OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
OREGON TITLE V OPERATING PERMIT ADDENDUM NO. 1
Riverbend Landfill Co.

Significant Permit Modification Review Report

BACKGROUND

On 3/5/10, following a public hearing and public notice period, the Department issued a renewal Title V Operating Permit to Riverbend Landfill Co. for its landfill, new landfill gas-to-energy internal combustion engines, and new enclosed flare. The projected emissions for the engines, enclosed flare, and candlestick flare were based on manufacturer estimates of emission factors. The issued renewal permit contained requirements for the company to perform source tests on the engines and enclosed flare to verify the estimated emission factors. The company performed tests in September, 2010 on the engines and enclosed flare, again in April, 2011 on the enclosed flare, and again in September, 2011 on the engines.

DESCRIPTION OF THE MODIFICATIONS

As a result of the source tests conducted under DEQ approved sampling protocols in September, 2010, the PM and PM_{10} emission factors for the engines and flare were determined to be considerably lower than originally estimated by the manufacturers. The following table compares the original emission factors with the emission factors from the source tests.

Emission Source	Original Emission Factor	Revised Emission Factor
Engines	0.15 gram/hp-hr	0.044 gram/hp-hr (5.6 lb/MMcf LFG)
Enclosed Flare	19.1 lb/MMcf LFG	3.1 lb/MMcf LFG

Based on these results, the company requested a revision to the PM and PM_{10} emission factors which are used to calculate actual emissions for these emission sources in a minor modification application which was approved by the Department after EPA review on 11/14/11. Use of the new emission factors will reduce calculated emissions from the facility and no change to the Plant Site Emission Limits for PM or PM_{10} was necessary.

As a result of the source tests conducted in September, 2010 and April, 2011, the SO_2 emission factors for the engines and flare was determined to be considerably higher than originally estimated in the prior permit renewal. This is due to the higher sulfur content (approximately 300 ppm H_2S) of the inlet landfill gas collected by the LFG collection system. The sulfur content of the inlet gas is converted to SO_2 during combustion in the engines and flare. Based on the source test results the emission factor would be 55.6 lb SO_2/MM ft^3 LFG. However, based on more recent inlet gas sulfur sampling at Riverbend and at other landfills, the inlet sulfur content

can vary appreciably in time. In order to be conservative, the company has estimated that the inlet sulfur content could be as high as 590 ppm which equates to 98.2 lb SO_2/MM ft^3 LFG. As shown in the table below either of these values is considerably higher than the values estimated in the permit renewal.

Emission Source	Original Emission Factor	Average Emission Factor from Source Tests	Conservative Emission Factor
Engines	14.7 lb/MMcf LFG	55.6 lb/MMcf LFG	98.2 lb/MMcf LFG
Enclosed Flare	35.5 lb/MMcf LFG	55.6 lb/MMcf LFG	98.2 lb/MMcf LFG

The higher emission factors for SO_2 increases the potential emissions of SO_2 from the facility to somewhere between 116 and 204 tons/year, well above the current PSEL of 39 tons/year, as shown in the table below.

Projected SO_2 Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	55.6 lb/MMcf LFG 98.2 lb/MMcf LFG	2010 & 2011 STs Company Est.	65.8 (116.2)
Six Engines (ENG)	1050 MMcf LFG	55.6 lb/MMcf LFG 98.2 lb/MMcf LFG	2010 & 2011 STs Company Est.	29.2 (51.5)
Tipper (TIP)	2550 hours; 115 hp	0.00205 lb/hp-hr	AP-42 3.3 (10/96)	0.3
AI	---	---	---	1.0
			TOTAL	96.3 (169.0)

Because either of these increases exceeds the Significant Emission Rate (SER) of 40 tons/year, the facility is required to model the ambient impact of the emissions according to OAR 340-222-0041(3)(b)(C) and OAR 340 Division 225. Because the ambient SO_2 standards are both long-term (annual) and short-term (1-hr, 3-hr, and 24-hr), modeling must be conducted for each of these time frames to ensure compliance with the National and Oregon Ambient Air Quality Standards and PSD increments. The company decided to model a worst-case emission level of 204 tons/year (based on the 590 ppm sulfur inlet and also including an additional 34.8 ton/yr contribution from a backup candlestick flare) and the Department is in agreement with this procedure as it will provide the worst-case ambient results to compare with the ambient standards.

Because this is the first permit action involving a public notice since 7/1/11, the modification must also establish a netting basis and PSEL for the newly regulated pollutant $PM_{2.5}$. In addition, because SO_2 is a precursor pollutant for $PM_{2.5}$, an analysis must also be made to see if the combination of direct $PM_{2.5}$ emissions and secondary $PM_{2.5}$ emission formation (from the precursors SO_2 and NO_x) exceeds the SER of 10 tons/year of $PM_{2.5}$ for modeling purposes. The facility initially has a zero netting basis for $PM_{2.5}$ since the netting basis for PM_{10} was zero on 5/1/11 in accordance with OAR 340-200-0020(76)(b)(A). PM_{10} and direct $PM_{2.5}$ emissions from the facility are estimated in the following tables.

Projected PM_{10} Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/yr)
		Rate	Reference	
Unpaved Roads (UPR) – garbage trucks	104,000 VMT/yr	0.0048 lb/VMT	AP-42 13.2.2 (12/03)	0.25
Unpaved Roads (UPR) – on-site vehicles	78,710 VMT/yr	0.0043 lb/VMT	AP-42 13.2.2 (12/03)	0.17
Paved Roads (PIR) – garbage trucks	13,000 VMT/yr	0.098 lb/VMT	AP-42 13.2.1 (12/03)	0.64
Enclosed Flare (FLRN)	2365.2 MM ft^3 LFG/yr	3.1 lb/MM ft^3 LFG	2011 ST	3.67
Six Engines (ENG)	1050 MM ft^3 LFG/yr	5.6 lb/MM ft^3 LFG	2010 & 2011 STs	2.94
Tipper	2550 hours/yr; 115 hp	0.0022 lb/hp-hr	AP-42 3.3 (10/96)	0.32
AI	---	---	---	1.0
			TOTAL	8.99

Projected Direct $PM_{2.5}$ Emissions

Emission Unit	PM_{10} Emission	Emission Factor		Emissions (tons/yr)
		Rate	Reference	
Unpaved Roads (UPR) – garbage trucks	0.25 tons/yr	10% of PM_{10}	AP-42 Table 13.2.2-3	0.025
Unpaved Roads (UPR) – on-site vehicles	0.17 tons/yr	10% of PM_{10}	AP-42 Table 13.2.2-3	0.017
Paved Roads (PIR) –garbage trucks	0.64 tons/yr	25% of PM_{10}	AP-42 Table 13.2.1-1	0.160
Enclosed Flare (FLRN)	3.67 tons/yr	100% of PM_{10}	2011 ST	3.67
Six Engines (ENG)	2.94 tons/yr	100% of PM_{10}	2010 & 2011 STs	2.94
Tipper	0.32 tons/yr	100% of PM_{10}	DEQ Estimate	0.32
AI	---	---	---	1.0
			TOTAL	8.132

The direct $PM_{2.5}$ PSEL will be set at the generic PSEL level of 9 tons/year, while the PM_{10} PSEL will remain at the generic PSEL level of 14 tons/year.

