb/Mgal	1.33E-07	4.71E-07	1.14E-07	2.39E-07
Benzo[b]fluoranthene Emissions:				
· lb/hr	4.53E-09	5.54E-09	1.92E-08	9.77E-09
· lb/Mgal	3.03E-07	3.65E-07	1.29E-06	6.53E-07
Benzo[e]pyrene Emissions:				
· lb/hr	9.71E-09	3.20E-08	1.52E-08	1.90E-08
· lb/Mgal	6.49E-07	2.11E-06	1.02E-06	1.26E-06
Benzo[g,h,i]perylene Emissions:				
· lb/hr	3.68E-08	1.95E-07	2.89E-08	8.67E-08
· lb/Mgal	2.46E-06	1.28E-05	1.94E-06	5.73E-06
Benzo[k]fluoranthene Emissions:				
· lb/hr	1.78E-09	1.83E-09	7.62E-09	3.74E-09
· lb/Mgal	1.19E-07	1.20E-07	5.12E-07	2.50E-07
Chrysene Emissions:				
· lb/hr	5.15E-09	4.09E-09	1.05E-08	6.57E-09
· lb/Mgal	3.44E-07	2.69E-07	7.02E-07	4.38E-07
Dibenz[a,h]anthracene Emissions:				
· lb/hr	< 1.37E-09	< 1.23E-09	< 1.23E-09	< 1.28E-09
· lb/Mgal	< 9.16E-08	< 8.09E-08	< 8.24E-08	< 8.50E-08
Fluoranthene Emissions:				
· lb/hr	2.80E-08	4.14E-08	5.57E-08	4.17E-08
· lb/Mgal	1.87E-06	2.72E-06	3.74E-06	2.78E-06
Fluorene Emissions:				
· lb/hr	6.95E-09	4.94E-09	5.22E-09	5.71E-09
· lb/Mgal	4.65E-07	3.25E-07	3.50E-07	3.80E-07

'<' denotes results calculated using the MDL for results that were non-detect.

TABLE 3 Continued: PAHs

Testing Parameters	Run 1	Run 2	Run 3	Average
Indeo[1,2,3-cd]pyrene Emissions:				
· lb/hr	4.80E-09	2.57E-08	7.35E-09	1.26E-08
· lb/1000 gal	3.21E-07	1.69E-06	4.94E-07	8.34E-07
2-Methyl naphthalene Emissions:				
· lb/hr	6.06E-08	4.94E-08	4.55E-08	5.18E-08
· lb/1000 gal	4.05E-06	3.25E-06	3.05E-06	3.45E-06
Perylene Emissions:				
· lb/hr	< 1.05E-09	< 9.46E-10	< 9.45E-10	< 9.81E-10
· lb/1000 gal	< 7.05E-08	< 6.22E-08	< 6.34E-08	< 6.54E-08
Phenanthrene Emissions:				
· lb/hr	5.84E-08	6.03E-08	6.17E-08	6.01E-08
· lb/1000 gal	3.91E-06	3.97E-06	4.14E-06	4.00E-06
Pyrene Emissions:				
· lb/hr	3.20E-08	3.51E-08	3.13E-08	3.28E-08
· lb/1000 gal	2.14E-06	2.31E-06	2.10E-06	2.18E-06
Total PAH Emissions:				
· lb/hr	< 2.55E-07	< 4.42E-07	< 2.88E-07	< 3.29E-07
· lb/1000 gal	< 1.71E-05	< 2.91E-05	< 1.93E-05	< 2.18E-05
Naphthalene Emissions:				
· lb/hr	1.44E-07	1.09E-07	1.03E-07	1.19E-07
· lb/1000 gal	9.66E-06	7.20E-06	6.93E-06	7.93E-06

'<' denotes results calculated using the MDL for results that were non-detect.

