WASHINGTON STATE DEPARTMENT OF ECOLOGY
POST OFFICE BOX 47600
OLYMPIA, WASHINGTON 98504-7600

IN THE MATTER OF	**]**	**No. 01-03, First Amendment**
Longview Fibre Company	**]**	**FINAL APPROVAL**
P.O. Box 639	**]**	**OF PREVENTION OF**
Longview, Washington 98632	**]**	**SIGNIFICANT DETERIORATION APPLICATION**

Pursuant to the United States Environmental Protection Agency (EPA) regulations for the Prevention of Significant Deterioration (PSD) set forth in Title 40, Code of Federal Regulations, Part 52 and regulations set forth in the Washington Administrative Code 173-400-141 the Washington Department of Ecology (Ecology) is proposing issuance of PSD 01-03. Based on the permit application from Longview Fibre Company and Ecology's investigative information used in developing the PSD permit, Ecology now finds the following:

FINDINGS

1. Subsequent to finalization of the original permit on February 14, 2002, Longview Fibre discovered the descriptive and typographical errors in the permit text listed below, and requested this administrative amendment:

Amendment item	**Description**
Conditions 1.12 and 1.67: Typo.	Correct numbering sequence.
Conditions 1.26 and 1.94: Recovery furnace 22 TRS/H_2S and Power boiler 20 NO_x emission limits.	Added decimal place (e.g., "3 ppmdv" became "3.0 ppmdv") to achieve consistency with NSPS regulations.
Condition 1.74: Lime kiln 5 TRS/H_2S limit	Correct to 8 ppmdv from the 20 ppmdv shown originally.
Condition 1.95: Fuel consumption limit for Cogeneration unit 23	Correct limit to reflect high heat value of natural gas and operation under cold weather conditions.
Conditions 1.101 thru 1.103: Pre-modification completion plant wide mass emission limits	Inserted to clarify that existing PSD-X81-10A, 2000 Revision and Ecology Order No. DE 00AQIS-704 govern plant wide emission limits until capacity modifications are complete
Condition 1.101 and 1.105: Total production terminology	Substitute and define "total primary production" for "total pulp." The later term is insufficiently clear.

Amendment item	Description
Table note 3, part (2): Define monthly and quarterly source test cycles.	Clarify for non-full time operated emission units in wording consistent with Title V permit.
Table 2, note 3, part (3): Emission sampling from units with more than one stack.	Added Power Boiler 20 to units allowed to monitor unit emissions from the continuous emission monitor on one of the stacks, and allowed for future, similar installations.
Table 2, note 5: Compliance condition	Substituted "compliance … shall be monitored" for "compliance … shall be determined" to achieve consistency with recent EPA Title V enforceability guidance.
Table 2, note 5, part (1)(a): Emission factor calculation	Added VOCs to list of applicable pollutants.
Table 2, note 6, part (1)(c): Emission factor calculation	Deleted TRS/H2S which are not emitted by the referenced emission unit.
Table 2, note 6, part (3): Mass emission calculation for Cogeneration unit 23	Substituted automatic calculation from system instrumentation for manual calculation.
Table note 8, part (3): Plant wide VOC calculation	Detailed calculation procedure to include digesters and cooling tower.

2. Longview Fibre (LFC) qualifies as a major stationary source because it is a kraft pulp mill that has the potential to emit more than 100 tons per year of several pollutants. It is located in an area which has been designated Class II for the purpose of PSD evaluation. The site is within an area that is in attainment for the national ambient air quality standards.

3. LFC is proposing a modification to its Longview, WA kraft pulp and paper mill that will increase paper machine primary production capacity from approximately 3,000 machine dry tons of paper (MDTP) per day to approximately 3,600 MDTP/day, on an annual average basis.

3. LFC submitted a notice of construction (NOC) application to Ecology for the proposed project on November 14, 2000. On December 13 2000, LFC requested an extension to the completeness determination period in order to submit supplementary information. Ecology determined the NOC to be complete on March 6, 2001. A draft approval of the PSD application was released for public comment on October 22, 2001. The comment period was closed December 6, 2001. A summary of Ecology's response to public comment is available in the permanent record for this approval.

4. Ecology issued a Determination of Nonsignificance relative to the State Environmental Policy Act (SEPA) on November 1, 2001. The public comment period ended November 19, 2001. Ecology received no comments.

5. Changes in the emission amounts due to the project and estimated emissions from the plant upon completion of the project are:

Table 1 Emissions Increases		
Pollutant	**Net Change in emissions for PSD applicability[1]** **tons per year**	**Most recent two years actual emissions (1998-99)** **tons per year**
NO_x (nitrogen oxides)	951.5	2,077
CO (carbon monoxide)	3,387.5	3,669
SO_2 (sulfur dioxide)	670	1,215
PM_{10} (particulate matter <10 microns)	372.5	326
VOC (volatile organic compounds)	439	1,235
TRS/ H_2S[2] (total reduced sulfur)	53	210[3]

The proposed modification is expected to result in increased emissions of each of the above criteria pollutants in quantities greater than the significant emission rates (SER) specified in 40 CFR 52.21(b)(23)(i) for Prevention of Significant Deterioration (PSD). Consequently, it is required that each of the above criteria pollutants undergo review under USEPA New Source Review guidance.

6. Best available control technology (BACT) is required for any individual emissions unit that contributes to the emissions increase that necessitated the PSD permit ***and*** that will be modified as part of the proposed project. Best available control technology (BACT) will be used to control VOCs from the paper machines, and NO_x, CO, VOCs, PM_{10}, SO_2, H_2S, and TRS from recovery furnaces (RF) numbers 18 and 19.

   - BACT for the paper machines is use of low-VOC additives.

[1] Net emissions increase for PSD applicability determination is future potential to emit (PTE) minus the average of the most recent two years' actual emissions. LFC's recent levels of actual emissions have been substantially below its current PTE. This has been the result of a combination of operation below maximum plant capacity and achieving better-than-expected control of emissions. Actual emissions increases that will accompany the proposed 20% increase in plant capacity will depend on the plant's operating ratio and ability to maintain its recent quality of emissions control. Consequently, the net increases shown in the table represent a worst anticipated case.

