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Alaska Department of Environmental Conservation
Air Quality Division
Air Permits Program
555 Cordova Street
Anchorage, AK 99501
Attn: Joshua Klina

Delivered via email: Joshua.Klina@alaska.gov

RE: Comments on Draft Title V Permit AQ0433TVP04

July 13, 2022

Dear Mr. Klina,

Thank you for your efforts in preparing the Title V Renewal Permit for Westward Seafoods (AQ0433TVP04) and for the opportunity to review and comment on the draft permit. Please consider the following revisions to the draft permit as described below.

Section 1 – Stationary Source Information

General Information

Stationary Source Physical Address

In the application, coordinates provided were 53.858 N 166.552 W. In the draft permit, the coordinates state 166.554 W. Please use the provided coordinates.

Section 3 – State Requirements

Visible Emissions Monitoring, Recordkeeping and Reporting (MR&R)

Liquid Fuel-Burning Equipment (EU IDs 1-5) ~~and Meal Dryer (EU ID 7)~~

DEC removed the visible emissions monitoring requirement under Conditions 2 – 4 for the meal dryer, EU ID 7, as requested in the permit application. Therefore, please remove the phrase “and Meal Dryer (EU ID 7)” in the sub-heading preceding Conditions 2 – 4.

Furthermore, the Permittee provided supporting documentation with the application showing that EU ID 7 is an insignificant emission unit on an emissions rate basis, with



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PM-10 emissions less than 0.75 tons per year [18 AAC 50.326(e)(5)]. Please add a note to Table A stating that EU ID 7 is an insignificant emission unit on this basis.

The permit and TAR mistakenly refer to EU ID 7 as fuel-burning equipment. This unit does not burn fuel. Rather, it utilizes steam from the facility's boilers to heat drying plates.

Best Available Control Technology

Condition 20 – Nitrogen Dioxide BACT Requirements

In Condition 20.1e, the permit language states, “install, calibrate, certify, operate, and maintain [NOx and O2 CEMS] in accordance with Condition 80,” but the correct reference here is Condition 73.

Section 4 – Federal Requirements

NESHAP Subpart JJJJJ - Industrial, Commercial, and Institutional Boilers, EU IDs 4 and 5

Condition 43 – NESHAP Subpart JJJJJ Reporting Requirements

Please modify the reporting requirement in Condition 43.1 to reflect the updated tune-up frequency of every 5 years, rather than biennially, for EU IDs 4 and 5: “Prepare, by March 1, and submit to the EPA and the Department upon request, a biennial 5-year Compliance Certification report for the previous 5 calendar years containing the information specified in Conditions 43.1.a and 43.1.b.

Condition 45 – CAM Requirements

This condition refers to the CAM plan in Section 14, but the correct reference for CAM is Section 15.

Section 5 – General Conditions

Standard Terms and Conditions

Condition 62 – Technology-Based Emission Standard

For added clarity, we suggest adding the underlined parenthetical language as follows: “If an unavoidable emergency... causes emissions in excess of a technology-based emission standard listed in Conditions 31 (boilers) and 47 (refrigerants), the Permittee shall...”



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Section 15 – Compliance Assurance Monitoring (CAM) Plan

Measurement Approach

Emissions Monitoring Frequency

In Form E3 of the renewal application submitted September 22, 2020, the Permittee requested to modify the Compliance Assurance Monitoring (CAM) plan with a reduction to the NOx emissions monitoring frequency for EU IDs 1-3 using the handheld analyzer from monthly to semiannually (every six months) following the termination of the Consent Decree No. 3:17-cv-00087-TMB on date 05/13/2021.

The CAM plan in Section 15 of the renewal permit has not been modified with the Permittee's suggested changes from the application submittal. The Permittee is now providing additional justification for the adjusted monitoring frequency for the Department's consideration.

According to the Statement of Basis for AQ0433TVP03 Rev. 1, Condition 41 and Section 15, the Permittee has the option to request the reduced monitoring frequency per the following statement: "If the results of the monthly NOx monitoring indicate that a reduced monitoring frequency is warranted, the Permittee can submit to the Department an application for permit modification that justifies the proposed revision to the CAM Plan in Section 15."

The Permittee used the following criteria from the CAM rule in Part 64 of Title 40 to evaluate whether a reduced monitoring frequency is warranted:

40 C.F.R. 64.3(b)(4)(i):

"The frequency of monitoring and data collection should be commensurate with the time period over which a change in control device performance, that would require actions by the owner or operator to return operations within normal ranges or designated conditions, is likely to be observed."

In response to the § 64.3(b)(4)(i) criteria:

The NOx emissions monitoring data collected for each of EU IDs 1-3 weekly from Jan. 2017 – Sept. 2018 (86 weeks) and monthly from Sept. 2018 – June 2022 (51 months) is provided in Attachment A.

The 51 monthly monitoring results for each of EU IDs 1-3 from Sept. 2018 – June 2022 were plotted on graphs showing the NOx emissions in lbs/hr along with the

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corresponding engine loads. The graphs are provided in Attachment B. (The weekly monitoring data from Jan. 2017 – Sept. 2018 was not graphed because of gaps in the data sets when the generators were not being operated).

From the data sets in Attachment A and the graphs in Attachment B, it is evident that the NOx emissions for each of EU IDs 1-3 have generally remained in the range of 20 to 35 lbs/hr, with very few exceptions. The highest NOx emissions measured for any of EU IDs 1-3 since monitoring commenced in Jan. 2017 was 36.83 lbs/hr for EU ID 2 on 1/28/21.

After collecting more than five and a half years of monitoring data there have been no instances of a change in control device performance that required actions by the Permittee to return operations within the permitted range of up to 42.3 lbs/hr of NOx emissions.

Therefore, a semiannual frequency of monitoring and data collection is adequate and perhaps even conservative, as the monitoring data up until present has demonstrated that a change in control device performance resulting in an exceedance of the permit limit is not likely to occur within a six-month period.

40 C.F.R. 64.3(c):

“In designing monitoring to meet the requirements in paragraphs (a) and (b) of this section, the owner or operator shall take into account site-specific factors including the applicability of existing monitoring equipment and procedures, the ability of the monitoring to account for process and control device operational variability, the reliability and latitude built into the control technology, and the level of actual emissions relative to the compliance limitation.”

In response to the § 64.3(c) criteria:

Regarding the ability of the monitoring to account for process and control device operational variability, a clear correlation exists between engine load and NOx emissions, as shown in the graphs in Attachment B. Likewise, in the source test performed March 8 – 11, 2022 on EU IDs 1-3, the NOx emissions were highly dependent on the engine load, as shown in the source test result summary tables in Attachment C. NOx emissions are directly proportional to load in diesel compression ignition engines, and the evidence collected over the past several years corroborates this understanding.

During the source test, NOx emissions for the three engines remained within the 32 – 37 lb/hr range even when tested at the highest load rates of 90 – 100%. However, during actual operation, the engines very rarely operate at more than 80% load as shown in the Attachment B graphs. Because the engines typically operate at less than 80% load, it is

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expected that NOx emission rates during actual operation will correspond more closely to the second (mid-range) set of runs conducted during the source test (i.e. the 75-76% load rates shown in the Attachment C summary tables, corresponding to NOx emissions in the 27 – 31 lb/hr range).