Because the ambient impacts of $PM_{2.5}$ are tied to both direct $PM_{2.5}$ emissions and emissions of the $PM_{2.5}$ precursors NO_x and SO_2, the company and the Department analyzed whether modeling of $PM_{2.5}$ ambient impacts was required. Based on conversations with EPA Region 10 modeling staff, the Department converted the NO_x and SO_2 emissions from the emission units at the facility based upon the theoretical conversion of these precursors to $PM_{2.5}$ at downwind receptors. These conversion rates are one ton of $PM_{2.5}$ for 40 tons of SO_2 and one ton of $PM_{2.5}$ for 100 tons of NO_x. This calculation also included the worst-case contribution from a backup candlestick flare, although the unit would not normally be operated. As shown in the table below when both the direct $PM_{2.5}$ and the precursor $PM_{2.5}$ contributions are added together, the total $PM_{2.5}$ exceeds the Significant Emission Rate for $PM_{2.5}$. Modeling for $PM_{2.5}$ impacts is therefore required.

Total $PM_{2.5}$ for Modeling

Emission Unit	Direct $PM_{2.5}$ Emission (T/Y)	Precursor $PM_{2.5}$			
		SO_2 (T/Y)	Converted To $PM_{2.5}$ (T/Y)	NO_x (T/Y)	Converted To $PM_{2.5}$ (T/Y)
Unpaved Roads (UPR) –garbage trucks	0.025	---	---	---	---
Unpaved Roads (UPR) – on-site vehicles	0.017	---	---	---	---
Paved Roads (PIR) – garbage trucks	0.160	---	---	---	---
Enclosed Flare (FLRN)	3.67	116.2	2.91	63.4	0.63
Candlestick Flare (CFLR)	1.10	34.8	0.87	13.3	0.13
Six Engines (ENG)	2.94	51.5	1.29	96.4	0.96
Tipper	0.32	0.3	0.01	4.5	0.05
AI	1.0	1.0	0.03	1.0	0.01
Total	9.23	---	5.47	---	1.78
		Grand Total	16.48		

The Department provided the company with a list of competing sources of SO_2 and $PM_{2.5}$ emissions for the modeling effort, as well as the stack characteristics for those sources. The Department also provided background values for SO_2 and $PM_{2.5}$ to be added to the modeling results when comparing impacts to the ambient standards.

The results of the SO_2 and $PM_{2.5}$ air quality modeling analysis (which used the worst-case SO_2 and $PM_{2.5}$ emissions), which were reviewed and approved by Department technical staff, indicate that the proposed SO_2 and $PM_{2.5}$ emissions will not contribute to any exceedance of any ambient

air quality standards within the areas potentially influenced by the engines or flares. Details of the air quality analysis and the Department's review can be found in Appendix B to this review report.

Because of the increased H_2S concentrations being measured in the landfill gas at the facility and with the use of 300 ppm S as an average inlet value to the engines and flare, the Department has revised the estimate of potential H_2S emissions from the facility as shown in the table below. The 300 ppm level is believed by the Department to represent the more long term sulfur level in the landfill gas.

Projected H_2S Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	0.532 lb/MMcf	Company Estimate & AP-42 2.4 (300 ppm @ 98% destruction)	0.63
Six Engines (ENG)	1050 MMcf LFG	2.45 lb/MMcf	Company Estimate & AP-42 2.4 (300 ppm @ 86.1% destruction)	1.29
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	26.2 lb/MMcf	Landfill Air Emissions Model (@300 ppm)	8.01
			TOTAL	9.93

Because the projected H_2S emissions now exceed the de minimis level of 1 ton/year, an H_2S PSEL must be included in the permit. Although the projected emissions are greater than the generic PSEL level (9 tons/year), the company has requested that the generic PSEL level be used in the permit. Because projected emissions are less than the SER, no additional air quality analysis or modeling is required.

CO, NO_x, VOC, and NMOC emissions from both the enclosed flare and the engines were tested in September 2010, April 2011, and September 2011 with lower results than those established in the 3/5/10 Title V permit issuance. In this modification the company has requested an increased flowrate through the enclosed flare. Because of these changes, the Department has also recalculated the CO, NO_x, VOC, and NMOC projected emissions from the facility based on the 2010-2011 source test results for the engines and enclosed flare. Projected CO, NO_x, VOC, and NMOC emissions from the facility are shown in the tables below.

Projected CO Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	19.9 lb/MMcf	2011 ST	23.5
Six Engines (ENG)	1050 MMcf LFG	296.0 lb/MMcf	2010-11 STs	155.4
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	10.3 lb/MMcf	Landfill Air Emissions Model (@141 ppm)	3.1
Tipper (TIP)	2550 hours; 115 hp	0.00668 lb/hp-hr	AP-42 3.3 (10/96)	1.0
AI	---	---	---	1.0
			TOTAL	184.0

Although this value is less than the current PSEL, the company has requested that the Department retain the PSEL at 249 tons/year in case the candlestick flare must be operated. The candlestick flare has a higher emission factor than the enclosed flare and would have larger CO emissions should it be operated in place of the enclosed flare. Because the 249 ton/year PSEL was used in the previous modeling, no additional modeling is required in this permit modification.