[2] All TRS is assumed to be H2S

[3] No data available for 1998 and 1999. 40 CFR 52.21(b)(21)(iii) provides that allowable emissions may be presumed equivalent to actual emissions in the event actual emissions data are unavailable. Data submitted after the application for this permit modification indicated 18 tons actual TRS emissions for the year 2000.

- BACT for recovery furnaces 18 and 19 for each criteria pollutant is as follows:
- For NO_x: Good combustion practice with an emissions limit of 95 ppm NO_x.
- For CO/VOCs: Good combustion control of flame temperature and excess air. Corresponding emissions limits are 612 tons VOCs per year and 360 lbs. CO /hr. for Recovery Furnace 18 and 1,020 tons VOCs per year and 600 lbs. CO /hr. for Recovery Furnace 19.
- For SO_2 and PM_{10}: LFC will have a federally enforceable limit on emissions of these pollutants representing a 53% reduction for SO_2 and a 20% reduction for PM_{10} from the currently allowed emissions levels. With this new baseline for potential SO_2 and PM_{10}, BACT is no further control application.
- For H_2S and TRS: No further control application is either feasible or economically justifiable.

7. The proposed pollutant increases will not significantly impact air quality attainment under the National Ambient Air Quality Standards:
   - The proposed increases in emissions will not cause an exceedance of the National Ambient Air Quality Standards.
   - The proposed emissions increases are not significant contributors to the modeled increment consumption.
8. None of the toxic air pollutant emission increases gave ambient concentration increases in excess of their corresponding acceptable source impact levels under Chapter 173-460 WAC.
9. Criteria pollutant concentrations related to the proposed emissions increases did not exceed significance levels in any Class I area or the Columbia River Gorge.
10. Visibility will not be significantly impaired in any Class I area or the Columbia River Gorge due to the emissions.
11. Projected deposition of sulfur and nitrogen oxide chemical species on the Class I areas and the Columbia River Gorge is not significant.
12. The proposed pollutant increases will not significantly impact sensitive plant or animal species in any Class I or Class II area.
13. The proposed modifications and production increase will not have a significant effect on the surrounding area's population or economic growth.
14. Ecology finds that all requirements are satisfied for PSD and new source review. Approval of the PSD permit is granted subject to the following conditions.

APPROVAL CONDITIONS

1. **Emissions limits, Monitoring and Reporting Requirements**: Table 2 encompasses Approval Conditions 1.1 through 1.107. The emission limits in Table 2 shall not be exceeded. Monitoring and reporting requirements in Table 2 shall be followed.

2. **Exhaust stack flow correlations**: At least annually, LFC shall update equations for calculation of gas flow from each recovery furnace and lime kiln exhaust stack.

2.1 The equations shall correlate exhaust stack gas flows to process rate from the emissions units (see Appendix 2). The correlation shall be based on linear regression analysis.

2.2 By January 31st of each year, LFC shall submit the updated equations, the data on which they are based, and the regression analyses to Ecology for approval. LFC may submit proposed updates more frequently at its option. An update for an emissions unit shall have occurred only when new data are submitted.

2.3 For emission units operated 6,000 hours or more since the last update, each update shall include at least 24 hours of new data, and drop an equal amount of the oldest data. For emission units operated less than 6,000 hours since the last update, the minimum hours of new data (and dropped oldest data) shall be

(Hours of operation since last update) × 24 ÷ 6,260, rounded to the nearest whole number.

The updated equations shall take effect upon approval from Ecology.

3. **Initial Performance Tests**: Within six months after completion of the respective modifications to Recovery Furnaces 18 and 19 that are subject to this permit, Recovery Furnaces 18 and 19 shall be subjected to initial performance tests.

3.1 LFC is to provide not less than two weeks prior notice to Ecology in writing of the scheduled performance test. Such notification shall include a detailed description of the intended performance test plan(s).

3.2 The performance tests shall include determination of emission concentrations and pounds per ton black liquor solids across Recovery Furnaces 18's and 19's range of operating levels. The lowest operating level during the test shall be not greater than 70% of the respective recovery furnace's "Operating Limit" in Table 2. The highest operating level during the test shall be not less than 90% of the respective recovery furnace's "Operating Limit" in Table 2.

3.3 Following are the relevant pollutants and corresponding test methods:

PM and PM_{10}: Reference Method 5 of 40 CFR, Part 60, Appendix A, or Ecology Method 5 as found in the 'Source Test Manual - Procedures for Compliance Testing', 1983, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM_{10}.

SO_2: Reference Method 6C of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. For SO_2 source tests conducted on a stack with a continuous TRS monitor, the test may be conducted using LFC Source Test Method 201, a modification of Method 6C which uses the TRS monitor in an SO_2 monitoring mode.

CO: Reference Method 10 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology.

NO_x: Reference Method 7 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology.

H_2S/TRS: Reference Method 16 of 40 CFR, Part 60, Appendix A, and measured as H_2S, or an alternative approved by Ecology.

VOCs: Reference Method 25A of 40 CFR, Part 60, Appendix A, and measured as C, or an alternative approved by Ecology.

4. **Paper Machines**: Additives used in the paper-making process on the paper machines shall be "low-VOC". LFC shall annually submit a list of additives used in the paper-making process on the paper machines and identify those that are not "low-VOC."

5. **Stack modifications and replacements**: The exhaust stacks for Power Boilers 12, 13, 16, 17, and 20 and Lime Kilns 1, 2, 3, and 4 shall be modified or replaced. The modified or replaced exhaust stacks shall be designed in such a way that modeled exhaust gas dispersion is equal to or better than that indicated for the originally-proposed design in the modeling reported in the application for this PSD permit. Plans for the stack design must be approved in writing by Ecology prior to initiation of construction of the stack. Construction of the modified or replacement stacks shall be consistent with design.

6. **Alternate compliance test methods**: Ecology may approve alternate compliance test methods that are of equivalent stringency for any air pollutant regulated by this permit.

7. **CEM QA plan**: Ecology may require periodically updating the continuous emission monitoring quality assurance plan submitted to Ecology on July 26, 1991 to be. The updates shall satisfy 40 CFR, Part 60, Appendix F, dated July 1, 1992, or latest revision.

8. **Enforcement**: Any activity that is undertaken by LFC or others, in a manner which is inconsistent with the application and this determination, shall be subject to Ecology enforcement under applicable regulations. Nothing in this determination shall be construed so as to relieve LFC of its obligations under any state, local, or federal laws or regulations.