Regarding the reliability and latitude built into the control technology and the level of actual emissions relative to the compliance limitation, please see the response to the § 64.3(b)(4)(i) criteria above.

Thus, the physical and operational design of these engines, the redundant monitoring strategy (periodic source testing coupled with periodic hand-held analyzer monitoring), and the normal operating range of the units coalesce to meet the criteria described in § 64.3(c).

The Department previously expressed an openness to reducing the monitoring frequency, and the compiled data satisfies the referenced criteria. Therefore, we again request that ADEC reduce the monitoring frequency to semiannual intervals.

Statement of Basis*Compliance History*

This section should be updated to make it clear that the Consent Decree No. 3:17-cv-00087-TMB was terminated on the date 05/13/2021 and that Westward Seafoods is no longer subject to the requirements to implement increased monitoring, recordkeeping, and reporting requirements for EU IDs 1 – 3, perform increased NOx emissions testing with the handheld analyzer, submit additional compliance reports, submit records and reports to the EPA and Department via the electronic portal, and hire a third party verifier to conduct inspections of the facility.

*Statement of Basis for the Permit Conditions***Condition 41 and Section 15, Compliance Assurance Monitoring (CAM)**

This section should be updated to remove all mention of Consent Decree No. 3:17-cv-00087-TMB and detail the outcome of the Permittee's request to reduce the monitoring frequency from monthly to semiannual frequency, including the Department's reasoning and legal basis for approving or denying this request.



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Please feel free to call me at (907) 581-7543 to discuss the requests and supplemental information provided in these comments, or for any further questions that you may have regarding the preparation of the Title V Renewal Permit.

Sincerely,

Dr. Greg Peters
Director of Environmental Compliance
Westward Seafoods, Inc.

ATTACHMENT A
NOx Monitoring Data, EU IDs 1-3
Jan. 2017 – June 2022

EU ID 1 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 1	1/10/2017			Gen. not run						
Week 2	1/19/2017	1634	74%	107.7	103	710	13.7	138,635	2.258	33.72
Week 3	1/26/2017	1704	77%	107	137	700	13.6	138,635	2.193	32.53
Week 4	2/2/2017	1708	78%	106.11	137	710	13.7	138,635	2.268	33.36
Week 5	2/9/2017	1698	77%	108	103	717.3	13.8	138,635	2.323	34.79
Week 6	2/16/2017	1681	76%	110.3	103	715.5	13.9	138,635	2.331	35.64
Week 7	2/23/2017	1161	53%	79.1	46	703	14.1	138,635	2.385	26.15
Week 8	3/2/2017	1634	74%	107	103	481.7	16.4	138,635	2.428	36.02
Week 9	3/9/2017	1752	80%	111.6	103	486.1	15.7	138,635	2.127	32.92
Week 10	3/16/2017	1710	78%	107.12	103	834.5	13.0	138,635	2.423	35.98
Week 11	3/23/2017	1688	77%	106.59	103	821.59	13.0	138,635	2.370	35.02
Week 12	3/30/2017	1700	77%	96.07	103	800	13.0	138,635	2.314	30.81
Week 13	4/6/2017	1266	58%	80	46	821.8	13.3	138,635	2.477	27.47
Week 14	4/13/2017	1500	68%	94.5	69	789.1	13.1	138,635	2.308	30.24
Week 15	4/20/2017			Gen. not run						
Week 16	4/27/2017			Gen. not run						
Week 17	5/4/2017			Gen. not run						
Week 18	5/11/2017			Gen. not run						
Week 19	5/18/2017			Gen. not run						
Week 20	5/25/2017			Gen. not run						
Week 21	6/1/2017			Gen. not run						
Week 22	6/8/2017			Gen. not run						
Week 23	6/15/2017	1719	78%	107	103	780.5	12.7	138,635	2.194	32.54
Week 24	6/22/2017			Gen. not run						
Week 25	6/29/2017	1664	76%	106	103	727.4	12.7	138,635	2.034	29.90
Week 26	7/6/2017	1607	73%	101	103	766	12.7	138,635	2.142	30.00
Week 27	7/13/2017	1358	62%	90.34	69	740	12.8	138,635	2.082	26.08
Week 28	7/20/2017	1500	68%	100	103	738	12.9	138,635	2.126	29.48
Week 29	7/27/2017	1451	66%	95	69	775	12.8	138,635	2.186	28.79

EU ID 1 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 30	8/3/2017	1408	64%	97	69	765.8	12.7	138,635	2.147	28.87
Week 31	8/10/2017	1689	77%	106	103	706	12.6	138,635	1.960	28.81
Week 32	8/17/2017	1571	71%	100	103	733	12.8	138,635	2.083	28.88
Week 33	8/24/2017	1747	79%	117.5	103	708	12.5	138,635	1.928	31.41
Week 34	8/31/2017	1048	48%	72	46	894.6	12.9	138,635	2.561	25.57
Week 35	9/7/2017	1622	74%	108	103	690	12.5	138,635	1.879	28.14
Week 36	9/14/2017	1268	58%	84	60	773	12.8	138,635	2.194	25.55
Week 37	9/21/2017	1328	60%	89	78	702	12.7	138,635	1.956	24.14
Week 38	9/28/2017			Gen. not run						
Week 39	10/5/2017	1351	61%	88	69	778	12.8	138,635	2.189	26.71
Week 40	10/12/2017	1321	60%	90	69	828	12.7	138,635	2.319	28.93
Week 41	10/19/2017			Gen. not run						
Week 42	10/26/2017	1239	56%	82	46	1053	12.8	138,635	2.989	33.98
Week 43	11/2/2017	1475	67%	96	103	894	12.9	138,635	2.547	33.90
Week 44	11/9/2017			Gen. not run						
Week 45	11/16/2017	959	44%	65	46	1018	13.0	138,635	2.955	26.63
Week 46	11/23/2017			Gen. not run						
Week 47	11/30/2017			Gen. not run						
Week 48	12/7/2017			Gen. not run						
Week 49	12/14/2017			Gen. not run						
Week 50	12/21/2017			Gen. not run						
Week 51	12/28/2017			Gen. not run						
Week 52	1/4/2018	1465	67%	96	103	859	12.9	138,635	2.459	32.73
Week 53	1/11/2018			Gen. not run						
Week 54	1/15/2018	1456	66%	95	103	888	12.7	138,635	2.484	32.71
Week 55	1/22/2018	1632	74%	83	46	980	13.2	138,635	2.934	33.76
Week 56	1/30/2018	1628	74%	104	138	901	12.7	138,635	2.517	36.29
Week 57	2/5/2018	1143	52%	71	46	1007	13.0	138,635	2.912	28.67
Week 58	2/12/2018	1596	73%	100	138	776	12.8	138,635	2.208	30.61