Projected NO_x Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	33.8 lb/MMcf	2011 ST	40.0
Six Engines (ENG)	1050 MMcf LFG	154.3 lb/MMcf	2010-11 STs	81.0
Tipper (TIP)	2550 hours; 115 hp	0.031 lb/hp-hr	AP-42 3.3 (10/96)	4.5
AI	---	---	---	1.0
			TOTAL	126.5

Although this value is less than the current PSEL, the company has requested that the Department retain the PSEL at 146 tons/year in case the candlestick flare must be operated. The candlestick flare has a higher emission factor than the enclosed flare and would have larger NO_x emissions should it be operated in place of the enclosed flare. Because the 146 ton/year PSEL

was used in the previous modeling, no additional modeling is required in this permit modification.

Projected VOC Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	2.8 lb/MMcf	2011 ST	3.3
Six Engines (ENG)	1050 MMcf LFG	23.94 lb/MMcf	2010-11 STs	12.6
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	51.9 lb/MMcf	Landfill Air Emissions Model & 39% of NMOC (@232 ppm)	15.9
Tipper (TIP)	2550 hours; 115 hp	0.0025141 lb/hp-hr	AP-42 3.3 (10/96)	0.4
AI	---	---	---	1.0
			TOTAL	33.2

Because the projected VOC emission rate is less than the generic PSEL level, the generic PSEL level of 39 tons/year will be retained in the permit.

Projected NMOC Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	2.8 lb/MMcf	2011 ST	3.3
Six Engines (ENG)	1050 MMcf LFG	23.94 lb/MMcf	2010-11 STs	12.6
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	133.2 lb/MMcf	Landfill Air Emissions Model (@595 ppm)	40.7
Tipper (TIP)	2550 hours; 115 hp	0.0025141 lb/hp-hr	AP-42 3.3 (10/96)	0.4
AI	---	---	---	1.0
			TOTAL	58.0

Because the projected NMOC emission rate is greater than the generic PSEL level (49 tons/year), a source specific PSEL of 58 tons/year will be placed in the permit. Although this value exceeds the SER for NMOCs, there is no ambient standard for NMOCs and additional air quality analysis or modeling is not required.

Under Department rules, any permit modification after July 1, 2011, must consider greenhouse gas emissions (GHGs) and must establish a baseline GHG emission rate and a GHG PSEL if the GHG emissions are greater than the Department's de minimis level of 2756 tons/year. Riverbend Landfill has GHG emissions from the fugitive landfill gas as well as the combusted landfill gas and use of diesel fuel in the tipper. EPA has deferred for permitting purposes all CO_2 GHG emissions from the fugitive landfill gas or the combusted landfill gas for three years. However, the methane (CH_4) and nitrous oxide (N_2O) emissions from these sources is not deferred. The other GHG source which is not deferred is the tipper. The tables below show the baseline GHG emission rate based on calendar year 2010 and the projected GHG emission rate.

Baseline GHG (CO_2e) Emissions (2010) (with biomass deferral)

Emission Unit	Operating Parameter	Emission Factor		Emissions (CO_2e tons/year)
		Rate	Reference	
Enclosed Flare (FLRN), Candlestick Flare (CFLR), and Six Engines (ENG)	1377 MMcf LFG	CH_4 and N_2O only from combustion of LFG	See application spreadsheet	202
Fugitive Landfill Gas (LFG)	3452 ton/yr CH_4	CH_4 only from decomposition	Landfill Generation Model	72,485
Tipper (TIP)	2.354 M gal #2 oil	22,577 lb/M gal	40 CFR Part 98 Subpart C	27
AI	---	----	---	2756
			TOTAL	75,470

The baseline GHG emission rate will be rounded to 75,500 tons/year (68,500 metric tons/year).

Projected GHG (CO_2e) Emissions
(with biomass deferral)

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN) and Six Engines (ENG)	3415.2 MMcf LFG	CH_4 and N_2O only from combustion of LFG	See application spreadsheet	501
Fugitive Landfill Gas (LFG)	4863 ton/yr CH_4 (2021)	CH_4 only from decomposition	Landfill Generation Model	102,126
Tipper (TIP)	2.805 M gal	22,577 lb/M gal	40 CFR Part 98 Subpart C	32
AI	---	---	---	2756
			TOTAL	105,415

The PSEL GHG emission rate will be rounded to 105,400 tons/year (95,600 metric tons/year).

Since the projected GHG emission rate is greater than the generic PSEL level (74,000 tons/year), a source specific GHG PSEL of 105,400 tons/year will be set in this permit action. Because the GHG PSEL increase over the baseline emission rate (29,900 tons/year) is less than the SER for GHGs (75,000 tons/year), there is no further air quality analysis required regarding GHGs.

Because of the increased gas flow rate through the enclosed flare and the possible use of the candlestick flare, the Department has re- estimated the emissions of Hazardous Air Pollutants (HAPs) from the facility. The estimated total HAP emissions for this facility are less than 25 tons/year with no single HAP emission being greater than 10 tons/year. This source is therefore not a major source of hazardous air pollutants. A listing of Hazardous Air Pollutants emitted by this facility is given below:

Pollutant	**Fugitive Landfill Gas (tons/year)**	**Engines (100% load) (tons/year)**	**Flares (100% load) (tons/year)**	**Total (tons/year)**
1,1,1-Trichloroethane	0.31	0.0021	0.0018	0.3139
1,1,2,2-Tetrachloroethane	0.08	0.0011	0.0009	0.0820
1,1,2-Trichloroethane	0.01	---	---	0.0100
1,1-Dichloroethane	0.11	0.0070	0.0059	0.1229
1,1-Dichloroethene	0.01	0.0009	0.0007	0.0116
1,2-Dichloroethane	0.02	0.0011	0.0009	0.0220