9. **Reporting**: LFC shall retain copies of all required reports to Ecology for at least five years. CEMS, source test, and process data shall be reported in written form to the Washington Department of Ecology Industrial Section or its authorized representative at least monthly (unless a different testing and reporting schedule has been approved by Ecology). The report shall be submitted in conformance with the time requirements included in Chapter 173-405 WAC, but in no case later than thirty days after the end of the calendar month being reported. The report shall be in a format approved by Ecology that shall include but not be limited to the following:

9.1 Process or control equipment operating parameters.

9.2 For each applicable emission unit, the pollutant concentrations in the units and averaging times of the standard shown in Table 2.

9.3 For each applicable emission unit, total pollutant mass emissions in the units and averaging times of the standard shown in Table 2.

9.4 The duration and nature of any monitor downtime.

9.5 Results of any monitor audits or accuracy checks.

9.6 Results of any stack tests performed since the last report.

10. **Exceedance reporting**: For each occurrence of monitored or measured emissions in excess of the standard the report to the Washington Department of Ecology Industrial Section or its authorized representative shall include the following:

10.1 The time of the occurrence.

10.2 Magnitude of the emission or process parameters excess.

10.3 The duration of the excess.

10.4 The probable cause.

10.5 Corrective actions taken or planned

10.6 Any other agency contacted besides Ecology.

11. **O&M Manuals**: Operating and maintenance manuals for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Copies of the manuals shall be available to Ecology. Emissions that result from a failure to follow the requirements of the manuals may be considered proof that the equipment was not properly operated and maintained.

12. **Post-construction ambient air monitoring**: Within six months of the issuance of this permit, LFC shall submit to Ecology a monitoring plan for PM_{10}. As a minimum, the monitoring plan must satisfy the guidelines in the latest edition of Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) (U.S. Environmental Protection Agency, Research Triangle Park, EPA Publication No. EPA-450/4-87-007, May 1987 or latest revision).

13. **Deadline:** This approval shall become invalid if construction of the project is not commenced within eighteen (18) months after receipt of final approval, or if construction of the facility is discontinued for a period of eighteen (18) months, unless Ecology extends the 18 month period upon a satisfactory showing that an extension is justified, pursuant to 40 CFR 52.21(r)(2) and applicable EPA guidance.

14. **Access** to the source by the US Environmental Protection Agency (EPA), Ecology or local regulatory personnel shall be permitted upon request for the purpose of compliance assurance inspections. Failure to allow access is grounds for revocation of this determination of approval.

Reviewed by

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Bernard Brady, P.E
Environmental Engineer,
Air Quality Program

Approved by

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Mary E. Burg, Program Manager,
Air Quality Program

Table 2 Emissions Limits, Monitoring and Reporting Requirements PSD 01-03								
Condition number	**Applicable units**	**Operating limit (see table note 1)**	**Pollutant**	**Emission Limit (see table note 2)**		**Monitoring and Reporting (see table note 3)**		
				Concentration	**Mass rate (See table notes 5 and 6)**	**Test Method**	**Test frequency**	**Reporting**
1.1	Recovery Furnace 15 (see table note 4)	1,150 TBLS/day	Not applicable	None	None	Report daily BLS production in tons		Monthly (see table note 5)
1.2			PM & PM_{10}	0.033 gr/dscf @ 8% O_2, 1 hr. avg.	182.5 TPY	RM 5	M/Q	
1.3			SO_2	60 ppmdv @ 8% O_2, 3 hr. avg.	365 TPY	RM 6C		
1.4			CO	630 lbs./hr., 8 hr. avg.	2,759 TPY	RM 10	A/M	
1.5			NO_x	95 ppmdv @ 8% O_2, 24 hr. avg.	434 TPY	RM 7		
1.6			TRS/H_2S (assume all TRS is H_2S)	17.5 ppmdv @ 8% O_2, 24 hr. avg.	59 TPY	PS 5	C	
1.7	Recovery Furnace 18 (see table note 4)	1,200 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.8			PM & PM_{10}	0.044 gr/dscf @ 8% O_2, 1 hr. avg.	219 TPY Monthly average See table note 5, ¶ (2)(b)(i)	RM 5	M/Q	
1.9			SO_2	60 ppmdv @ 8% O_2, 3 hr. avg.	202 TPY Monthly average See table note 5, ¶ (2)(b)(i)	PS 2	C	
1.10			CO	360 lbs./hr., 8 hr. avg.	1,577 TPY	RM 10	A/M	
1.11			NO_x	95 ppmdv @ 8% O_2, 24 hr. avg.	452 TPY	RM 7		
1.12			TRS/H_2S (assume all TRS is H_2S)	17.5 ppmdv @ 8% O_2, 24 hr. avg.	62 TPY	PS 5	C	
1.13			VOCs	None	612 TPY	RM 25A	Annually	
1.14	Recovery Furnace 19 (see table note	2,000 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		

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				Concentration	**Mass rate (See table notes 5 and 6)**	**Test Method**	**Test frequency**	**Reporting**
1.15	4)		PM & PM_{10}	0.040 gr/dscf @ 8% O_2, 1 hr. avg.	292 TPY Monthly average See table note 5, ¶ (2)(b)(i)	RM 5	M/Q	
1.16			SO_2	60 ppmdv @ 8% O_2, 3 hr. avg.	301 TPY Monthly average See table note 5, ¶ (2)(b)(i)	PS 2	C	
1.17			CO	600 lbs./hr., 8 hr. avg.	2,628 TPY	RM 10	A/M	
1.18			NO_x	95 ppmdv @ 8% O_2, 24 hr. avg.	753 TPY	RM 7		
1.19			TRS/H_2S (assume all TRS is H_2S)	10.0 ppmdv @ 8% O_2, 24 hr. avg.	59 TPY	PS 5	C	
1.20			VOCs	None	1,020 TPY	RM 25A	Annually	
1.21	Recovery Furnace 22 (see table note 4)	1,950 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.22			PM & PM_{10}	0.027 gr/dscf @ 8% O_2, 1 hr. avg.	256 TPY	RM 5	M/Q	
1.23			SO_2	120 ppmdv @ 8% O_2, 3 hr. avg.	1,291 TPY	PS 2	C	
1.24			CO	300 ppmdv @ 8% O_2, 8 hr. avg.	1,380 TPY	PS 4	C	
1.25			NO_x	95 ppmdv @ 8% O_2, 3 hr. avg.	735 TPY	PS 2	C	
1.26			TRS/H_2S (assume all TRS is H_2S)	3.0 ppmdv @ 8% O_2, 12 hr. avg.	17 TPY	PS 5	C	
1.27	Smelt Dissolving Tank 15	1,150 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.28			PM & PM_{10}	0.12 lbs./TBLS	26 TPY	RM 5	M/Q	
1.29			SO_2	None	12 TPY	RM 6C	A/M	