EU ID 1 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 59	2/19/2018	1067	49%	104	46	702	12.5	138,635	1.923	27.73
Week 60	2/26/2018	1136	52%	78	46	885	12.9	138,635	2.534	27.40
Week 61	3/5/2018	1594	72%	99	138	760	12.6	138,635	2.092	28.72
Week 62	3/12/2018	1573	72%	103	138	899	12.5	138,635	2.463	35.17
Week 63	3/19/2018	1530	70%	100	138	850	12.7	138,635	2.366	32.80
Week 64	3/26/2018	1727	79%	113	46	826	12.5	138,635	2.244	35.16
Week 65	4/2/2018	1171	53%	74	46	915	12.9	138,635	2.626	26.94
Week 66	4/9/2018	1101	50%	78	46	899	12.8	138,635	2.536	27.42
Week 67	4/16/2018	1140	52%	77	46	1064	12.8	138,635	3.012	32.16
Week 68	4/23/2018			Gen. not run						
Week 69	4/30/2018			Gen. not run						
Week 70	5/7/2018			Gen. not run						
Week 71	5/14/2018	609	28%	44	23	1068	14.0	138,635	3.560	21.72
Week 72	5/21/2018			Gen. not run						
Week 73	5/28/2018			Gen. not run						
Week 74	6/4/2018	1278	58%	85	46	1052	12.7	138,635	2.942	34.67
Week 75	6/11/2018	1188	54%	79	46	1056	12.8	138,635	2.986	32.70
Week 76	6/18/2018	1596	73%	104	69	940	12.4	138,635	2.542	36.65
Week 77	6/25/2018	1627	74%	106.6	46	903	12.4	138,635	2.445	36.13
Week 78	7/2/2018	1658	75%	105	138	704	12.6	138,635	1.952	28.42
Week 79	7/9/2018	1713	78%	110	138	823	12.5	138,635	2.239	34.14
Week 80	7/16/2018	1752	80%	115	138	692	12.4	138,635	1.869	29.80
Week 81	7/23/2018	1603	73%	105	173	647	12.5	138,635	1.773	25.81
Week 82	7/30/2018	960	44%	65	69	862	13.0	138,635	2.499	22.52
Week 83	8/6/2018	1682	76%	108	173	627	12.4	138,635	1.700	25.45
Week 84	8/13/2018	1646	75%	108	173	663	12.6	138,635	1.821	27.26
Week 85	8/20/2018	1651	75%	108	173	626	12.5	138,635	1.705	25.53
Week 86	8/27/2018	1119	51%	73	138	683	12.8	138,635	1.934	19.57
Month 1	9/10/2018	1574	72%	108	173	601	12.3	138,635	1.608	24.08

EU ID 1 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Month 2	10/9/2018	1125	51%	83	138	693	12.2	138,635	1.835	21.12
Month 3	11/5/2018	1183	54%	77	138	699	12.5	138,635	1.913	20.42
Month 4	12/3/2018	804	37%	58	69	881	12.8	138,635	2.497	20.08
Month 5	1/3/2019	1221	56%	80	69	966	12.8	138,635	2.718	30.15
Month 6	2/3/2019	1277	58%	86	86	774	12.5	138,195	2.116	25.14
Month 7	3/3/2019	1821	83%	119	138	771	12.1	138,235	2.009	33.05
Month 8	4/3/2019	1573	72%	107	138	623	11.3	138,266	1.488	22.02
Month 9	5/2/2019	968	44%	67	69	810	13.2	138,266	2.419	22.41
Month 10	6/1/2019	1141	52%	78	121	751	12.9	138,352	2.139	23.09
Month 11	6/27/2019	969	44%	69	46	702	12.9	138,352	2.015	19.23
Month 12	7/24/2019	1596	73%	106	173	662	12.4	138,523	1.792	26.32
Month 13	8/22/2019	1113	51%	75	69	752	12.4	137,900	2.022	20.91
Month 14	9/21/2019	1194	54%	80	138	616	13.4	137,900	1.891	20.86
Month 15	10/19/2019	1090	50%	76	46	857	12.5	138,523	2.348	24.72
Month 16	11/15/2019	1317	60%	90	46	970	12.1	138,590	2.525	31.49
Month 17	12/21/2019	873	40%	62	23	1067	12.6	138,590	2.948	25.33
Month 18	1/19/2020	1380	63%	86	69	852	13.2	137,682	2.534	30.01
Month 19	2/18/2020	976	44%	66	23	1011	12.6	137,915	2.797	25.46
Month 20	3/16/2020	1251	57%	79	46	826	12.4	138,579	2.229	24.40
Month 21	4/1/2020	1232	56%	83	46	906	12.6	138,579	2.512	28.90
Month 22	4/29/2020	1372	62%	95	69	764	12.4	136,748	2.049	26.62
Month 23	5/27/2020	1390	63%	92	69	947	12.5	137,539	2.585	32.72
Month 24	6/25/2020	1203	55%	82	46	762	12.4	137,539	2.066	23.30
Month 25	7/24/2020			Gen. not run						
Month 26	8/12/2020	1106	50%	77	23	1011	12.3	138,660	2.709	28.92
Month 27	9/11/2020	1566	71%	110	138	822	12.4	137,610	2.228	33.73
Month 28	10/9/2020	1610	73%	101	138	800	12.3	137,528	2.128	29.56
Month 29	10/29/2020	1477	67%	100.2	138	415.95	12.5	137,528	1.133	15.61
Month 30	11/29/2020	944	43%	62.25	23	867.2	12.5	137,528	2.379	20.37

EU ID 1 Testo 350 NOx calculations

EU ID 2 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 1	1/10/2017	1514	69%	98	69	780	13.2	138,635	2.332	31.69
Week 2	1/19/2017	1720	78%	111.15	103	783.8	13.0	138,635	2.261	34.84
Week 3	1/26/2017	1823	83%	115.5	103	753	13.2	138,635	2.246	35.96
Week 4	2/2/2017	1697	77%	103.22	103	755.8	13.3	138,635	2.290	32.77
Week 5	2/9/2017	1709	78%	113.4	103	726.3	13.3	138,635	2.200	34.59
Week 6	2/16/2017	1696	77%	109.7	103	761.5	13.2	138,635	2.274	34.58
Week 7	2/23/2017	1226	56%	88.65	46	784.4	13.8	138,635	2.519	30.96
Week 8	3/2/2017	1629	74%	91.3	103	502.6	16.0	138,635	2.367	29.96
Week 9	3/9/2017	1747	79%	109.5	103	516.4	15.6	138,635	2.234	33.92
Week 10	3/16/2017	1715	78%	106.03	103	848.2	12.6	138,635	2.344	34.45
Week 11	3/23/2017	1641	75%	104.06	103	830.85	12.5	138,635	2.258	32.57
Week 12	3/30/2017	1702	77%	125.3	103	779	12.5	138,605	2.117	36.76
Week 13	4/6/2017	1326	60%	87	46	825	12.7	138,635	2.316	27.93
Week 14	4/13/2017	1568	71%	99.75	69	790.8	12.6	138,635	2.190	30.29
Week 15	4/20/2017	1266	58%	80	69	884.3	12.6	138,635	2.452	27.20
Week 16	4/27/2017	1183	54%	80	46	909.5	12.8	138,635	2.569	28.49
Week 17	5/4/2017			Gen. not run						
Week 18	5/11/2017	1177	54%	80	46	907.35	12.7	138,635	2.544	28.21
Week 19	5/18/2017	1134	52%	75	46	913	12.6	138,635	2.508	26.07
Week 20	5/25/2017	1245	57%	84	46	898	12.5	138,635	2.458	28.62
Week 21	6/1/2017	1309	60%	84	46	849	12.5	138,635	2.318	26.99
Week 22	6/8/2017	1207	55%	79	46	889	12.5	138,635	2.418	26.49
Week 23	6/15/2017	1647	75%	106	103	822.3	12.4	138,635	2.208	32.45
Week 24	6/22/2017	1733	79%	110	103	817	12.3	138,635	2.179	33.22
Week 25	6/29/2017	1632	74%	106	103	788	12.4	138,635	2.119	31.13
Week 26	7/6/2017	1486	68%	95	69	817	12.3	138,635	2.181	28.73
Week 27	7/13/2017	1629	74%	99.94	103	834	12.0	138,635	2.159	29.91
Week 28	7/20/2017	1421	65%	94	69	834	12.4	138,635	2.261	29.46
Week 29	7/27/2017	1445	66%	94	69	858	12.2	138,635	2.272	29.61