Pollutant	Fugitive Landfill Gas (tons/year)	Engines (100% load) (tons/year)	Flares (100% load) (tons/year)	Total (tons/year)
1,2-Dichloropropane	0.01	0.0002	0.0002	0.0104
Acrylonitrile	0.16	0.0004	0.0001	0.1605
Benzene	0.06	0.0144	0.0061	0.0805
Bromodichloromethane	---	0.0049	0.0040	0.0089
Carbon disulfide	0.02	0.0046	0.0019	0.0265
Carbon tetrachloride	Negl.	0.0001	0.00003	0.0001
Carbonyl sulfide	0.01	0.0021	0.0009	0.0130
Chlorobenzene	0.01	0.002	0.0021	0.0145
Chlorodifluoromethane	---	0.0029	0.0025	0.0054
Chloroethane	0.04	0.0015	0.0012	0.0427
Chloroform	Negl.	0.0002	0.0003	0.0005
Chloromethane	0.03	0.0012	0.0010	0.0322
Dichlorobenzene	0.01	0.0225	0.0189	0.0514
Dichloromethane	0.57	0.0275	0.0230	0.6205
Ethylbenzene	0.22	0.1370	0.0576	0.4146
Ethylene dibromide	---	0.0008	0.0007	0.0015
Hexane	0.26	0.0380	0.0160	0.3140
Hydrogen chloride	2.16	2.0900	0.6682	4.9182
Mercury	Negl.	0.0002	0.0003	0.0005
Methyl isobutyl ketone	0.08	0.0142	0.0060	0.1002
Perchlorethylene	0.29	0.0189	0.0090	0.3179
Toluene	1.63	0.4440	0.1872	2.2612
Trichloroethene	0.18	0.0085	0.0071	0.1956
Vinyl chloride	0.22	0.0064	0.0053	0.2317
Xylene	0.58	0.3340	0.1404	1.0544
TOTAL	7.08	3.178	1.170	11.44

Although the facility is not a major source of HAPs, it is still subject to the requirements of 40 CFR Part 63 Subparts AAAA (for municipal solid waste landfills) and ZZZZ (for reciprocating internal combustion engines) because these regulations also cover HAPs from area sources. Under Subpart AAAA, the facility is required to develop and implement a Startup, Shutdown, and Malfunction Plan and this requirement was previously placed in the permit. Under Subpart ZZZZ, the facility must keep daily fuel usage records and submit an annual report. Although these requirements were placed in the previous permit, DEQ is not delegated and has not adopted the Subpart ZZZZ rules.

ADDITIONAL PERMIT CHANGES

Because the generation of sulfur compounds (primarily H_2S) appears to have increased significantly in recent years with no exact cause ascertained at this point, the Department believes that inlet sulfur monitoring should be conducted on a routine basis in order to establish trends in sulfur generation. Therefore, the Department is requiring quarterly inlet sulfur sampling (revised Condition 8.b.) using bag samples, which would be reported in the monthly report required by

Condition 55. This sampling program could also provide information to show the effects of any operational changes that the facility may undertake in the future (such as segregation or diversion of sulfur containing wastes).

The current permit contains Condition 20 that requires the company to collect at least 75% of the theoretical landfill gas generated and includes a table of values that must be collected each year. However, this table was developed in 2009 and the company and the Department both agree that the data is outdated and that a new theoretical landfill gas generation table must be developed based on the most current waste acceptance rates and waste in place at the landfill. The company has revised the landfill generation model and has provided new information which will be placed in a revised table in the permit.

The current permit contains Condition 56 that requires the company to hold semiannual community meetings in April and October of each year to discuss environmental issues at the facility. The October meeting time coincides with a busy time for the wine industry and it has been suggested that the meeting date be moved to November. The Department is in agreement with this request and is taking the opportunity to change the meeting date to November in this permit action.

All references to the old enclosed flare (EU FLRO) are being removed in this permit modification as the unit is no longer operable at the facility.

Condition 16 is being modified to require on additional source test on the new enclosed flare before the end of the current permit term.

Two additional conditions are being added to the permit during this modification to clarify that monitoring and recordkeeping are not required when emission units are not being operated.

Conditions 16.e.ii.(1) and 24.c.i both contain a reference error regarding the test method for measuring visible emissions from the flare or engines and will be corrected to note that Modified EPA Method 9 is to be used.

Condition 14 is being changed to not require reading visible emissions from the flare as no visible emissions have been observed to date and the likelihood of visible emissions is essentially nil when combusting the landfill gas.

The Department has determined that Condition 53.b.xiv. regarding some reporting requirements for the engines is actually not applicable to the engines since the facility is an area source of HAPs. Therefore, this condition will be eliminated from the permit.

Because the Plant Site Emission Limit contributions have changed from the sources at the facility due to the newer emission factors, permit Condition 62 regarding emission fees must also be modified to note the revised emission contributions of the various emission units at the facility for emission fee purposes.

PUBLIC NOTICE

Because of public concerns and interest in the facility, this permit will be placed on public hearing notice from November 16, 2012, to January 11, 2013. The public hearing will be held at the McMinnville Community Center, 600 NE Evans Street, Room 203, McMinnville, Oregon at 7:00 pm on December 19, 2012. An informational session will precede the formal hearing and will begin at 6:00 pm. Comments may also be submitted in writing during the comment period. After the comment period and hearing, the Department will review the comments and modify the permit as may be appropriate according to the Presiding Officer Report. A proposed permit will then be sent to EPA for a 45 day review period.

If the EPA does not object in writing, any person may petition the EPA within 60 days after the expiration of EPA's 45-day review period to make such objection. Any such petition must be based only on objections to the permit that were raised with reasonable specificity during the public comment period provided for in OAR 340-218-0210, unless the petitioner demonstrates that it was impracticable to raise such objections within such period, or unless the grounds for such objection arose after such period.

APPENDIX A

Projected Emissions

Projected PM Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/yr)
		Rate	Reference	
Unpaved Roads (UPR) – garbage trucks	104,000 VMT/yr	0.018 lb/VMT	AP-42 13.2.2 (12/03)	0.94
Unpaved Roads (UPR) – on-site vehicles	78,710 VMT/yr	0.016 lb/VMT	AP-42 13.2.2 (12/03)	0.63
Paved Roads (PIR) – garbage trucks	13,000 VMT/yr	0.501 lb/VMT	AP-42 13.2.1 (12/03)	3.26
Enclosed Flare (FLRN)	2365.2 MM ft^3 LFG/yr	3.1 lb/MM ft^3 LFG	2011 ST	3.67
Six Engines (ENG)	1050 MM ft^3 LFG/yr	5.6 lb/MM ft^3 LFG	2010 & 2011 STs	2.94
Tipper	2550 hours/yr; 115 hp	0.0022 lb/hp-hr	AP-42 3.3 (10/96)	0.32
AI	---	---	---	1.0
			TOTAL	12.76