Table 2
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PSD 01-03

Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6)	Test Method	Test frequency	Reporting
1.30			CO	None	38 TPY	RM 10		
1.31			NO_x	None	7 TPY	RM 7		
1.32			TRS/H_2S (assume all TRS is H_2S)	None	67 TPY	RM 16		
1.33	Smelt Dissolving Tank 18	1,200 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.34			PM & PM_{10}	0.12 lbs./TBLS	26 TPY	RM 5	M/Q	
1.35			SO_2	None	4 TPY	RM 6C	A/M	
1.36			CO	None	40 TPY	RM 10		
1.37			NO_x	None	7 TPY	RM 7		
1.38			TRS/H_2S (assume all TRS is H_2S)	None	67 TPY	RM 16		
1.39	Smelt Dissolving Tank 19	2,000 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.40			PM & PM_{10}	0.12 lbs./TBLS	44 TPY	RM 5	M/Q	
1.41			SO_2	None	16 TPY	RM 6C	A/M	
1.42			CO	None	66 TPY	RM 10		
1.43			NO_x	None	11 TPY	RM 7		
1.44			TRS/H_2S (assume all TRS is H_2S)	None	114 TPY	RM 16		
1.45	Smelt Dissolving Tank 22	1,950 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.46			PM & PM_{10}	0.12 lbs./TBLS	44 TPY	RM 5	M/Q	
1.47			SO_2	None	31 TPY	RM 6C	A/M	
1.48			CO	None	65 TPY	RM 10		
1.49			NO_x	None	11 TPY	RM 7		
1.50			TRS/H_2S (assume all TRS is H_2S)	0.0168 lbs./TBLS	6 TPY	RM 16		

Table 2
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Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6)	Test Method	Test frequency	Reporting
1.51	Lime Kilns 1 and 2	140 tons CaO/day each	Not applicable	None	None	Report daily CaO production in tons.		
1.52			PM & PM_{10}	0.030 gr/dscf @ 10% O_2, 1 hr. avg.	20 TPY, each	RM 5	M/Q	
1.53			SO_2	20 ppmdv @ 10% O_2, 3 hr. avg.	16 TPY, each	RM 6C		
1.54			CO	1,400 ppmdv @ 10% O_2, 8 hr. avg.	339 TPY, each	RM 10	A/M	
1.55			NO_x	340 ppmdv @ 10% O_2, 24 hr. avg.	139 TPY, each	RM 7		
1.56			TRS/H_2S (assume all TRS is H_2S)	20 ppmdv @ 10% O_2, 24 hr. avg.	6 TPY, each	PS 5	C	
1.57	Lime Kiln 3	240 tons CaO/day	Not applicable	None	None	Report daily CaO production in tons.		
1.58			PM & PM_{10}	0.030 gr/dscf @ 10% O_2, 1 hr. avg.	34 TPY	RM 5	M/Q	
1.59			SO_2	20 ppmdv @ 10% O_2, 3 hr. avg.	27 TPY	RM 6C		
1.60			CO	1,400 ppmdv @ 10% O_2, 8 hr. avg.	581 TPY	RM 10	A/M	
1.61			NO_x	340 ppmdv @ 10% O_2, 24 hr. avg.	238 TPY	RM 7		
1.62			TRS/H_2S (assume all TRS is H_2S)	20 ppmdv @ 10% O_2, 24 hr. avg.	10 TPY	PS 5	C	
1.63	Lime Kiln 4	250 tons CaO/day	Not applicable	None	None	Report daily CaO production in tons.		
1.64			PM & PM_{10}	0.030 gr/dscf @ 10% O_2, 1 hr. avg.	35.6 TPY	RM 5	M/Q	
1.65			SO_2	20 ppmdv @ 10% O_2, 3 hr. avg.	28 TPY	RM 6C		

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				Concentration	**Mass rate (See table notes 5 and 6)**	**Test Method**	**Test frequency**	**Reporting**
1.66			CO	1,400 ppmdv @ 10% O_2, 8 hr. avg.	605 TPY	RM 10	A/M	
1.67			NO_x	340 ppmdv @ 10% O_2, 24 hr. avg.	248 TPY	RM 7		
1.68			TRS/H_2S (assume all TRS is H_2S)	20 ppmdv @ 10% O_2, 24 hr. avg.	11 TPY	PS 5	C	
1.69	Lime Kiln 5	325 tons CaO/day	Not applicable	None	None	Report daily CaO production in tons.		
1.70			PM & PM_{10}	When firing natural gas: 0.035 gr/dscf @ 10% O_2, 1 hr. avg.	69 TPY	RM 5	M/Q	
				When firing fuel oil: 0.060 gr/dscf @ 10% O_2, 1 hr. avg.				
1.71			SO_2	20 ppmdv @ 10% O_2, 3 hr. avg.	28 TPY	RM 6C		
1.72			CO	500 ppmdv @ 10% O_2, 8 hr. avg.	282 TPY	PS 4	C	
1.73			NO_x	275 ppmdv @ 10% O_2, 24 hr. avg.	262 TPY	RM 7	A/M	
1.74			TRS/H_2S (assume all TRS is H_2S)	8 ppmdv @ 10% O_2, 12 hr. avg.	6 TPY	PS 5	C	
1.75	Power Boilers 12 and 13	444 MMBtu/hr. fuel application rate, each, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		Monthly (see table note 6)
1.76			PM & PM_{10}	0.048 gr/dscf @ 7% O_2, 1 hr. avg.	186 TPY, each	RM 5	M/Q	