EU ID 2 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 30	8/3/2017	1355	62%	87	46	838	12.4	138,635	2.261	27.27
Week 31	8/10/2017	1581	72%	101	103	807	12.2	138,635	2.137	29.92
Week 32	8/17/2017	1579	72%	102	103	773	12.3	138,635	2.066	29.22
Week 33	8/24/2017	1671	76%	106.5	103	923	11.9	138,635	2.342	34.57
Week 34	8/31/2017	1755	80%	117	138	738	12.0	138,635	1.897	30.78
Week 35	9/7/2017	1643	75%	104	138	669	12.3	138,635	1.784	25.72
Week 36	9/14/2017			Gen. not run						
Week 37	9/21/2017	1423	65%	92	103	746	12.3	138,635	1.978	25.23
Week 38	9/28/2017	1367	62%	93	99	797	12.4	138,635	2.140	27.59
Week 39	10/5/2017			Gen. not run						
Week 40	10/12/2017	1354	62%	93	99	978	12.2	138,635	2.566	33.09
Week 41	10/19/2017	1384	63%	90	81	1016	12.3	138,635	2.709	33.80
Week 42	10/26/2017			Gen. not run						
Week 43	11/2/2017	1331	61%	86	46	1151	12.3	138,635	3.052	36.38
Week 44	11/9/2017	1523	69%	95	103	973	12.2	138,635	2.565	33.78
Week 45	11/16/2017			Gen. not run						
Week 46	11/23/2017			Gen. not run						
Week 47	11/30/2017			Gen. not run						
Week 48	12/7/2017			Gen. not run						
Week 49	12/14/2017			Gen. not run						
Week 50	12/21/2017			Gen. not run						
Week 51	12/28/2017	876	40%	60	23	1217	12.6	138,635	3.363	27.97
Week 52	1/4/2018			Gen. not run						
Week 53	1/11/2018			Gen. not run						
Week 54	1/15/2018			Gen. not run						
Week 55	1/22/2018	1089	50%	66	46	1050	13.6	138,635	3.317	30.35
Week 56	1/29/2018	1296	59%	86	112	883	13.3	138,635	2.654	31.64
Week 57	2/5/2018	1138	52%	71	112	986	13.3	138,635	2.975	29.29
Week 58	2/12/2018	1639	75%	96	173	819	13.1	138,635	2.402	31.97

EU ID 2 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 59	2/19/2018	1594	72%	100	173	801	12.8	138,635	2.271	31.48
Week 60	2/26/2018	1626	74%	104	173	881	12.7	138,635	2.458	35.44
Week 61	3/5/2018	1595	73%	106	138	881	12.8	138,635	2.497	36.70
Week 62	3/12/2018	1619	74%	105	173	765	12.8	138,635	2.177	31.69
Week 63	3/19/2018	1672	76%	105	173	760	12.9	138,635	2.165	31.52
Week 64	3/26/2018	1145	52%	76	46	1104	12.7	138,635	3.076	32.41
Week 65	4/2/2018	1108	50%	72	23	1247	13.0	138,635	3.620	36.13
Week 66	4/9/2018	1754	80%	112	173	790	12.7	138,635	2.215	34.39
Week 67	4/16/2018	1102	50%	74	46	1054	12.9	138,635	3.037	31.15
Week 68	4/23/2018			Gen. not run						
Week 69	4/30/2018			Gen. not run						
Week 70	5/7/2018			Gen. not run						
Week 71	5/14/2018	647	29%	47	23	1139	14.0	138,635	3.764	24.52
Week 72	5/21/2018			Gen. not run						
Week 73	5/28/2018			Gen. not run						
Week 74	6/4/2018	1273	58%	79	46	1120	13.0	138,635	3.231	35.38
Week 75	6/11/2018	1254	57%	78	69	1055	13.0	138,635	3.078	33.29
Week 76	6/18/2018	1597	73%	99	151	889	12.9	138,635	2.536	34.80
Week 77	6/25/2018	1464	67%	90.5	69	1034	12.6	138,635	2.850	35.76
Week 78	7/2/2018	1620	74%	102	138	752	12.9	138,635	2.158	30.52
Week 79	7/9/2018	1739	79%	110	138	767	12.8	138,635	2.180	33.24
Week 80	7/16/2018	1577	72%	99	138	839	12.8	138,635	2.381	32.68
Week 81	7/23/2018	1651	75%	101	173	745	12.8	138,635	2.107	29.50
Week 82	7/30/2018	1266	58%	82	69	851	12.8	138,635	2.421	27.53
Week 83	8/9/2018	1233	56%	80	69	948	12.7	138,635	2.645	29.33
Week 84	8/13/2018	1553	71%	101	138	890	12.6	138,635	2.456	34.39
Week 85	8/20/2018	1688	77%	108	138	762	12.7	138,635	2.136	31.99
Week 86	8/27/2018	1110	50%	72	69	795	13.0	138,635	2.317	23.12
Month 1	9/10/2018			Gen. not run						