Projected PM_{10} Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/yr)
		Rate	Reference	
Unpaved Roads (UPR) – garbage trucks	104,000 VMT/yr	0.0048 lb/VMT	AP-42 13.2.2 (12/03)	0.25
Unpaved Roads (UPR) – on-site vehicles	78,710 VMT/yr	0.0043 lb/VMT	AP-42 13.2.2 (12/03)	0.17
Paved Roads (PIR) – garbage trucks	13,000 VMT/yr	0.098 lb/VMT	AP-42 13.2.1 (12/03)	0.64
Enclosed Flare (FLRN)	2365.2 MM ft^3 LFG/yr	3.1 lb/MM ft^3 LFG	2011 ST	3.67
Six Engines (ENG)	1050 MM ft^3 LFG/yr	5.6 lb/MM ft^3 LFG	2010 & 2011 STs	2.94
Tipper	2550 hours/yr; 115 hp	0.0022 lb/hp-hr	AP-42 3.3 (10/96)	0.32
AI	---	---	---	1.0
			TOTAL	8.99

Projected Direct $PM_{2.5}$ Emissions

Emission Unit	PM_{10} Emission	Emission Factor		Emissions (tons/yr)
		Rate	Reference	
Unpaved Roads (UPR) – garbage trucks	0.25 tons/yr	10% of PM_{10}	AP-42 Table 13.2.2-3	0.025
Unpaved Roads (UPR) – on-site vehicles	0.17 tons/yr	10% of PM_{10}	AP-42 Table 13.2.2-3	0.017
Paved Roads (PIR) –garbage trucks	0.64 tons/yr	25% of PM_{10}	AP-42 Table 13.2.1-1	0.160
Enclosed Flare (FLRN)	3.67 tons/yr	100% of PM_{10}	2011 ST	3.67
Six Engines (ENG)	2.94 tons/yr	100% of PM_{10}	2010 & 2011 STs	2.94
Tipper	0.32 tons/yr	!00% of PM_{10}	DEQ Estimate	0.32
AI	---	---	---	1.0
			TOTAL	8.132

Projected SO_2 Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	98.2 lb/MMcf LFG	2010 & 2011 STs	116.2
Six Engines (ENG)	1050 MMcf LFG	98.2 lb/MMcf LFG	2010 & 2011 STs	51.5
Tipper (TIP)	2550 hours; 115 hp	0.00205 lb/hp-hr	AP-42 3.3 (10/96)	0.3
AI	---	---	---	1.0
			TOTAL	169.0

Projected H_2S Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	0.532 lb/MMcf	Company Estimate & AP-42 2.4 (300 ppm @ 98% destruction)	0.63
Six Engines (ENG)	1050 MMcf LFG	2.45 lb/MMcf	Company Estimate & AP-42 2.4 (300 ppm @ 86.1% destruction)	1.29
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	26.2 lb/MMcf	Landfill Air Emissions Model (@300 ppm)	8.01
			TOTAL	9.93

Projected CO Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	19.9 lb/MMcf	2011 ST	23.5
Six Engines (ENG)	1050 MMcf LFG	296.0 lb/MMcf	2010-11 STs	155.4
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	10.3 lb/MMcf	Landfill Air Emissions Model (@141 ppm)	3.1
Tipper (TIP)	2550 hours; 115 hp	0.00668 lb/hp-hr	AP-42 3.3 (10/96)	1.0
AI	---	---	---	1.0
			TOTAL	184.0

Projected NO_x Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	33.8 lb/MMcf	2011 ST	40.0
Six Engines (ENG)	1050 MMcf LFG	154.3 lb/MMcf	2010-11 STs	81.0
Tipper (TIP)	2550 hours; 115 hp	0.031 lb/hp-hr	AP-42 3.3 (10/96)	4.5
AI	---	---	---	1.0
			TOTAL	126.5

Projected VOC Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	2.8 lb/MMcf	2011 ST	3.3
Six Engines (ENG)	1050 MMcf LFG	23.94 lb/MMcf	2010-11 STs	12.6
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	51.9 lb/MMcf	Landfill Air Emissions Model & 39% of NMOC (@232 ppm)	15.9
Tipper (TIP)	2550 hours; 115 hp	0.0025141 lb/hp-hr	AP-42 3.3 (10/96)	0.4
AI	---	---	---	1.0
			TOTAL	33.2

Projected NMOC Emissions

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN)	2365.2 MMcf LFG	2.8 lb/MMcf	2011 ST	3.3
Six Engines (ENG)	1050 MMcf LFG	23.94 lb/MMcf	2010-11 STs	12.6
Fugitive Landfill Gas (LFG)	611.2 MMcf LFG (2021)	133.2 lb/MMcf	Landfill Air Emissions Model (@595 ppm)	40.7
Tipper (TIP)	2550 hours; 115 hp	0.0025141 lb/hp-hr	AP-42 3.3 (10/96)	0.4
AI	---	---	---	1.0
			TOTAL	58.0

Projected GHG (CO_2e) Emissions
(with biomass deferral)

Emission Unit	Operating Parameter	Emission Factor		Emissions (tons/year)
		Rate	Reference	
Enclosed Flare (FLRN) and Six Engines (ENG)	3415.2 MMcf LFG	CH_4 and N_2O only from combustion of LFG	See application spreadsheet	501
Fugitive Landfill Gas (LFG)	4863 ton/yr CH_4 (2021)	CH_4 only from decomposition	Landfill Generation Model	102,126
Tipper (TIP)	2.805 M gal	22,577 lb/M gal	40 CFR Part 98 Subpart C	32
AI	---	---	---	2756
			TOTAL	105,415

The PSEL GHG emission rate will be rounded to 105,400 tons/year (95,600 metric tons/year).

APPENDIX B

Air Quality Analysis and Review

State of Oregon
Department of Environmental Quality Memorandum

To: Gary Andes Feb 15, 2012

From: Svetlana Lazarev

Through: Philip Allen

Subject: McMinnville, OR Riverbend Landfill and Recycling Center Plant Site Emissions Limit Increase

1. Background

Riverbend Landfill and Recycling Center (RLRC) is located three miles west of McMinnville, Oregon. It includes an active landfill that in addition to performing routine landfill and recycling activities operates a landfill gas-to-energy (LFGTE) power plant.

The LFGTE facility consists of six 800 kilowatt electric Landfill Gas (LFG) Internal Combustion Engine generators, a 4,500 scfm enclosed landfill flare, and a utility 1,350 scfm flare. Four out of the six generators have 30 foot tall by 10 inch diameter vertical exhaust stacks. The other two generators have 30 feet tall by 16 inch diameter vertical stacks. The engine generators utilize methane in the LFG to produce electricity used at the facility and will operate 24 hours per day, 7 days per week. The enclosed flare will be used to destroy LFG not utilized by the facility. The utility flare will provide a backup to the enclosed flare. Other sources of SO_2, $PM_{2.5}$, and NO_x at the facility are a diesel tipper and aggregate insignificant sources. Aggregate insignificant sources include cell development and closure activities, portable light plants, trash pumps, a generator, and compressors.