Table 2
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PSD 01-03

Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6)	Test Method	Test frequency	Reporting
1.77			SO_2	100 ppmdv @ 7% O_2, 3 hr. avg.	467 TPY, each	PS 2	C	
1.78			CO	2 lbs./MMBtu fuel application rate, 8 hr. avg.	1,945 TPY, each	RM 10	A/M	
1.79			NO_x	410 ppmdv @ 7% O_2, 24 hr. avg.	1,420 TPY, each	RM 7		
1.80	Power Boiler 16	525 MMBtu/hr. fuel application rate, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.81			PM & PM_{10}	0.1 gr/dscf @ 7% O_2, 1 hr. avg.	475 TPY	RM 5	M/Q	
1.82			SO_2	250 ppmdv @ 7% O2, 3 hr. avg.	1,357 TPY	Fuel sulfur reporting		Monthly by purchase records and vendor's reports
1.83			CO	340 ppmdv @ 7% O_2, 8 hr. avg.	2,300 TPY	RM 10	A/M	Monthly (see table note 6)
1.84			NO_x	410 ppmdv @ 7% O_2, 24 hr. avg.	1,679 TPY	RM 7		
1.85	Power Boiler 17	591 MMBtu/hr. fuel application rate, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.86			PM & PM_{10}	0.1 gr/dscf @ 7% O_2, 1 hr. avg.	511 TPY	RM 5	M/Q	
1.87			SO_2	250 ppmdv @ 7% O2, 3 hr. avg.	1,527 TPY	Fuel sulfur reporting		Monthly by purchase records and vendor's reports

Table 2
Emissions Limits, Monitoring and Reporting Requirements
PSD 01-03

Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6)	Test Method	Test frequency	Reporting
1.88			CO	340 ppmdv @ 7% O_2, 8 hr. avg.	2,589 TPY	RM 10	A/M	Monthly (see table note 6)
1.89			NO_x	410 ppmdv @ 7% O_2, 24 hr. avg.	1,890 TPY	RM 7		
1.90	Power Boiler 20	900 MMBtu/hr. fuel application rate, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.91			PM & PM_{10}	0.048 gr/dscf @ 7% O_2, 1 hr. avg.	365 TPY	RM 5	M/Q	
1.92			SO_2	100 ppmdv @ 7% O2, 3 hr. avg.	946 TPY	PS 2	C	
1.93			CO	340 ppmdv @ 7% O_2, 8 hr. avg.	3,942 TPY	RM 10	A/M	
1.94			NO_x	Gas-fired: 0.20 lbs./MMBtu fuel application rate, 3 hr. avg. Other fuel: 0.30 lbs./MMBtu fuel application rate, 3 hr. avg.	1,183 TPY	PS 2	C	
1.95	Cogen 23	896.6 MMBtus/hr. fuel consumption based on higher heat value, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.96			PM & PM_{10}	0.002 gr/dscf @ 15% O_2, 1 hr. avg.	None	RM 5	Triennielly	

Table 2 Emissions Limits, Monitoring and Reporting Requirements PSD 01-03								
Condition number	**Applicable units**	**Operating limit (see table note 1)**	**Pollutant**	**Emission Limit (see table note 2)**		**Monitoring and Reporting (see table note 3)**		
				Concentration	**Mass rate (See table notes 5 and 6)**	**Test Method**	**Test frequency**	**Reporting**
1.97			SO_2	Only pipeline quality natural gas may be used as fuel.		Fuel sulfur reporting		Monthly by purchase records and vendor's reports
1.98			CO	12 ppmdv @ 15% O_2, 1 hr. avg. except during startup and shutdown.	481 lbs./day except during startup and shutdown	PS 4	C	Monthly (see table note 6). Report startup and shutdown data as separate items from data on normal operations.
				Startup and shutdown: 200 ppmdv @ 15% O_2, 1 hr. avg.	Startup and shutdown: 1. 300 lbs./hr. 2. Not to exceed 3 hrs./day			
1.99			NO_x	7 ppmdv @ 15% O_2, 24 hr. avg.	461 lbs. day	PS 2	C	
1.100			VOCs	None	168 lbs./day	RM 25A	T/M	
1.101	Plant wide: Prior to written certification from LFC that modifications are complete that are necessary to increase production capacity above 3,000 MDT/day.	Total primary production (see (4) under table note 1): 3,000 MDT/day, 12 month rolling average	Not applicable	None	None	See table note 8.		Monthly
1.102			NO_x and CO		Limits specified in PSD-X81-10A, 2000 Revision, Table 1 "Total"			
1.103			PM/PM_{10}, SO_2, TRS/H_2S, and VOCs		Limits specified in Ecology Order No. DE 00AQIS-704, Table 1, "Total"			
1.104	Plant wide: After written certification from LFC that	Kraft pulp: 2,800 MDT/day, 12 month rolling average	Not applicable		None			

Table 2 Emissions Limits, Monitoring and Reporting Requirements PSD 01-03								
Condition number	**Applicable units**	**Operating limit (see table note 1)**	**Pollutant**	**Emission Limit (see table note 2)**		**Monitoring and Reporting (see table note 3)**		
				Concentration	**Mass rate (See table notes 5 and 6)**	**Test Method**	**Test frequency**	**Reporting**
1.105	modifications are complete that are necessary to increase production capacity above 3,000 MDT/day	Total primary production (see (4) under table note 1): 3,600 MDT/day, 12 month rolling average						
1.106			PM & PM_{10}		698.5 TPY			
1.107			SO_2		1,885 TPY			
1.108			CO		7,056.5 TPY			
1.109			NO_x		3,028.5 TPY			
1.110			TRS/H_2S (assume all TRS is H_2S)		263 TPY			
1.111			VOCs		1,674 TPY			
1.112		2.6 million lbs./hr. steam production @ 800 psig @ the main header	Not applicable		None	Report daily maximum steam rate @ the main header, lbs./hr. @ 800 psig		

[1] **Compliance with the operating limit** for each emission unit shall be made by recording and reporting the quantities from number (3), below:

(1) Record the number of hours of operation of the emissions unit since the last report.
(2) Record the total production through the emissions unit since the last report.
(3) Divide the quantity from (2) by the quantity from (1), and multiply by twenty-four to get the average (24 hour) daily production.
(4) Total primary production is the total paper and board saleable product from the paper machines. All trim and cull go back into pulp furnish to the paper machines.
  (a) Record daily total primary production.
  (b) Total for the days since end of the last reporting period.
  (c) Add to annual total in last report.
  (d) Subtract the amount of the corresponding period from the immediately previous year.

