

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

IN THE MATTER OF:]	
]	
Cardinal FG Company]	NO. PSD-03-03, Amendment 2
Winlock, Washington]	
Cardinal FG Company]	FINAL APPROVAL
775 Prairie Center Drive, Suite 200]	OF PSD APPLICATION
Eden Prairie, Minnesota 55344]	

This permit action is authorized 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 173-400-700:

FINDINGS

1. In 2005, Cardinal FG Company (Cardinal) installed a 650 ton per day (TPD) flat glass plant in the Napavine Industrial Park. The plant is located near the intersection of Avery Road and Washington State Highway 603. This is about five miles (8 kilometers) south of Chehalis, Washington (approximately N 46° 32' 20", E 122° 56' 10", UTM coordinates: 504804E 5153907N).
2. The original PSD permit was final and effective on January 13, 2005.
3. The first amendment to the original permit became effective on February 14, 2008. The original permit contained terms that required that all compliance tests be run at not less than 90% of the daily glass draw capacity of the facility. Market variations made that economically infeasible. Cardinal accepted a lower operating limit corresponding to an allowed reduction in the required compliance test operating rate. The 90% relationship was retained. That modification effectively decreased allowable facility pollutant emissions from those allowed in the original permit. The amended permit terms allow for the possibility that Cardinal may return to full capacity. If that occurs, allowable pollutant emissions will not exceed those in the original permit. Consequently, that amendment was administrative, and did not require a public comment and review period.
4. For this second amendment, Cardinal is requesting addition of permit conditions to allow an annual maintenance shutdown of the spray drier scrubber and electrostatic precipitator, which treat SO₂ and particulate emissions. Glass furnace emissions will be bypassed for up to five days annually. This annual maintenance period was overlooked during the initial permitting process.
5. Cardinal is located within a Class II area that is currently designated in attainment or unclassified for all national and state air quality standards (NAAQS).

6. The site is 74 kilometers (km) from the nearest Class I Area, Mt. Rainier National Park, and beyond 100 km. but within 200 km. of five other Class I areas (Alpine Lakes Wilderness, Goat Rocks Wilderness, Mt. Adams Wilderness, Mt. Hood Wilderness, and Olympic National Park). The site is 116 km from a Class II park and wilderness area, the Columbia River Gorge National Scenic Area.
7. The site is about 50 km from the Washington–Oregon border.
8. The site is more than 100 km from the U.S.–Canadian border, and is not subject to the United States–Canada or State of Washington–Canada agreements of 1991 and 1992/94, respectively.
9. Elements of the original project subject to this permit consisted of:
 - 9.1 Installing one 650 ton per day (TPD) float glass melting furnace with a capacity of about 200 million British thermal units per hour (MMBtu/hr) heat input using exclusively natural gas as fuel and
 - 9.2 Installing associated raw material handling and finished flat glass processing systems and equipment.
10. This project is subject to New Source Performance Standards (NSPS): 40 CFR 60 Subpart CC, (Standards of Performance for Glass Manufacturing Plants. According to 40 CFR 60.292, Table CC-1, this regulation sets a minimum standard of 0.45 lb particulate matter (front-half, 40 CFR Part 60, Appendix A, Reference Method 5) per ton glass produced (lb PM/T_G). The filterable particulate emission limit imposed in this permit is 0.09 lb PM/T_G).
11. The emissions of all air pollutants from the proposed modification are subject to review under Chapter 173-400 WAC, Chapter 173-460 WAC, and the regulations of the Southwest Clean Air Authority (SWCAA,). Chapter 173-400 WAC includes provision for PSD review (WAC 173-400-700). This permit considers only PSD applicable issues. SWCAA is responsible for all other air quality related notice of construction approval issues.
12. Cardinal has the potential to emit more than 250 tons per year (TPY) each of nitrogen oxides (NO_x) and carbon monoxide (CO). Each is a pollutant that is subject to the federal Clean Air Act (fCAAA). Emissions by Cardinal of more than 250 TPY of any one pollutant that is subject to the fCAAA qualifies Cardinal as a major stationary source as defined in federal regulations 40 CFR Part 52.21(b)(1)(i)(b).
13. The original project's potential to emit regulated pollutants is shown in Table 1. The potential increases in Amendment 2 due to the up to 5-day maintenance shutdown of the spray drier scrubber and ESP are also shown.