TABLE 4: PCBs

Testing Parameters	Run 1	Run 2	Run 3	Average
PCB-5/8 Emissions:				
· lb/hr	1.47E-09	< 3.80E-10	< 2.85E-10	< 7.11E-10
· lb/1000 gal	9.82E-08	< 2.50E-08	< 1.91E-08	< 4.74E-08
PCB-18 Emissions:				
· lb/hr	< 3.22E-10	2.49E-10	1.63E-10	< 2.45E-10
· lb/1000 gal	< 2.15E-08	1.64E-08	1.10E-08	< 1.63E-08
PCB-28 Emissions:				
· lb/hr	6.14E-10	6.89E-10	3.32E-10	5.45E-10
· lb/1000 gal	4.11E-08	4.53E-08	2.23E-08	3.62E-08
PCB-44 Emissions:				
· lb/hr	< 1.69E-10	4.48E-10	1.72E-10	< 2.63E-10
· lb/1000 gal	< 1.13E-08	2.95E-08	1.15E-08	< 1.74E-08
PCB-52/69 Emissions:				
· lb/hr	2.58E-10	3.54E-10	2.09E-10	2.74E-10
· lb/1000 gal	1.73E-08	2.33E-08	1.40E-08	1.82E-08
PCB-66/76 Emissions:				
· lb/hr	2.74E-10	5.21E-10	2.31E-10	3.42E-10
· lb/1000 gal	1.83E-08	3.43E-08	1.55E-08	2.27E-08
PCB-77 Emissions:				
· lb/hr	2.00E-10	< 9.32E-11	8.84E-11	< 1.27E-10
· lb/1000 gal	1.34E-08	< 6.13E-09	5.93E-09	< 8.49E-09
PCB-81 Emissions:				
· lb/hr	1.07E-10	< 1.34E-11	2.45E-11	< 4.83E-11
· lb/1000 gal	7.15E-09	< 8.84E-10	1.64E-09	< 3.23E-09
PCB-90/101 Emissions:				
· lb/hr	1.73E-10	1.62E-10	< 1.29E-10	< 1.55E-10
· lb/1000 gal	1.16E-08	1.07E-08	< 8.65E-09	< 1.03E-08
PCB-105 Emissions:				
· lb/hr	8.81E-11	< 4.86E-11	6.18E-11	< 6.61E-11
· lb/1000 gal	5.89E-09	< 3.20E-09	4.15E-09	< 4.41E-09
PCB-114 Emissions:				
· lb/hr	< 2.43E-11	< 9.79E-12	< 9.11E-12	< 1.44E-11
· lb/1000 gal	< 1.63E-09	< 6.44E-10	< 6.11E-10	< 9.61E-10
PCB-106/118 Emissions:				
· lb/hr	1.16E-10	7.63E-11	< 7.69E-11	< 8.97E-11
· lb/1000 gal	7.75E-09	5.02E-09	< 5.16E-09	< 5.98E-09
PCB-123 Emissions:				
· lb/hr	3.34E-11	< 8.71E-12	1.54E-11	< 1.92E-11
· lb/1000 gal	2.24E-09	< 5.73E-10	1.03E-09	< 1.28E-09

'<' denotes results calculated using the EDL or EMPC for results that were non-detect