EU ID 2 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Month 2	10/9/2018	1213	55%	80	69	962	12.8	138,635	2.730	30.28
Month 3	11/12/2018	1027	47%	69	69	1005	13.0	138,635	2.910	27.84
Month 4	12/3/2018	777	35%	55	69	850	13.6	138,635	2.667	20.33
Month 5	1/3/2019	1134	52%	74	69	895	13.2	138,635	2.659	27.28
Month 6	2/3/2019	1513	69%	96	69	886	12.8	138,195	2.515	33.36
Month 7	3/3/2019	1882	86%	121	173	720	12.6	138,235	1.992	33.32
Month 8	4/3/2019	1635	74%	104	138	653	12.4	138,266	1.754	25.22
Month 9	5/2/2019	941	43%	63	23	897	13.0	138,266	2.588	22.54
Month 10	6/1/2019	1065	48%	71	23	1083	12.7	138,352	3.022	29.68
Month 11	6/27/2019	990	45%	65	23	899	13.1	138,352	2.650	23.83
Month 12	7/24/2019	1613	73%	106	138	686	12.5	138,523	1.873	27.50
Month 13	8/22/2019	1232	56%	85	69	742	11.6	137,900	1.824	21.38
Month 14	9/21/2019	1225	56%	84	69	753	10.9	137,900	1.734	20.08
Month 15	10/19/2019	1346	61%	90	46	944	12.3	138,523	2.526	31.49
Month 16	11/15/2019	1176	53%	76	23	1127	12.8	138,590	3.191	33.61
Month 17	12/21/2019	912	41%	60	23	1125	13.0	138,590	3.278	27.26
Month 18	1/19/2020	1427	65%	93	69	986	12.8	137,682	2.799	35.83
Month 19	2/18/2020	908	41%	61	23	1020	12.7	137,915	2.867	24.12
Month 20	3/16/2020	1202	55%	78	46	840	12.5	138,579	2.291	24.76
Month 21	4/1/2020	1188	54%	80	46	972	12.3	138,579	2.592	28.74
Month 22	4/29/2020	1364	62%	89	69	874	12.7	136,748	2.438	29.68
Month 23	5/27/2020	1404	64%	92	69	945	12.6	137,539	2.599	32.88
Month 24	6/25/2020	1204	55%	79	46	936	12.6	137,539	2.580	28.03
Month 25	7/24/2020	961	44%	64	23	1046	13.1	138,660	3.087	27.40
Month 26	8/12/2020	1068	49%	72	23	1023	12.4	138,660	2.773	27.69
Month 27	9/11/2020	1497	68%	96	69	947	12.6	137,610	2.604	34.40
Month 28	10/9/2020	1582	72%	103	138	913	12.4	137,528	2.452	34.73
Month 29	10/29/2020	1467	67%	98.5	69	792.83	12.5	137,528	2.165	29.32
Month 30	11/29/2020	952	43%	64	23	1151.8	12.6	137,528	3.186	28.05

EU ID 2 Testo 350 NOx calculations

EU ID 3 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 1	1/10/2017	1427	65%	82	69	746.85	13.7	138,635	2.366	26.89
Week 2	1/19/2017	1514	69%	88.8	69	726	13.8	138,635	2.332	28.71
Week 3	1/26/2017	1776	81%	98.6	103	697	13.5	138,635	2.169	29.65
Week 4	2/2/2017	1658	75%	94	103	722.2	13.7	138,635	2.307	30.06
Week 5	2/9/2017	1714	78%	98.7	103	680.7	13.7	138,635	2.177	29.79
Week 6	2/16/2017	1842	84%	106.2	103	673.8	13.7	138,635	2.146	31.60
Week 7	2/23/2017	1191	54%	70.7	46	667.9	14.3	138,635	2.321	22.75
Week 8	3/2/2017	1584	72%	91.3	103	477.5	16.3	138,635	2.381	30.13
Week 9	3/9/2017	1668	76%	97.4	103	502.9	15.8	138,635	2.257	30.48
Week 10	3/16/2017	1643	75%	92.3	103	834.8	13.0	138,635	2.420	30.97
Week 11	3/23/2017	1663	76%	94.86	103	828.19	12.9	138,635	2.371	31.18
Week 12	3/30/2017	1727	79%	111	103	784.4	12.9	138,635	2.240	34.47
Week 13	4/6/2017	1341	61%	77	46	783.4	13.0	138,635	2.274	24.28
Week 14	4/13/2017	1528	69%	85.44	69	774.3	13.5	138,635	2.387	28.27
Week 15	4/20/2017	1290	59%	80	69	779	13.6	138,635	2.431	26.96
Week 16	4/27/2017	1276	58%	82	46	788.6	13.3	138,635	2.373	26.98
Week 17	5/4/2017	1183	54%	76	46	813.5	13.4	138,635	2.497	26.31
Week 18	5/11/2017	1084	49%	71	46	824.94	13.7	138,635	2.624	25.83
Week 19	5/18/2017	1044	47%	69	46	823.4	13.4	138,635	2.528	24.18
Week 20	5/25/2017	1350	61%	86	46	790	13.5	138,635	2.445	29.15
Week 21	6/1/2017	1309	60%	85	58	779	13.1	138,635	2.285	26.92
Week 22	6/8/2017	1198	54%	79	46	777	13.3	138,635	2.329	25.51
Week 23	6/15/2017	1700	77%	108	103	821	12.8	138,635	2.322	34.76
Week 24	6/22/2017	1717	78%	110	103	786	12.8	138,635	2.234	34.06
Week 25	6/29/2017	1788	81%	113	103	789	12.9	138,635	2.259	35.39
Week 26	7/6/2017	1517	69%	98	69	768	12.9	138,635	2.213	30.06
Week 27	7/13/2017	1602	73%	101	69	802	12.8	138,635	2.262	31.68
Week 28	7/20/2017	1473	67%	94	69	788	13.1	138,635	2.308	30.08
Week 29	7/27/2017	1663	76%	107	69	782	12.7	138,635	2.190	32.48

EU ID 3 Testo 350 NOx calculations

	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 30	8/3/2017	1467	67%	95	69	774	12.9	138,635	2.211	29.11
Week 31	8/10/2017	1579	72%	99	69	815.5	12.8	138,635	2.306	31.65
Week 32	8/17/2017	1575	72%	98	69	759.3	12.9	138,635	2.163	29.39
Week 33	8/24/2017	1150	52%	75	46	805	12.9	138,635	2.293	23.85
Week 34	8/31/2017	1105	50%	74	46	761	13.0	138,635	2.215	22.72
Week 35	9/7/2017	1662	76%	111	103	638	12.6	138,635	1.771	27.26
Week 36	9/14/2017			Gen. not run						
Week 37	9/21/2017			Gen. not run						
Week 38	9/28/2017	1472	67%	96	69	715	12.8	138,635	2.019	26.88
Week 39	10/5/2017	1225	56%	81	60	735	12.9	138,635	2.112	23.72
Week 40	10/12/2017	1304	59%	85	60	943	12.9	138,635	2.686	31.66
Week 41	10/19/2017	1295	59%	86	69	924	12.7	138,635	2.591	30.89
Week 42	10/26/2017	1187	54%	76	69	801	12.9	138,635	2.308	24.31
Week 43	11/2/2017			Gen. not run						
Week 44	11/9/2017	1546	70%	95	69	890	12.8	138,635	2.520	33.19
Week 45	11/16/2017	1094	50%	69	46	957	13.0	138,635	2.778	26.57
Week 46	11/23/2017			Gen. not run						
Week 47	11/30/2017			Gen. not run						
Week 48	12/7/2017			Gen. not run						
Week 49	12/14/2017			Gen. not run						
Week 50	12/21/2017			Gen. not run						
Week 51	12/28/2017	476	22%	36	23	900	14.5	138,635	3.235	16.15
Week 52	1/4/2018			Gen. not run						
Week 53	1/11/2018			Gen. not run						
Week 54	1/15/2018	1389	63%	89	69	953	12.9	138,635	2.729	33.67
Week 55	1/22/2018			Gen. not run						
Week 56	1/29/2018	1408	64%	89	69	994	13.0	138,635	2.889	35.65
Week 57	2/5/2018	1274	58%	83	69	920	13.0	138,635	2.664	30.65
Week 58	2/12/2018	1663	76%	106	69	864	12.8	138,635	2.440	35.86