Table 1. Emissions From the Original Project and Amendment 2

Pollutant	Original Project			Amendment 2
	Plantwide Emission Rate (tpy)	SER (tpy)	PSD Significant?	Potential Emissions Increase Due to Five Days Bypassed Gas Furnace Emissions (tpy)
NO _x ¹	883	40	Yes	0.0
CO	772	100	Yes	0.0
PM/PM ₁₀ ²	121	15	Yes	1.54
SO ₂	72	40	Yes	4.39
VOC	56	40	Yes	0.0
Sulfuric Acid	6.9	7	No	-
F ₂	2.9	3	No	-
Pb	0.03	0.6	No	-

14. Because Cardinal will be a major stationary source, will have net emissions increases for NO_x, CO, PM/PM₁₀, SO₂, and VOC in excess of each respective PSD-SER, and intends to locate in an area that is in attainment/unclassified for the NAAQS for NO_x, CO, PM/PM₁₀, SO₂, and VOC, the project qualifies as a major new source under federal regulations [40 CFR 52.21(b)(1)(i)(b), 40 CFR 52.21(b)(3)(i)(a), and 40 CFR 52.21(b)(23)(i)]. As a result, the project is subject to PSD review.

15. Best Available Control Technology (BACT) analysis determined that the following technologies are capable of consistently controlling emissions from Cardinal's proposed project below the limits required in this permit:

15.1 For NO_x emissions:

15.1.1 Glass furnace: 3R process

15.1.2 Restriction of suspension of the 3R process operation for furnace maintenance to the months of January, February, March, July, or September in any year.

15.2 For CO emissions from the glass furnace: Good combustion practice

15.3 For PM/PM₁₀ emissions:

15.3.1 Glass furnace: Use of a dry electrostatic precipitator (ESP)

15.3.2 Material handling operations: Fabric baghouses.

15.3.3 ESP may be shut down for up to 5 days per year for routine maintenance.

15.4 For SO₂ emissions:

15.4.1 Glass furnace: Sodium carbonate (Na₂CO₃) neutralization through a spray dryer with capture of the resultant sodium sulfate (Na₂SO₄) by the ESP used for PM/PM₁₀ control,

15.4.2 Annealing Lehr: Collection via ventilation hood and exhaust through the spray dryer/ESP system used for glass furnace emissions, and

15.4.3 Spray Dryer and ESP may be shut down for up to five days per year for routine maintenance.

15.5 For VOC emissions:

15.5.1 Glass furnace: Good combustion practice,

15.5.2 Glass cutting: Limited use of glass cutting lubricant.

16. Allowable emissions will not cause or contribute to air pollution in violation of:

16.1 Any NAAQS;

16.2 NAAQS and PSD increment consumption during normal operation

Pollutant and (Averaging Period)	Modeling Results		Modeling Significance Level		Class I Area Allowable Increment Consumption	Class II Area Allowable Increment Consumption	Monitoring Requirement Threshold	NAAQS
	Class I Area	Class II Area	Class I Area	Class II Area				
NO ₂ (annual)	0.008 (all NO _x as NO ₂)	2.6 (all emission sources) 33.6 (including background)	0.1	1.0	2.5	25	14	100
CO (1-hour)	N/A	651	N/A	2,000	N/A	N/A	None	35,000
CO (8-hour)	N/A	139	N/A	500	N/A	N/A	575	10,000
SO ₂ (3-hour)	0.048	10.4	1.0	25	25	512	None	1,300
SO ₂ (24-hour)	0.012	2.4	0.2	5	5	91	13	365
SO ₂ (annual)	8×10 ⁻⁴	0.3	0.1	1	2	20	None	80
PM ₁₀ (24-hour)	0.016	3.8	0.3	5	10	37	10	150
PM ₁₀ (annual)	0.001	0.5	0.2	1	5	19	None	50

Units are micrograms per cubic meter (µgrams/m³):

16.3 NAAQS and PSD increment consumption during maintenance of the spray drier and ESP for up to five days annually (µgrams/m³):