[2] **Abbreviations**: ADTP = Air Dry Ton Pulp, gr/dscf = grains per dry standard cubic foot, MDT = Machine dry tons, MMBtu = million Btus, Q = quarterly, ppmdv = parts per million based on dry volume, TPY = tons per year, TBLS = tons black liquor solids

[3] (1) **Test methods** indicated are **abbreviations**. Details are given in **Appendix 1** of this permit.

(2) "**A/M**" means source test is to be performed annually. If any single source exceeds 75% of the limitation, source testing shall be performed monthly (see qualification, below) until 6 consecutive month's tests are below 75% of the limitation, at which time testing may return to an annual schedule.

"**M/Q**" means source test is to be performed monthly (see qualification, below). Source testing may be reduced to quarterly (see qualification, below) if 6 consecutive month's tests are below 75% of the limitation. If any single source exceeds 75% of the limitation, source testing shall revert to monthly until 6 consecutive month's tests are below 75% of the limitation.

"**T/M**" means source test is to be performed triennially. If any single source test exceeds 75% of the limitation, source testing shall be performed monthly (see qualification, below) until 6 consecutive month's tests are below 75% of the limitation, after which source testing may return to triennielly.

Qualification:

"Monthly" test cycle: A source test must be performed in any month wherein the unit was operated more than 216 hours. A source test must be performed prior to the emissions unit having been operated a total of 716 hours since the end of the month of the last source test.

"Quarterly" test cycle: A source test must be performed in any quarter wherein the unit was operated more than 648 hours. A source test must be performed prior to the emissions unit having been operated a total of 2,160 hours since the end of the quarter of the last source test.

"**A**", relative to reporting frequency, means annually

"**C**" means testing is continuous by virtue of the CEM.

"**M**", relative to reporting frequency, means monthly.

"**T**", relative to reporting frequency, means triennially.

(3) **Compliance determination using source testing** shall be as follows:

- During all emissions testing (source testing) runs, the concurrent process rate of the emission unit shall be recorded in units of measurement characteristic of the emission unit, and submitted with the source test data.
- An emissions unit with one stack: The arithmetic mean of three or more runs of at least one hour each in duration. NOTE: Compliance may be demonstrated for the SO_2 emission concentration limit on Lime Kiln 5 and for NO_x and SO_2 emission concentration limits on Power Boiler 20 by applying this three-run protocol on one of its stacks. For other emission units having multiple stacks wherein a CEM for a given pollutant emission concentration has been installed on one of the stacks after the finalization date of this permit, the three-run protocol of this paragraph may be used on the relevant stack if approved by Ecology in writing.
- An emissions unit with two stacks: The arithmetic mean of runs made on both stacks. Two or more runs of at least one hour each in duration must be made on each stack.
- An emissions unit with four stacks: The arithmetic mean of runs made on all stacks. A minimum of one run of at least one hour's duration must be made on each stack.
- Any test runs LFC believes to be invalid due to procedural error may be dropped from the arithmetic mean calculation. Results of such "invalid" runs are to be included in the monthly report with an explanation of the "invalid" determination.

[4] During source tests on all recovery furnaces, primary voltage, primary current, opacity, and spark rate for the electrostatic precipitator shall be recorded for each field once during each source test and the data shall be submitted with the source test data. In addition, secondary voltage end secondary current data shall also be collected once during each source test and submitted along with the other data, when available. The department may modify or waive this requirement.

[5] **Compliance with the mass rate limit** for the recovery furnaces, smelt dissolving tanks, and lime kilns shall be monitored as follows:

(1) **Emission Factor**: Pounds pollutant per ton process quantity for each emissions unit.

(a) **Using source test data**: Use source test data for emissions units and pollutants not having CEMS. From the most recent source test results, convert the emission concentration, corresponding stack gas flow rate and emission unit process rate for each run to the equivalent pounds of pollutant emission per process unit of measurement, such as lbs. SO_2/lb. black liquor solids.

Example 1: {[*source test* ppmdv SO_2] × (10^{-6}) × [*source test* dscfm] × (60 min./hr.) × (64 lb. SO_2)}

÷ [(385 scf SO_2) × (*source test* tons BLS /hr.)] = lbs. SO_2/TBLS

The same equation may be used for CO, NO_x, H_2S/TRS, and VOCs by making the following respective substitutions for the term "64 lb. SO_2:"

28 lb. CO, 46 lb. NO_x, 34 lb. H_2S/TRS, and 12 lb. VOCs as carbon.

Example 2: {[*source test* gr/dscf PM_{10}] × (1b./7,000 gr) × [*source test* dscfm] × (60 min./hr.) ÷ (*source test* tons BLS /hr.)] = lbs. PM_{10}/ TBLS

Example 3, Dry kilns: {[*source test* ppmdv SO_2] × (10^{-6}) × [*source test* dscfm] × (60 min./hr.) × (64 lb. SO_2)}

÷ [(385 scf SO_2) × (*source test* tons CaO /hr.)] = lbs. SO_2/ ton CaO

The equation may be used for CO, NO_x, and H_2S/TRS by making the following respective substitutions for the term "64 lb. SO_2:"

28 lb. CO, 46 lb. NO_x, and 34 lb. H_2S/TRS

Example 4, Dry kilns: {[*source test* gr/dscf PM_{10}] × (1b./7,000 gr) × [*source test* dscfm] × (60 min./hr.) ÷ (*source test* tons CaO/hr.)] = lbs. PM_{10}/ ton CaO

Calculate the arithmetic mean of the source test runs for each pollutant and each emission unit as described in table note 3, above.

(b) **Using CEMS data**: Use CEMS data for applicable emissions units and pollutants.

(i) Determine the average daily process throughput for each emissions unit: Recovery furnaces – tons black liquor solids per hour (TBLS/hr.). Lime kilns – tons calcium oxide per hour (CaO/hr.).

(ii) From each average daily process throughput, calculate the related stack exhaust flow. Use the equations relating process throughput to stack exhaust flow currently approved by Ecology (see **Appendix 2** of this permit).