Recent source testing showed higher levels of sulfur in LFG than had been previously thought, with the result that the SO_2 PSEL must be increased. The SO_2 emissions used in this analysis for the new PSEL were calculated using a maximum of 590 ppmv hydrogen sulfide (H_2S) in the collected LFG.

Although the $PM_{2.5}$ PSEL is the sum of direct emissions from facility, for modeling purposes an estimate of secondary formation of $PM_{2.5}$ from SO_2 and NOx emissions must also be made. Currently there is no PSEL for $PM_{2.5}$, and the emissions exceed the Significant Emissions Rate (SER) of 10 tpy. To account for secondary $PM_{2.5}$ formation, one ton of secondary $PM_{2.5}$ is assumed for every 100 tons of NOx and one ton for every 40 tons of SO_2 emitted.

A modeling demonstration for SO_2 and $PM_{2.5}$ was submitted in November 2011. The air quality analysis was performed by SCS Engineers and LNM Consulting.

1. Plant Site Emissions

The proposed facility-wide emissions of SO_2 and $PM_{2.5}$ exceed significant emission rates (SERs) and trigger an Ambient Air Quality Analysis as required by OAR 340-222-0041.

The NOx PSEL is unchanged and NOx modeling is not required. However, since NOx emissions are used to estimate a secondary contribution to $PM_{2.5}$ emissions, they are included in this review.

Table 1
SO_2 Emissions by Emissions Unit

Emissions Unit	Requested SO2	Current PSEL SO2	Increase SO2	SER	Contribution to $PM_{2.5}$
units	tpy	tpy	tpy	tpy	tpy
Engine Generators	51.5				1.3
Enclosed Flare	116.2				2.9
Utility Flare	34.8				0.9
Aggregate Insignificant	1.0				0.0
Tipper	0.3				0.0
Total	203.8	39.0	164.8	40	5.1

Table 2
NO_x Emissions by Emissions Unit

Emissions Unit	Requested NOx	Current PSEL NOx	Increase NOx	SER	Contribution to PM2.5
units	tpy	tpy	tpy	tpy	tpy
Engine Generators	96.4				1.0
Enclosed Flare	63.4				0.6
Utility Flare	13.3				0.1
Aggregate Insignificant	1.0				0.0
Tipper	4.5				0.0
Total	178.6	146.0	32.6	40	1.8

Table 3
$PM_{2.5}$ Emissions by Emissions Unit

Emissions Unit	Requested PM2.5 (direct)	Requested PM2.5 (secondary)	Requested PM2.5 (total)	Current PSEL PM2.5	Increase PM2.5
units	tpy	tpy	tpy	tpy	tpy
Engine Generators	2.9	2.3	5.2	-----	
Enclosed Flare	3.7	3.5	7.2	-----	
Utility Flare	1.1	1.0	2.1	-----	
Aggregate Insignificant	1.0	0.0	1.0	-----	
Tipper	0.3	0.1	0.4	-----	
Total	9.0	6.9	15.9	-----	15.9

SO_2, NO_x, and $PM_{2.5}$ emissions by emissions unit are summarized in Tables 1, 2, and 3 respectively. Maximum SO_2 emissions exceed the current PSEL. $PM_{2.5}$ emissions (direct plus secondary formation) exceed the SER of 10 tpy. Direct $PM_{2.5}$ emissions used in the modeling are expected to become a PSEL. There will be no increase in PSEL for NO_x. The emissions are based on all six engines operating continuously and both flare operating continuously at their maximum ratings.

2. Air Quality Impact Analysis and Results

AERMOD dispersion modeling was competed to demonstrate compliance with the National Ambient Air Quality Standard (NAAQS) and Oregon Ambient Air Quality Standards (QAAQS). AERMOD version 11103 (the current version at the time of the analysis) was run in the regulatory default mode.

Maximum SO_2 and $PM_{2.5}$ impacts were modeled: SO_2 was modeled for the 1hr, 3hr, 24hr, and annual averaging periods, and $PM_{2.5}$ was modeled for the 24-hour and annual averaging periods. The 4th highest-high concentration is reported for the 1-hour SO_2 concentration, consistent with the 99th percentile. The highest 3-hour, 24-hour and annual concentration is reported for those averaging time periods.

Point sources release parameters are presented in Table 4. The tipper and aggregate insignificant (AI) sources were partitioned into three area sources for modeling. Emissions rates are evenly distributed across all three area sources. Area sources release parameters are in Table 5. The LFGTE facility operates continuously, up to 24 hours per day, 7 days per week, and 52 weeks per year, with scheduled and unscheduled shutdowns for maintenance and repair. All six engines typically operate simultaneously. One or both of the flares will operate if the LFGTE facility cannot accommodate all the LFG. For this analysis it is conservatively assumed that the flares also operate continuously at their maximum scfm rating. Other RLRC sources will operate as scheduled, up to the annual hours authorized.

Table 4
Point Sources Release Parameters

Source	Stack Height	Stack Exit Diameter	Stack Exit Temperature	Stack Exit Velocity
units	m	m	K	m/s
Engine Generators	10.11	0.25	733	56.21
Engine Generators	10.11	0.41	733	27.10
Enclosed Flare	12.19	4.02	1,011	6.65
Utility Flare	14.27	1.12	1,273	20.00

Table 5
Area Sources Release Parameters

Source	Length	Width	Angle from North	Release Height
units	m	m		m
	m	m		m
Tipper and AI1	109.0	54.0	0.0	3.0
Tipper and AI2	135.0	48.0	0.0	3.0
Tipper and AI3	176.0	41.0	0.0	3.0

3.1 Building Structures and BPIP-PRIME Dimensions

The Building Profile Input Program (BPIP) model incorporates the PRIME downwash algorithms. Structure downwash was used as part of AERMOD for the modeling of RLRC sources.