Pollutant (Averaging Period)	Modeling Significance Level	Modeling Results				NAAQS	WAAQS	Increment consumption	Allowable Increment Consumption
		Project Only	Project and Other Sources	Back-ground	Total				
PM ₁₀ (24-hour)	5	9.0	9.0	37.2	46.2	150	-	9	30
PM _{2.5} (24-hour)	1.2	2.2	1.6	18.6	20.2	35	-	1.6	9 ^a
SO ₂ (24-hour)	5	8.6	63	34	97	365	262	63	91
SO ₂ (3-hour)	25	40.2	236	190	426	1,300	-	236	512
SO ₂ (1-hour) ^b	-	119	506.7	190	696.7	-	1,068		
SO ₂ (1-hour) ^c	-	119	488.9	190	678.5 ^d	-	655		

- The most conservative of the SIL and PM_{2.5} increment options proposed in the September 21, 2007 federal register.
- Not to be exceeded more than once per year.
- Not to be exceeded more than once per seven consecutive days.
- The apparent exceedance of the WAAQS was driven by emissions from a large nearby source, not Cardinal. Additional analysis showed that the Cardinal contribution was less than 0.01 µg/m³ on this day.

17. Allowable emissions will not cause a significant visibility impact in

17.1 The surrounding Class I areas:

17.1.1 Under normal operating conditions, there was one day in the three year modeling period that indicated a visibility impact due to the proposed project that was above the Federal land manager guidance 5% threshold for "concern." The visibility impact for that day was 7.7%. The weather on that day was inclement (15 hours of rain, 100% humidity, and fog all day). Based on the modeling analysis, such an exceedance is most likely to occur in December in the Olympic National Park. Ecology does not consider this a significant impact on the aesthetic quality of Olympic National Park.

17.1.2 For periodic furnace maintenance wherein NO_x emissions are uncontrolled, Cardinal will be restricted to not more than twice in any twelve-month period, and to the months of January, February, March, and September. Visibility modeling indicates that furnace maintenance operation could cause a maximum visibility impact between 5% and 6% on one or two days each year during the allowed time periods on the average. These maximum impacts may affect either Mt. Rainier or Olympic National Parks. Ecology does not consider this a significant impact on the aesthetic quality of the national parks.

17.1.3 Analysis of impacts during maintenance of the spray drier and ESP for up to five days annually indicated no additional concerns to Ecology. The Class I Land Managers were consulted and had no additional concerns either.

17.2 Nearby Class II wilderness and scenic areas: The highest modeled visibility impact indicated degradation of less than 3% for the Columbia River Gorge National Scenic Area. Federal land manager guidance considers this to be below the "concern" threshold.

18. Ambient impact analysis indicates that there will be no significant pollutant deposition on soils and vegetation in the Class I or Class II areas.

18.1 Modeled emissions ambient impact levels are substantially below all secondary NAAQS. This indicates a low likelihood of negative impact on Class II area flora and fauna. No sensitive species have been identified. Note: All secondary NAAQS are the same as the primary NAAQS except for "3-hr average SO₂." The 3-hr average SO₂ NAAQS shown in the table, above, is that secondary NAAQS. There is no primary NAAQS for 3-hr average SO₂.

18.2 The highest modeled deposition of nitrogen and sulfur in the surrounding Class I areas averaged over the three year modeling period is not greater than the "concern" threshold in federal land manager guidance.

19. No significant effect on industrial, commercial, or residential growth in the Napavine, Washington area is anticipated as a result of this project.

20. The Final Environmental Impact Statement (FEIS) was issued by Lewis County on July 14, 2004, and all appeals against the FEIS were denied by the Lewis County Hearings Examiner, Mark C. Scheibmeir, on September 7, 2004 (Order on Hearing Nos. 04-2-001, 04-2-002, and 04-2-003).
21. Appeals against this final permit may be made to the USEPA Administrator pursuant to 40 CFR Part 124.
22. Ecology finds that all requirements for PSD have been satisfied. Approval of the PSD application is granted subject to the following conditions.