EU ID 3 Testo 350 NOx calculations

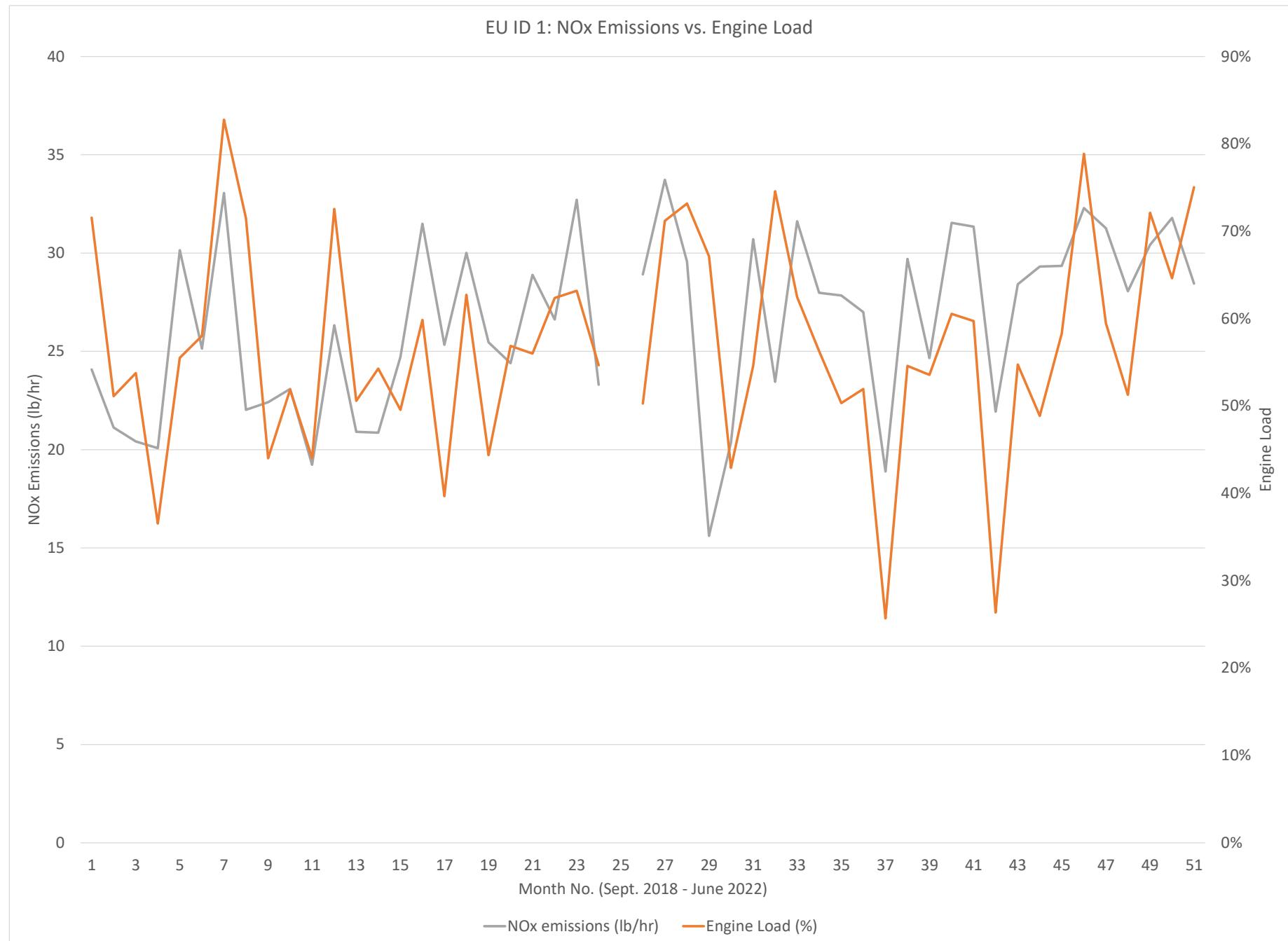
	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Week 59	2/19/2018	1791	81%	100	69	753	12.8	138,635	2.121	29.41
Week 60	2/26/2018	1758	80%	111	69	738	12.8	138,635	2.089	32.15
Week 61	3/5/2018	1585	72%	107	69	780	12.7	138,635	2.192	32.52
Week 62	3/12/2018	1721	78%	111	69	844	12.5	138,635	2.315	35.63
Week 63	3/19/2018	1680	76%	109	69	731	12.7	138,635	2.042	30.86
Week 64	3/26/2018	1784	81%	114	69	730	12.5	138,635	2.003	31.65
Week 65	4/2/2018	1069	49%	73	23	1056	13.1	138,635	3.101	31.38
Week 66	4/9/2018	1171	53%	75	23	1037	12.9	138,635	2.980	30.99
Week 67	4/16/2018			Gen. not run						
Week 68	4/23/2018	1164	53%	79	23	1023	12.7	138,635	2.861	31.33
Week 69	4/30/2018	1311	60%	86	46	979	12.9	138,635	2.810	33.50
Week 70	5/7/2018			Gen. not run						
Week 71	5/14/2018	1154	52%	78	23	1064	13.6	138,635	3.361	36.34
Week 72	5/26/2018	1132	51%	75	23	904	13.3	138,635	2.724	28.33
Week 73	5/28/2018			Gen. not run						
Week 74	6/4/2018	1340	61%	81	46	934	13.1	138,635	2.739	30.76
Week 75	6/11/2018	1446	66%	97	69	892	12.9	138,635	2.544	34.22
Week 76	6/18/2018			Gen. not run						
Week 77	6/25/2018			Gen. not run						
Week 78	7/2/2018			Gen. not run						
Week 79	7/9/2018			Gen. not run						
Week 80	7/16/2018			Gen. not run						
Week 81	7/28/2018	1735	79%	112	173	706	13.1	138,635	2.073	32.19
Week 82	7/30/2018	1246	57%	77	69	791	13.3	138,635	2.374	25.35
Week 83	8/6/2018	1700	77%	109	173	630	13.0	138,635	1.822	27.53
Week 84	8/13/2018	1633	74%	104	164	612	13.0	138,635	1.770	25.52
Week 85	8/20/2018	1752	80%	112	173	578	13.0	138,635	1.674	25.99
Week 86	8/27/2018	1142	52%	76	46	753	13.1	138,635	2.217	23.36
Month 1	9/10/2018	1654	75%	109	138	552	12.7	138,635	1.544	23.33