TABLE 4 Continued: PCBs

Testing Parameters	Run 1	Run 2	Run 3	Average
PCB-126 Emissions:				
· lb/hr	1.17E-10	< 2.35E-11	< 3.50E-11	< 5.84E-11
· lb/1000 gal	7.80E-09	< 1.55E-09	< 2.35E-09	< 3.90E-09
PCB-128/162 Emissions:				
· lb/hr	3.91E-11	< 1.98E-11	< 2.22E-11	< 2.70E-11
· lb/1000 gal	2.62E-09	< 1.30E-09	< 1.49E-09	< 1.80E-09
PCB-138/163/164 Emissions:				
· lb/hr	< 6.75E-11	< 4.42E-11	< 7.29E-11	< 6.15E-11
· lb/1000 gal	< 4.52E-09	< 2.91E-09	< 4.89E-09	< 4.11E-09
PCB-153 Emissions:				
· lb/hr	4.92E-11	5.78E-11	6.31E-11	5.67E-11
· lb/1000 gal	3.29E-09	3.80E-09	4.23E-09	3.78E-09
PCB-156 Emissions:				
· lb/hr	< 3.30E-11	< 1.68E-11	< 1.73E-11	< 2.24E-11
· lb/1000 gal	< 2.21E-09	< 1.10E-09	< 1.16E-09	< 1.49E-09
PCB-157 Emissions:				
· lb/hr	2.70E-11	< 8.65E-12	< 1.28E-11	< 1.61E-11
· lb/1000 gal	1.81E-09	< 5.69E-10	< 8.56E-10	< 1.08E-09
PCB-167 Emissions:				
· lb/hr	< 1.05E-11	< 1.02E-11	1.42E-11	< 1.16E-11
· lb/1000 gal	< 7.00E-10	< 6.71E-10	9.56E-10	< 7.75E-10
PCB-169 Emissions:				
· lb/hr	< 2.22E-11	< 8.98E-12	9.78E-12	< 1.37E-11
· lb/1000 gal	< 1.49E-09	< 5.91E-10	6.57E-10	< 9.11E-10
PCB-170 Emissions:				
· lb/hr	3.02E-11	< 1.05E-11	< 7.56E-12	< 1.61E-11
· lb/1000 gal	2.02E-09	< 6.89E-10	< 5.07E-10	< 1.07E-09
PCB-180 Emissions:				
· lb/hr	< 1.81E-11	< 8.38E-12	< 2.90E-11	< 1.85E-11
· lb/1000 gal	< 1.21E-09	< 5.51E-10	< 1.95E-09	< 1.24E-09
PCB-182/187 Emissions:				
· lb/hr	< 1.81E-11	< 7.03E-12	< 2.23E-11	< 1.58E-11
· lb/1000 gal	< 1.21E-09	< 4.62E-10	< 1.49E-09	< 1.05E-09
PCB-189 Emissions:				
· lb/hr	1.98E-11	< 7.16E-12	1.71E-11	< 1.47E-11
· lb/1000 gal	1.32E-09	< 4.71E-10	1.15E-09	< 9.82E-10
PCB-195 Emissions:				
· lb/hr	< 4.10E-12	< 4.70E-12	< 1.16E-11	< 6.80E-12
· lb/1000 gal	< 2.74E-10	< 3.09E-10	< 7.79E-10	< 4.54E-10

‘<’ denotes results calculated using the EDL or EMPC for results that were non-detect

TABLE 4 Continued: PCBs

Testing Parameters	Run 1	Run 2	Run 3	Average
PCB-206 Emissions:				
· lb/hr	< 1.66E-11	3.03E-11	3.63E-11	< 2.77E-11
· lb/1000 gal	< 1.11E-09	1.99E-09	2.44E-09	< 1.85E-09
PCB-209 Emissions:				
· lb/hr	< 1.26E-11	3.17E-11	< 3.00E-11	< 2.48E-11
· lb/1000 gal	< 8.41E-10	2.08E-09	< 2.02E-09	< 1.65E-09
Total PCB Emissions:				
· lb/hr	4.70E-08	1.55E-08	8.77E-09	2.38E-08
· lb/1000 gal	3.15E-06	1.02E-06	5.89E-07	1.59E-06

'<' denotes results calculated using the EDL or EMPC for results that were non-detect

VII) Comments & Concerns:

- 1) Test run #1 for the Method 23 and Method 29 sample trains collected less than intended 120 dscf.
- 2) Table 2.1 incorrectly states that all runs were 180 minutes each. Run #2 and #3 were 200 min each to ensure that at least 120 dscf of sample was collected.
- 3) Test run #1 lb/1000 gal calculations use a firing rate of 15 gallons per hour but the process data on page 195 shows a firing rate of 14.95 gallons per hour for test run #1.
- 4) A calculation error was discovered in the run #1 PAH lb/1000 gal calculations. Revised PAH results were submitted to ODEQ on December 28, 2020.
- 5) An error was discovered in blank corrections for the metal results. Revised metal results were submitted to ODEQ on January 4, 2021.

VIII) Overall Evaluation: The test methods conducted and the data provided are sufficient to evaluate the emissions from the unit at the operating condition tested.

cc: Scott Briggs
Oil Re-Refining Company
Db, Industrial Oils, Inc.
4150 N Suttle Road
Portland, OR 97217

Andy Winkler
Environmental Technical Services
2105 Corey Road
Central Point, OR 97502