APPROVAL CONDITIONS

1. The glass furnace may burn only natural gas as defined in 40 CFR 60.41b.
2. Glass draw (24-hour average basis) will be not greater than 1.11 times the lowest glass draw rate used in the most recent complete set of compliance monitoring tests required in Approval Conditions 7.8, 7.9, 8.4, 11.6, and 11.7.
3. Burnout-maintenance of the glass furnace:
 - 3.1 Shall be conducted no more than twice in any twelve consecutive months.
 - 3.2 Shall not exceed fourteen days for each burnout-maintenance.
 - 3.3 Shall be conducted only during the months of January, February, March, or September.
4. NO_x emissions from the glass furnace:
 - 4.1 Shall not exceed 4,550 pounds per continuous 24-hour period, exclusive of operation during furnace burnout-maintenance
 - 4.2 Shall not exceed 7 pounds NO_x per ton glass draw (lb NO_x/T_G , 24-hour average basis), exclusive of operation during furnace burnout-maintenance,
 - 4.3 Shall not exceed 882.2 tons in any consecutive twelve month period
 - 4.4 During each burnout-maintenance period:
 - 4.4.1 Shall not exceed 8,645 pounds NO_x per continuous 24-hour period.
 - 4.4.2 Shall not exceed 13.3 NO_x/T_G (averaged over each burnout-maintenance period).
 - 4.5 Cardinal will demonstrate initial compliance with Conditions 4.1 and 4.2:
 - 4.5.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will conduct a performance test.

- 4.5.2 The performance test will use a continuous emission monitoring system (CEMS) that measures and records NO_x emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 4.5.3 The CEMS will meet the requirements of Condition 13.
 - 4.5.4 For the performance test,
 - 4.5.4.1 NO_x emissions from the glass furnace are continuously monitored for not less than 24 consecutive furnace operating hours.
 - 4.5.4.1.1 Mass emission rates will be determined using the appropriate procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each test sample.
 - 4.5.4.1.2 An equivalent mass emission rate calculation method may be used as an alternative to Condition 4.5.4.1.1 if approved in advance by Ecology.
 - 4.5.4.2 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity.
 - 4.5.4.3 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 4.5.5 Compliance with Condition 4.1 will be determined by the arithmetic mean of the NO_x emissions data in lb NO_x measured pursuant to Condition 4.5.4.1.
 - 4.5.6 Compliance with Condition 4.2 will be determined by dividing the arithmetic mean of the NO_x emissions data in lb NO_x measured pursuant to Condition 4.5.4.1 by the weight of glass draw in tons measured pursuant to Condition 4.5.4.3, using a continuous 24-hour period of the performance test.
 - 4.5.7 Cardinal will submit a test plan to Ecology and SWCAA for approval at least 30 days prior to initial performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), submittal to SWCAA alone will satisfy this condition.
- 4.6 Cardinal will monitor continuing compliance with Conditions 4.1 and 4.2:
- 4.6.1 Beginning on the date the initial performance test in Condition 4.5 is completed or is required to be complete whichever date comes first.
 - 4.6.2 Emissions during all periods of operation exclusive of burnout-maintenance will be included in monitoring compliance with Conditions 4.1 and 4.2.
 - 4.6.3 Continuous compliance will be monitored by a CEMS that measures and records NO_x emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 4.6.4 The CEMS will meet the requirements of Condition 13.
 - 4.6.5 Continuous compliance will be monitored from the arithmetic mean of each 24-hour period's NO_x emissions data measured pursuant to Condition 4.6.3.

- 4.6.5.1 Mass emission rates will be determined using the appropriate procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each 24-hour period.
- 4.6.5.2 An equivalent mass emission rate calculation method may be used as an alternative to Condition 4.6.5.1 if approved in advance by Ecology.
- 4.6.6 The weight of glass draw is monitored and recorded for each 24-hour period of operation.
- 4.6.7 Compliance with Condition 4.1 will be monitored by the arithmetic mean of the NO_x emissions data in lb NO_x measured pursuant to Condition 4.6.5
- 4.6.8 Compliance with Condition 4.2 will be monitored by dividing the mass of the NO_x emissions measured pursuant to Condition 4.6.5 by the weight of glass draw in tons measured pursuant to Condition 4.6.6 for corresponding periods.
- 4.7 Cardinal will monitor continuing compliance with Condition 4.3:
 - 4.7.1 Total NO_x emissions will be determined for each month after initial startup operation by the continuous emission monitoring system (CEMS) that measures and records NO_x emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 4.7.2 The CEMS will meet the requirements of Condition 13.
 - 4.7.3 Continuous compliance will be monitored by the arithmetic mean of each continuous 12-month period's NO_x emissions data measured pursuant to Condition 4.7.1.
 - 4.7.3.1 Mass emission rates will be determined using the appropriate procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each continuous 12-month period.
 - 4.7.3.2 An equivalent mass emission rate calculation method may be used as an alternative to Condition 4.7.3.1 if approved in advance by Ecology.
- 4.8 Cardinal will demonstrate initial compliance with Conditions 4.4.1 and 4.4.2 during the first burnout-maintenance operation after initial startup:
 - 4.8.1 For the entire run of the first burnout-maintenance operation after initial startup, NO_x emissions will be determined by the continuous emission monitoring system (CEMS) that measures and records NO_x emissions from the glass furnace exhaust stack.
 - 4.8.1.1 The CEMS shall measure and record NO_x emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 4.8.1.2 NO_x mass emissions will be determined using the appropriate procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over the burnout-maintenance period.