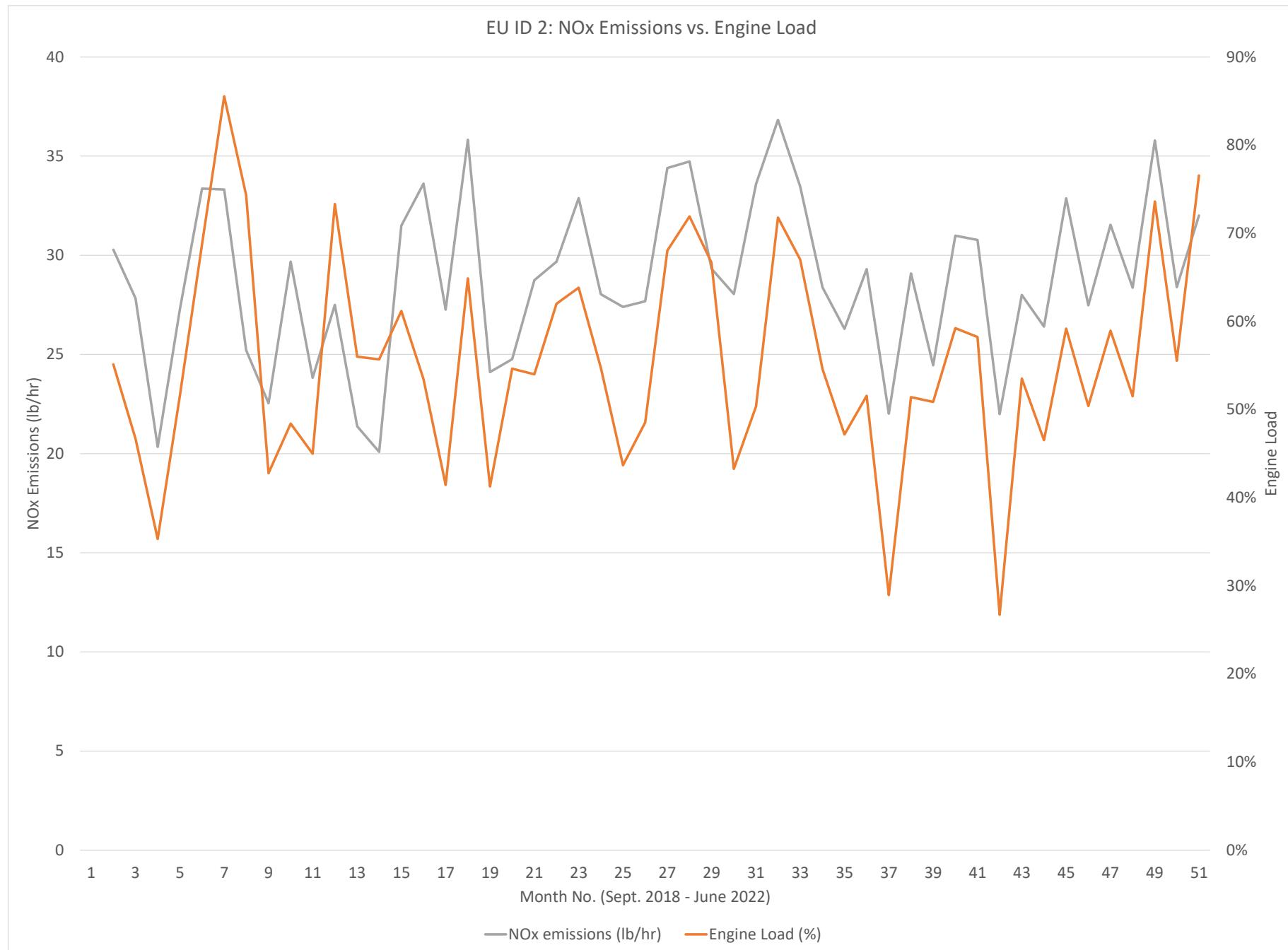
EU ID 3 Testo 350 NOx calculations

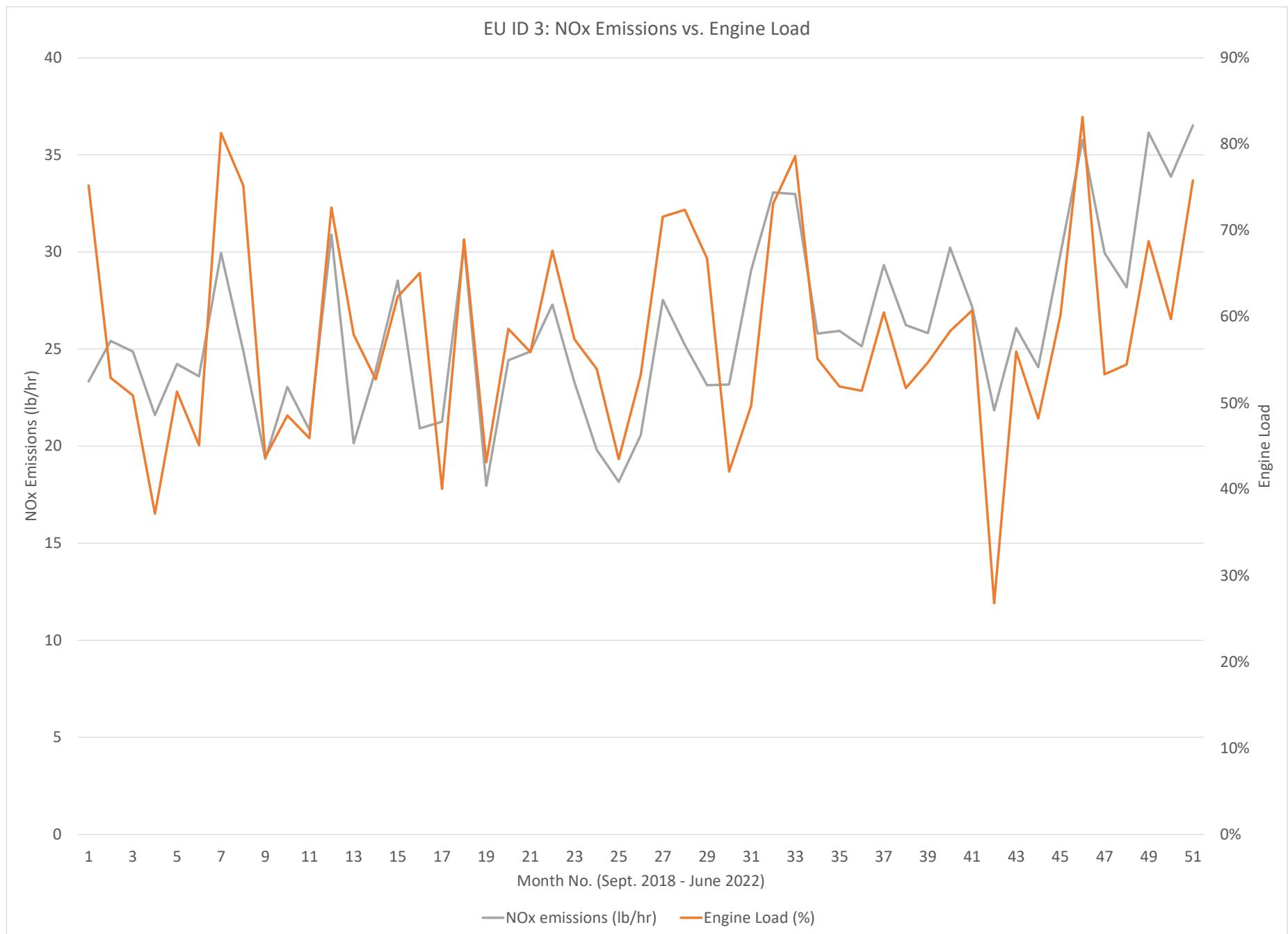
	Date	KW Load	% Load	Fuel Consumption (gal/hr)	Water Consumption (gal/hr)	ppm NOx	Ox%	BTU/Gal	Emis. Rate (E)	Emissions NOx/hr
Month 2	10/9/2018	1164	53%	79	46	846	12.5	138,635	2.321	25.42
Month 3	11/5/2018	1119	51%	70	46	847	13.3	138,635	2.563	24.87
Month 4	12/3/2018	818	37%	56	23	910	13.4	138,635	2.783	21.60
Month 5	1/3/2019	1129	51%	72	46	835	13.0	138,635	2.427	24.23
Month 6	2/3/2019	992	45%	66	23	872	13.2	138,195	2.587	23.60
Month 7	3/3/2019	1788	81%	115	78	681	12.6	138,235	1.884	29.95
Month 8	4/3/2019	1654	75%	109	173	616	12.4	138,266	1.652	24.90
Month 9	5/2/2019	962	44%	62	69	737	13.4	138,266	2.257	19.34
Month 10	6/1/2019	1068	49%	69	23	841	12.9	138,352	2.414	23.04
Month 11	6/27/2019	1010	46%	67	23	784	12.9	138,352	2.247	20.83
Month 12	7/24/2019	1598	73%	106	138	796	12.2	138,523	2.103	30.88
Month 13	8/22/2019	1274	58%	84	69	637	12.5	137,900	1.739	20.15
Month 14	9/21/2019	1160	53%	77	23	869	12.1	137,900	2.252	23.91
Month 15	10/19/2019	1371	62%	92	69	812	12.6	138,523	2.238	28.52
Month 16	11/15/2019	1431	65%	100	69	614	11.6	138,590	1.509	20.92
Month 17	12/21/2019	881	40%	63	23	860	12.8	138,590	2.435	21.26
Month 18	1/19/2020	1517	69%	99	69	784	12.8	137,682	2.228	30.37
Month 19	2/18/2020	949	43%	65	23	856	11.1	137,915	2.003	17.96
Month 20	3/16/2020	1289	59%	80	46	774	12.8	138,579	2.202	24.42
Month 21	4/1/2020	1230	56%	79	46	800	12.8	138,579	2.271	24.86
Month 22	4/29/2020	1488	68%	94	69	760	12.7	136,748	2.123	27.29
Month 23	5/27/2020	1262	57%	85	46	707	12.8	137,539	1.992	23.29
Month 24	6/25/2020	1187	54%	75	46	686	12.7	137,539	1.921	19.81
Month 25	7/24/2020	957	44%	64	23	679	13.3	138,660	2.046	18.16
Month 26	8/12/2020	1172	53%	80	23	714	12.1	138,660	1.854	20.57
Month 27	9/11/2020	1575	72%	106	138	678	12.7	137,610	1.887	27.52
Month 28	10/9/2020	1592	72%	104	138	625	12.8	137,528	1.763	25.22
Month 29	10/29/2020	1468	67%	97.1	69	612.66	12.8	137,528	1.732	23.14
Month 30	11/29/2020	925	42%	62.8	23	880.97	13.4	137,528	2.683	23.17