(iii) Determine the daily average emission concentration for each emissions unit and pollutant having a related CEMS.

(iv) Calculate the emissions factors for the reporting period. The examples in (1)(a), above may be used by substituting the corresponding quantities from (1)(b)(i), (ii), and (iii) for the "*source test*" quantities.

(2) **Tons per year**:

(a) Amount processed through the emissions unit since the closing date of the last report.

(i) For recovery furnaces and smelt dissolving tanks: Determine the total tons BLS processed through the emission unit since the closing date of the last report.

(ii) For the lime kilns: Determine the total tons CaO processed through the emission unit since the closing date of the last report.

(b) For each pollutant and emissions unit, multiply the emission factor from (1) by the quantity processed [(2)(a)(i) for the recovery furnaces and smelt dissolving tanks or (2)(a)(ii) for the lime kilns], and divide by 2,000 lbs./ton. The result should be the tons of each pollutant that have been emitted from each emissions unit since the closing date of the last report.

(i) **Recovery Furnaces 18 and 19**: For **PM & PM_{10} and SO_2 compliance demonstration**, multiply the respective quantity from (2)(b) by a factor sufficient to normalize to one year. . Each such quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance

(ii) **All other emissions units and pollutants**: Add up the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of pollutant emissions for each emissions unit. Each such quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance.

[6] **Compliance with mass rate limits** for the power boilers and Cogen 23:

(1) **Emission Factor**, Pounds pollutant per ton process quantity for each emissions unit: Convert each emission concentration, corresponding stack gas flow rate, and power boiler and Cogen fuel application rate to the equivalent pounds of pollutant emission per million Btu (lb./MMBtu). In the examples below,

(a) If continuous emissions monitoring (CEM) has been installed: Apply the examples in this table note, below. Pollutant "*concentration*" is the average daily concentration. "*Exhaust gas flow*" may be calculated from the appropriate "F-factor(s)" from 40 CFR Part 60, Appendix A, Method 19 if not otherwise known. "*Fuel applied*" is to be determined from the average daily fuel composition. Exclude boiler and Cogen downtime from all calculations.

(b) If CEM data are not available, the pollutant *concentration*, *exhaust gas flow*, and *fuel applied* are from the most recent source test run results. Where source test data are used, apply the examples in this table note, below, to each of the source test runs for each pollutant and each power boiler and Cogen 23. Calculate the arithmetic mean as described in table note 3, above.

(c) For Power Boilers 16 and 17 and Cogen 23, calculate SO_2 emissions (lbs. SO_2/MMBtu) from the purchase records and vendor's reports on fuel sulfur content for the fuel applied during the reporting period.

Example 1: {[SO_2 *concentration* ppmdv] × (10^{-6}) × [*exhaust gas flow* dscfm] × (60 min./hr.) × (64 lb. SO_2)}

÷ [(385 scf SO_2) × (*fuel applied* MMBtu/hr.)] = lbs. SO_2/MMBtu

The equation may be used for CO and NO_x by making the following respective substitutions for the term "64 lb. SO_2:"

28 lb. CO, and 46 lb. NO_x.

Example 2: {[PM_{10} *concentration* gr/dscf] × (1b./7,000 gr) × [*exhaust gas flow* dscfm] × (60 min./hr.) ÷ (*fuel applied* MMBtu/hr.)] = lbs. PM_{10}/ MMBtu

(2) **Tons per year**:

(a) Determine the total fuel applied to each power boiler and Cogen 23 since the closing date of the last report in MMBtu.

(b) For each pollutant and the Cogen and each power boiler, multiply the respective quantities from (1) and (2)(a), and divide by 2,000 lbs./ton. The result should be the tons of each pollutant emitted from the Cogen and each power boiler since the closing date of the last report. Add this quantity to the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of emissions for the Cogen and each power boiler. This quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance.

(3) **Cogen daily and hourly mass emission limits:**

(a) For CO and NO_x, determine the daily mass emissions from the CEMS and sonic stack flow monitoring system.

(b) The high range CO monitor shall be used to determine mass emissions during startup and shutdown.

(c) Find the maximum 24 hour fuel applied to Cogen 23 since the closing date of the last report in MMBtu, excluding startup and shutdown periods.

(d) For VOC daily mass emissions, multiply the respective quantities from (1) and (3)(c). This quantity must be less than the corresponding limit in Table 2 to demonstrate compliance.

[7] Either Power Boiler 12, 13, 16, 17, or 20 must be off-line when Cogen 23 is operating. Four hours of operational overlap is allowed for normal startup and shutdown. Compliance shall be demonstrated from recording charts and operators' logs.

[8] Compliance determination for plant wide limits

(1) Report daily Kraft and total machine dry pulp production in tons. Add sufficient contiguous periods including the current reporting period to give a twelve month total.

(2) For PM & PM_{10}, SO_2, CO, and NO_x: For each pollutant, add the emissions calculated for the period since the close of the last report from the recovery furnaces (15, 18, 19, and 22), the smelt dissolving tanks (15, 18, 19, and 22), the lime kilns (1 through 5), the power boilers (12, 13, 16, 17 , and 20), and Cogen 23 to the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of emissions concluding with the close of the current reporting period.

(3) For VOCs:

(a) Determine the total tons of black liquor solids processed through each recovery furnace and all smelt dissolving tanks for the one year period ending with the close of the reporting period.

(b) Determine the total tons of CaO produced by each lime kiln for the one year period ending with the close of the reporting period.

(c) Determine the average fuel application rate for each power boiler and Cogen 23 (MMBtu/hr.) for the one year period ending with the close of the reporting period. Add them together.

(d) Kraft digesters, brownstock washer, and knotter, Primary black liquor oxidizer, Paper machines, and Cooling tower:

(i) Abbreviations:

B = Batch Kraft digester, MDTP

CT = Cooling tower, MDTP

K1 = #1 Kamyr digester, MDTP

K2 = #2 Kamyr digester, MDTP

M&D = Continuous Kraft digester, MDTP

OxMDTP = Primary black liquor oxidizer, MDTP

PPMP = Primary paper machines, MDTP

(ii) Determine the sum of the tons of black liquor solids processed through recovery furnaces 15, 18, and 19 tanks for the one year period ending with the close of the reporting period.