- 4.8.1.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 4.8.1.2 if approved in advance by Ecology.
 - 4.8.2 The CEMS will meet the requirements of Condition 13.
 - 4.8.3 The weight of glass draw is monitored and recorded for the entire run of the first burnout-maintenance operation after initial startup.
 - 4.8.4 Initial compliance with Condition 4.4.1 will be determined by the mass of the NO_x emissions measured pursuant to Condition 4.8.1.
 - 4.8.5 Initial compliance with Condition 4.4.2 will be determined by dividing the mass of the NO_x emissions measured pursuant to Condition 4.8.1 by the weight of glass draw in tons measured pursuant to Condition 4.8.3.
 - 4.8.6 Cardinal will notify Ecology and SWCAA not less than 30 days before initiation of burnout-maintenance. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.
- 4.9 Cardinal will monitor continuing compliance with Conditions 4.4.1 and 4.4.2:
- 4.9.1 For the entire run of each burnout-maintenance operation after the first one, NO_x emissions will be determined by the continuous emission monitoring system (CEMS) that measures and records NO_x emissions from the glass furnace exhaust stack.
 - 4.9.1.1 The CEMS shall measure and record NO_x emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 4.9.1.2 NO_x mass emissions will be determined using the appropriate procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each burnout-maintenance period.
 - 4.9.1.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 4.9.1.2 if approved in advance by Ecology.
 - 4.9.2 The CEMS will meet the requirements of Condition 13.
 - 4.9.3 The weight of glass draw is monitored and recorded for the entire run of each burnout-maintenance operation after the first one.
 - 4.9.4 Compliance with Condition 4.4.1 will be monitored by the mass of the NO_x emissions measured pursuant to Condition 4.9.1.
 - 4.9.5 Compliance with Condition 4.4.2 will be monitored by dividing the mass of the NO_x emissions measured pursuant to Condition 4.9.1 by the weight of glass draw in tons measured pursuant to Condition 4.9.3.
 - 4.9.6 Cardinal will notify Ecology and SWCAA not less than 30 days before initiation of burnout-maintenance. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.

5. CO emissions from the glass furnace:

5.1 Cardinal's use of any alternate to the 3R Process™ (excess fuel feed process) for control of NO_x emissions:

5.1.1 Cardinal shall provide written notice of intent to use the alternate control process to Ecology not less than 30 days before implementation.

5.1.2 Within 60 days after implementation, Cardinal shall submit to Ecology an application for an amendment to this permit for appropriate modifications to Conditions 5.2 and 5.3.

5.2 Shall not exceed 432 pounds per hour (lbs/hr) on a one-hour average basis.

5.3 Shall not exceed 6.5 pounds CO per ton glass draw (lb CO/T_G) in any consecutive twelve month period

5.4 Cardinal will demonstrate initial compliance with Condition 5.2:

5.4.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will have a performance test conducted by an independent testing vendor.

5.4.2 The performance test is to coincide with the Relative Accuracy Test Audit required for the CEMS that measures and records CO emissions from the glass furnace exhaust stack.

5.4.3 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity during the performance test.

5.4.4 The weight of glass draw is monitored and recorded for the duration of the performance test.

5.4.5 Compliance will be determined by EPA Reference Method 10.

5.4.5.1 Compliance will be demonstrated from the arithmetic mean of not less than three one-hour test samples.

5.4.5.2 The test method will be modified to use non-dispersive infrared (NDIR) with gas filter correlation.

5.4.5.3 The NDIR must have performance specifications allowing a minimum detectable sensitivity of one ppm_{dv} with accuracy within +/- 0.5 ppm_{dv}.