3.2 Receptors

To complete air dispersion modeling, a Cartesian receptor grid was developed:

- Discrete property line receptors were spaced 25 meters apart;
- Fine grid receptors were spaced at 50 meter intervals out 500 meters from the RLRC property line. Additional fine grid receptor were spaced at 100 meter intervals out to 2,500 meters;
- Medium grid receptors were spaced at 250 meter intervals from the edge of the fine grid to 5,000 meters from the property line. Additional medium grid receptors were spaced at 500 meter intervals out to 10,000 meters from the property line;
- Coarse grid receptors were spaced at 1,000 meter intervals from the edge of the medium grid out to the edge of the SIA.

Following Oregon Department of Environmental Quality (ODEQ) guidance, all locations with public access were considered ambient air for the purpose of the modeling analyses.

3.3 Meteorological Data

Slightly more than four years of surface meteorological data from the Cascade Steel industrial facility, located approximately 3 km northeast of McMinnville and 8 km northeast of the RLRC, were used when RLRC engine generators were permitted in 2009. These data, along with Salem solar radiation, barometric pressure, and radiosonde data were used to complete the meteorological data requirements for the AERMET meteorological processor for AERMOD. Based on ODEQ guidance, winter conditions were assumed to be the same as autumn. Also per ODEQ guidance, average moisture conditions were assumed for both the meteorological monitoring and project locations.

Although this meteorological data set was still available, in January 2010 an onsite meteorological monitoring station was installed and began operations at RLRC. The meteorological monitoring station was designed and installed to Prevention of Significant Deterioration (PSD) specifications. A complete year of onsite

meteorological data was collected by January 2011. One year of onsite met data from the RLRC station was approved by ODEQ and is used for this modeling study.

3.4 Terrain Data

Terrain hill profiles for the modeling domain were processed with the AERMAP terrain data preprocessor, Version 11053, using USGS 7.5 minute National Elevation Dataset (NED) data. AERMAP locates the height and location of terrain (Height Scale factor) that has the greatest influence on each receptor. Initially, receptor terrain elevations (z coordinates) were assigned based upon the highest elevation of the four NED nodes forming a "box" around each receptor location. As appropriate, elevations of specific receptors were refined using USGS topographical maps or site grading plans.

3.5 Background

Background SO_2 and $PM_{2.5}$ concentration data were required for the NAAQS modeling analysis and include distant anthropogenic and natural sources of emissions. There is no SO_2 or $PM_{2.5}$ monitoring data in the vicinity of McMinnville. SO_2 and $PM_{2.5}$ concentrations measured at DEQ's SE Lafayette site were used as background for this modeling effort and are considered representative (although likely a "worst-case" background) for the RLRC analysis. These data were obtained from the 2010 Oregon Air Quality Data Summaries, June 2011 (http://www.oregon.gov/DEQ). Table 6 shows the background concentrations measured at SE Lafayette at 58th Street, the DEQ monitoring site #10139 and used for the NAAQS analysis. The maximum value for each time period was used.

Table 6
Ambient Background Concentrations

Pollutant untits	Averaging Time	2008 µg/m3	2009 µg/m3	2010 µg/m3
SO_2	1 hour		21.0	
	3 hours	18.2	26.0	20.8
	24 hours	10.4	10.4	8.6
	Annual	2.6	4.2	3.7
$PM_{2.5}$	24 hours	27.0	22.0	17.0
	Annual	8.4	7.6	6.3

3. Standards and Significance Levels

A summary of the applicable Ambient Air Quality Standards and Significant Impact Levels is listed in Table 7.

Table 7
Summary of Ambient Air Quality Standards and Significant Impact Levels

Pollutant	Averaging Period	NAAQS µg/m3	OAAQS µg/m3	Oregon SIL µg/m3	SER tpy
SO_2	1-hour	195	195	8	-----
SO_2	3-hours	1,300	-----	25	-----
SO_2	24-hours	365	260	5	-----
SO_2	Annual	80	53	1	40
$PM_{2.5}$	24-hours	35	35	0	-----
$PM_{2.5}$	Annual	15	15	1	10

Although Oregon has not yet formally adopted them, the 1-hour SO_2 values shown under the OAAQS and Oregon SIL above reflect the federal values. Oregon also has a 3-hour SO_2 ambient air quality standard equal to the federal NAAQS.

4. Major New Source Review and Significant Emission Rates

Since dispersion modeling of SO_2 and $PM_{2.5}$ showed that project off-site concentrations exceeded the Significant Impact Levels (SILs), a full impact study was completed, including NAAQS and PSD Increment. In order to assess the maximum potential impact of the PSEL increases, a conservative approach was taken to model both the flare and the LFGTE plant operating at maximum capacity for SO_2 and $PM_{2.5}$.

This full analysis must show that the total modeled impacts plus total Competing NAAQS source impacts plus general background concentrations are less than the NAAQS for all averaging times.

5. Competing Sources

To complete the NAAQS compliance analysis, the SO_2 and $PM_{2.5}$ Potential to Emit (PTE) for each emission source was modeled. Background ambient air concentration and nearby, or competing, sources were also included in the analysis, to the extent that information was available.

A database of nearby competing SO_2 and $PM_{2.5}$ sources was obtained from ODEQ and is presented in Table 8. If not specified by ODEQ, emission rates used for modeling were the highest of (a) actual emissions, (b) potential to emit emission rates, or (c) PSELs.

Where source parameters and locations were not available, locations and stack base elevations were obtained from Google Earth using the facility's street address. Stack parameters were assumed: stack height = 30 meters, stack diameter = 1 meter, exit temperature = 450°K, and stack exit velocity = 20 meters per second. This approach is believed conservative since many of the competing sources with unknown stack parameters are more than 10 km from RLRC and the assumed stack parameters would allow a plume trajectory that could impact within the RLRC Significant Impact Area (SIA).