(iii) Determine the sum of the tons of black liquor solids processed through recovery furnaces 15, 18, 19, and 22 tanks for the one year period ending with the close of the reporting period.

(iv) Divide the number from (i) by the number from (ii).

(v) Determine the production in MDTP from each of K1, K2, B, and M&D tanks for the one year period ending with the close of the reporting period.

(vi) Sum K1 + K2 + B + M&D from (v).

(vii) Multiply the number from (iv) by the number from (vii) to give OxMDTP for the one year period ending with the close of the reporting period.

(viii) Multiply the sum of K1 and K2 from (v) by 0.992 to give the pounds of VOCs for the one year period ending with the close of the reporting period from Kamyr digesters #1 and #2.

(ix) Multiply the sum of B and M&D from (v) by 0.96 and add the product of B times 0.136 to give the pounds of VOCs for the one year period ending with the close of the reporting period from the Batch and Continuous Kraft digesters.

(x) Multiply OxMDTP from (vii) by 0.355 to give the pounds of VOCs for the one year period ending with the close of the reporting period from the Primary black liquor oxidizer.

(xi) Multiply the quantity from (1) by 1.075 to give the pounds of VOCs for the one year period ending with the close of the reporting period from the Primary paper machines and Cooling tower.

(xii) Sum the quantities from (viii), (ix), (x) and (xi) to give the plant wide pounds of VOCs for the one year period ending with the close of the reporting period.

(e) Multiply the quantity from (3)(a) by 0.21 to give the pounds of VOCs during the past twelve months from recovery furnaces and smelt dissolving tanks.

(f) Multiply the quantity from (3)(b) by 0.026 to give the pounds of VOCs during the past twelve months from the lime kilns and related lime recovery equipment.

(g) Multiply the quantity from (3)(c) by 117.4 to give VOCs from the power boilers and Cogen 23.

(h) Add the quantities from (3)(d) through (3)(g), and divide the result by 2,000 to give tons per year (TPY) VOCs, plant wide.

Appendix 1

to PSD 01-03

Test Methods: Abbreviations for the test methods indicated as required in Table 2 of PSD 01-03 are defined as follows:

RM 5 Determination of Particulate Emissions from Stationary Sources

For NSPS sources including Recovery Furnace No. 22, Smelt Dissolving Tank No. 22, Lime Kiln No. 5, and Power boiler No. 20; Reference Method 5 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM10.
For all other sources; Reference Method 5 of 40 CFR, Part 60, Appendix A, or Ecology Method 5 as found in the 'Source Test Manual - Procedures for Compliance Testing', 1983, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM10.

RM 6C Determination of Sulfur Dioxide Emissions from Stationary Sources

Reference Method 6C of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. For SO_2 source tests conducted on a stack with a continuous TRS monitor, the test may be conducted using LFC Source Test Method 201, a modification of Method 6C which uses the TRS monitor in an SO_2 monitoring mode.

RM 7 Determination of Nitrogen Oxide Emissions from Stationary Sources

Reference Method 7 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. LFC Source Test Method ???, which uses a certified portable NOx emission monitor, may be used as an approved test procedure.

RM 10 Determination of Carbon Monoxide Emissions from Stationary Sources

Reference Method 10 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. LFC Source Test Method ???, which uses a certified portable CO emission monitor, may be used as an approved test procedure.

RM 16 Semicontinuous Determination of Sulfur Emissions from Stationary Sources

Reference Method 16 of 40 CFR, Part 60, Appendix A, and measured as H_2S, or an alternative approved by Ecology. LFC Source Test Method 202, which captures gas in a Tedlar bag for analysis, may be used to test smelt dissolving tank TRS emissions.

RM 25A Determination of Total Gaseous Organic Concentration using Flame Ionization analyzer
Reference Method 25A of 40 CFR, Part 60, Appendix A, and measured as C, or an alternative approved by Ecology.

PS 2 Performance Specification 2 of 40 CFR, Part 60, Appendix B, “Specification and Test Procedures for SO_2 and NO_x Continuous Emissions Monitoring Systems in Stationary Sources.”

PS 4 Performance Specification 4 of 40 CFR, Part 60, Appendix B, “Specification and Test Procedures for Carbon Monoxide Continuous Emissions Monitoring Systems in Stationary Sources.”

PS 5 Performance Specification 5 of 40 CFR, Part 60, Appendix B, “Specification and Test Procedures for TRS Continuous Emissions Monitoring Systems in Stationary Sources.”

Appendix 2

to PSD 01-03

Exhaust stack flow correlations:

1. **Recovery Furnaces**: Where exhaust stack flow is not directly measured, for compliance purposed it may be calculated from the following general form.

Exhaust stack flow (dscfm @ 8% O_2) = a + b × (BLS production rate, lb./hr.)

At the time of issuance of this PSD permit and until updated in accordance with Approval Condition 2, the coefficients in the above equation shall be

a = 19,631
b = 1.3758

2. **Lime Kilns**: Exhaust stack flow from lime kilns is the sum of combustion exhaust and carbon dioxide generated by the calcine reaction. Where exhaust stack flow is not directly measured, for compliance purposed it may be calculated from the following general form.

Combustion exhaust flow (dscfm @ 10% O_2) = 1.917♣ × (F-factor♦, dscf/MMBtu)
× (lime kiln economy, Btu/ton CaO)
× CaO production rate, tons/hr.)
÷ (60 min./hr.)

At the time of issuance of this PSD permit and until updated in accordance with Approval Condition 2, the coefficients in the above equation shall be

F-factor = 8,740 dscf/MMBtu
Lime kiln economy = 10×10^6 Btu/ton CaO for lime kilns #1 through #4
6.5×10^6 Btu/ton CaO for lime kiln #5

Calcine exhaust flow (dscfm @ 10% O_2) = 1.917♣ × (13,750♥ dscf @ 10% O_2 per ton CaO)
× CaO production rate, tons/hr.)
÷ (60 min./hr.)

Add Combustion exhaust flow and **Calcine exhaust flow** for **total Lime Kiln exhaust flow**.

♣ This coefficient adjusts to 10% O_2.
♦ From 40 CFR Part 60, Appendix A, Method 19
♥ Assuming ideal gas behavior, and based on the standard calcine reaction products.