EU ID 3 Testo 350 NOx calculations

ATTACHMENT B
Graphs of NOx Emissions and Engine Load
EU IDs 1-3







ATTACHMENT C
March 2022 Source Test Results
Summary Tables, EU IDs 1-3

2. SUMMARY OF RESULTS

The results of sample runs are presented in Tables 2-1 through 2-4. Calculation spreadsheets are found in Appendix A. Operational data is included in Appendix E. Method 9 Visible Emission Observation Forms are included in Appendix C.

**Table 2-1 Summary of NO_x Emissions
Individual Runs, Boiler 1 (Source ID 4)**

Run	Run Date	Start Time	% Load	%	NOx dppmv	M1-4 NOx lb/ hr	M19 NO _x lb/hr
				Opacity			
1	3/8/2022	1030	25%	0	54.72	0.95	0.60
2		1130			54.75	0.90	0.61
3		1230			53.95	0.92	0.60
AVE					54.47	0.92	0.60
4	3/8/2022	1350	50%	0	51.50	1.13	0.91
5		1450			51.41	1.16	0.91
6		1550			51.35	1.14	0.91
AVE					51.42	1.14	0.91
7	3/9/2022	650	75%	0	57.09	1.33	1.32
8		750			56.73	1.28	1.31
9		850			57.25	1.28	1.33
AVE					57.02	1.30	1.32
10	3/9/2022	1000	100%	0	59.48	1.44	1.57
11		1100			59.51	1.46	1.57
12		1200			59.43	1.44	1.57
AVE					59.47	1.45	1.57

**Table 2-2 Summary of NO_x Emissions
Individual Runs, Generator 2 (Source ID 3)**

Run	Run Date	Start Time	Load kW	% Load	%	NOx dppmv	M1-4 NOx lb/ hr	M19 NO _x lb/hr
					Opacity			
1	3/9/2022	1508	998	50%	15	973.47	28.76	23.92
2		1608	998			964.12	28.07	23.63
3		1708	998			961.60	27.97	23.50
AVE			998			966.40	28.26	23.68
4	3/9/2022	1825	1498	75%	15	911.01	32.56	31.19
5		1925	1498			893.92	34.67	30.68
6		2025	1498			887.98	34.35	30.63
AVE			1498			897.64	33.86	30.83
7	3/10/2022	635	1961	99%	5	847.79	36.94	36.91
8		735	1980			839.07	35.95	36.88
9		835	1974			828.03	35.08	36.30
AVE			1972			838.29	35.99	36.69

**Table 2-3 Summary of NO_x Emissions
Individual Runs, Generator 3 (Source ID 2)**

Run	Run Date	Start Time	Load kW	% Load	% Opacity	NOx	M1-4 NOx	M19 NO _x
						dppmv	lb/ hr	lb/hr
1	3/10/2022	1116	1011	51%	10	948.16	27.68	25.22
2		1216	1011			949.12	28.87	25.19
3		1316	1010			938.48	28.13	24.77
AVE			1011			945.25	28.23	25.06
7	3/10/2022	1810	1511	76%	10	774.56	30.021	28.05
8		1910	1511			771.18	30.039	28.00
9		2010	1511			754.28	28.765	27.21
AVE			1511			766.67	29.61	27.75
4	3/10/2022	1426	2016	101%	10	693.11	33.376	32.35
5		1526	2016			693.16	33.563	32.38
6		1626	2016			695.92	33.248	32.65
AVE			2016			694.07	33.40	32.46

**Table 2-4 Summary of NO_x Emissions
Individual Runs, Generator 4 (Source ID 1)**

Run	Run Date	Start Time	Load kW	% Load	% Opacity	NOx	M1-4 NOx	M19 NO _x
						dppmv	lb/ hr	lb/hr
7	3/12/2022	950	1057	51%	10	857.19	24.388	25.03
8		1050	1015			859.85	24.068	23.88
9		1150	1015			848.22	23.504	23.56
AVE			1029			855.08	23.99	24.16
4	3/11/2022	1718	1528	76%	5	773.40	31.283	28.80
5		1818	1529			768.12	31.084	28.71
6		1918	1501			760.79	30.816	28.28
AVE			1519			767.44	31.06	28.60
1	3/11/2022	1001	1834	92%	5	745.37	33.43	32.67
2		1101	1831			744.85	33.42	32.58
3		1201	1828			738.38	33.15	32.23
AVE			1831			742.86	33.33	32.50