Table 8
Competing SO2 and PM2.5 Sources*

Source ID	Source Description	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter	SO2	PM2.5
		(m)	(m)	(m)	(m)	(K)	(m/s)	(m)	(g/s)	(g/s)
WLP12	West Lynn Paper Boilers 1&2	529990	5022182	12	40	498	15	3	14.220	
WLP3	West Lynn Paper Boiler 3	530012	5022193	14	40	498	15	3	7.110	
WLPPM	West Lynn Paper Paper Machines	530217	5022417	11	26	340	10	1.3	0.007	
CM1	Covanta Marion Unit 1	434220	5036939	55.5	78.6	435.8	25	1.22	3.164	
CM2	Covanta Marion Unit 2	434220	5036906	55.5	78.6	435.8	24.6	1.22	3.164	
CSOR	Cascade Steel Old Reheat	487032	5008146	45.7	24.4	635.4	12.83	1.9	0.012	0.031
CSNR	Cascade Steel New Reheat	487075	5008170	45.7	17.7	635.4	13.37	1.6	0.020	0.041
CSMSB	Cascade Steel Melt Shop Baghouse	487145	5008175	45.7	19.8	355.4	2.67	10.2	2.146	0.484
CSVP	Cascade Steel Vertical Preheater	487170	5008215	45.7	17.4	810.9	19.59	0.4	0.001	0.001
CSMSR	Cascade Steel Melt Shop Roof	487170	5008215	45.7	17.4	307	3.05	1	0.009	1.171
FLC	Linfield College Boiler	484447	5004972	46.9	30.5	450	8	1.5	0.012	
SPN67	SP Newsprint Boilers 6&7	503058	5014852	50.9	25.9	319.1	2.2	2.4	0.040	0.082
SPN9	SP Newsprint Boiler 9	503058	5014852	50.9	43.3	332.4	19.3	2	5.880	2.898
SPN10	SP Newsprint Boiler 10	503058	5014852	50.9	45.7	423	17.8	2.9	21.530	3.231
SPN12	SP Newsprint Boilers 11&12	503058	5014852	50.9	45.7	421.9	0.5	3.5	0.063	0.384
SPNDB 1	SP Newsprint Duct Burner 1	503058	5014852	50.9	45.7	426.9	1.5	3.5	0.055	0.279
SPNDB 2	SP Newsprint Duct Burner 2	503058	5014852	50.9	45.7	426.9	1.5	3.5	0.055	0.279
DOJ	US Dept of Justice	469468	4992300	72	31	450	10	1	0.095	
BR	Baker Rock	493871	5007736	28	7.6	422	2.3	1	0.012	
TB2	Truitt Bros 2 Boiler	496919	4977779	33.2232	30	450	20	1	0.954	
VFF57	Valley Fresh Foods Crematory	508977	5001727	55.7784	30	450	20	1	0.002	
VFF58	Valley Fresh Foods Crematory	508977	5001727	55.7784	30	450	20	1	0.004	
NP5	Norpac #5 Brooks Boiler	502895	4988458	56.9976	30	450	20	1	0.186	
SFD	Oregon School for the Deaf	497884	4979661	43.8912	30	450	20	1	0.021	
MB	Morse Bros Asphalt Plant	516641	4910516	198.12	30	450	20	1	0.201	
RS	Rainsweet	495614	4977166	45.72	30	450	20	1	0.001	
FF	Farnstrom Family Crematory	485040	4966464	52.1208	30	450	20	1	0.066	
TB8	Truitt Bros 8 Boiler	496919	4977779	33.2232	30	450	20	1	0.002	
MF	Meduri Farms Boiler	499363	4979975	41.7576	30	450	20	1	0.034	
PH	Providence Health Boiler	498121	4977313	49.9872	30	450	20	1	0.001	
HLM	Hampton Lumber Mills Boiler	460829	4991993	75.2856	30	450	20	1	1.036	
BC36	Boisie Cascade Boiler	496605	4976082	46.9392	30	450	20	1	0.034	
CON	City of Newberg Boiler	502063	5016271	54.864	30	450	20	1	0.010	
CPPFK	Cascade Pacific Pulp Furnace & Kiln	487476	4914117	83.8	77.6	456	14.4	3.2	8.078	
CPPB1	Cascade Pacific Pulp Boiler 1	487476	4914117	83.8	43.3	430	10.7	2	15.730	
CPPB2	Cascade Pacific Pulp Boiler 2	487476	4914117	83.8	34.8	458	12.6	1.7	0.012	
CPPSDT	Cascade Pacific Pulp Smelt Dissolving Tank	487476	4914117	83.8	47.3	355	9.2	1.2	0.665	
AP	Cogen	494956	4944781	52	45.7	420.2	15.6	3	5.034	
UFP	Universal Forest Products	482673	5003660	44.8	30	450	20	1		0.089
PM	Purina Mills	484321	5004288	47.6	30	450	20	1		0.043
OSM	Oregon Steel Mills	517178	5052156	12.2	30	450	20	1		9.822
CS_PM	Cascade Steel Misc PM	487145	5008175	45.7	30	450	20	1		0.528
SP_PM	SP Newsprint Misc PM	503058	5014852	50.9	30	450	20	1		0.370

*The SO_2 values shown in the table represent direct SO_2 emissions, while the $PM_{2.5}$ emissions represent both direct and secondary formation of $PM_{2.5}$.

6. Modeling Results

Modeling results shown in Table 9 demonstrate that the facility impacts from the proposed PSELs for SO_2 and $PM_{2.}5$ plus competing source impacts satisfy applicable Oregon and federal AAQS.

Table 9
SO_2 and PM2.5 Air Dispersion Modeling Results

Pollutant units	Averaging Period	Concentration µg/m3	Background µg/m3	Total µg/m3	AAQ Standard µg/m3	SIL µg/m3	SIA km
SO_2	1-hour	173.6	21.0	194.6	195.0	7.8	15.6
	3-hours	157.9	26.0	183.9	1,300.0	25.0	1.9
	24-hours	67.7	10.4	78.1	260.0	5.0	2.0
	Annual	12.0	4.2	16.2	53.0	1.0	1.4
$PM_{2.5}$	24-hours	6.8	27.0	33.8	35.0	1.0	0.9
	Annual	1.4	8.4	9.8	15.0	0.2	0.8

Table 10 shows the comparison of modeling results with the Class II PSD Increment.

Table 10.
Comparison of Modeling Results with the Class II PSD Increment

Pollutant units	Averaging Time	Model Result µg/m3	PSD Increment µg/m3
SO_2	3-hours	157.9	512
	24-hours	67.7	91
	Annual	12.0	20
$PM_{2.5}$	24-hours	6.8	9
	Annual	1.4	4

DEQ determined that Class I PSD increment analysis was not required for this modeling effort due to the distance from RLRC to any Class I area being greater than 100 km.

7. Conclusions

Based on the emissions data and modeling results provided in this report by RLRC, the air quality analysis demonstrates that the facility impacts from the proposed PSELs for SO_2 and $PM_{2.5}$ satisfy applicable Oregon and federal AAQS.