5.4.5.4 The span and linearity calibration gas concentrations in Method 10 will be appropriate to the CO concentration limits specified in this condition.

5.4.5.5 Equivalent concentration test methods may be used if approved in advance by Ecology.

5.4.5.6 CO mass emissions will be determined using the procedures appropriately adapted from 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over the test period.

- 5.4.5.7 An equivalent mass emission rate calculation method may be used as an alternative to Condition 5.4.5.6 if approved in advance by Ecology.
- 5.4.6 Cardinal will submit a test plan to Ecology and SWCAA for approval at least 30 days prior to initial performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), submittal to SWCAA alone will satisfy this condition.
- 5.5 Cardinal will demonstrate initial compliance with Conditions 5.3:
 - 5.5.1 Within 120 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will determine total CO emissions from the glass furnace exhaust stack for 30 consecutive days based on the corresponding continuous emission monitoring system (CEMS)
 - 5.5.1.1 The CEMS shall measure and record CO emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 5.5.1.2 CO mass emissions will be determined using procedures appropriately adapted from 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over the 30-day test period.
 - 5.5.1.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 5.5.1.2 if approved in advance by Ecology.
 - 5.5.2 The CEMS will meet the requirements of Condition 13.
 - 5.5.3 Cardinal shall monitor and record the weight of glass draw for the 30-day test period.
 - 5.5.4 Initial compliance will be determined for Condition 5.3 by dividing the mass of the CO emissions measured pursuant to Condition 5.5.1 by the weight of glass draw in tons measured pursuant to Condition 5.5.3.
- 5.6 Cardinal will monitor continuing compliance with Condition 5.2:
 - 5.6.1 Beginning on the date the initial performance test in Condition 5.4 is completed or is required to be complete whichever date comes first.
 - 5.6.2 Continuous compliance will be monitored by a CEMS that measures and records CO emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 5.6.3 The CEMS will meet the requirements of Condition 13.
 - 5.6.4 Compliance will be determined from the arithmetic mean of the emissions data.
 - 5.6.4.1 CO mass emissions will be determined using the procedures appropriately adapted from 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 5.6.4.2 An equivalent mass emission rate calculation method may be used as an alternative to Condition 5.6.4.1 if approved in advance by Ecology.
- 5.7 Cardinal will monitor continuing compliance with Condition 5.3:

- 5.7.1 Total CO emissions will be determined for each month after initial startup operation by the continuous emission monitoring system (CEMS) that measures and records CO emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 5.7.1.1 The CEMS shall measure and record CO emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 5.7.1.2 CO mass emissions will be determined using the procedures appropriately adapted from 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 5.7.1.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 5.7.1.2 if approved in advance by Ecology.
- 5.7.2 The CEMS will meet the requirements of Condition 13.
- 5.7.3 Cardinal shall monitor and record the weight of glass draw for each 30-day period after initial startup operation.
- 5.7.4 Compliance will be monitored for Condition 5.3 by
 - 5.7.4.1 Adding the mass of the CO emissions measured pursuant to Condition 5.7.1 to the mass of the CO emissions similarly determined for the preceding eleven months,
 - 5.7.4.2 Adding the weight of glass draw measured pursuant to Condition 5.7.3 to the weight of glass draw similarly determined for the preceding eleven months, and
 - 5.7.4.3 Dividing the result from Condition 5.7.4.1 by the result from Condition 5.7.4.2.
- 6. SO₂ emissions from the glass furnace:
 - 6.1 Shall not exceed 16.3 pounds per hour (lbs/hr) on a 3-hour average basis.
 - 6.2 Shall not exceed 0.6 pounds SO₂ per ton glass draw (lb SO₂/T_G) on a 3-hour average basis.
 - 6.3 Cardinal will demonstrate initial compliance with Conditions 6.1 and 6.2:
 - 6.3.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will have a performance test conducted by an independent testing vendor.
 - 6.3.2 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity during the performance test.
 - 6.3.3 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 6.3.4 Compliance with Condition 6.1 will be determined by EPA Reference Method 6, 6A, or 6C.

- 6.3.4.1 Compliance will be demonstrated from the arithmetic mean of not less than three one-hour test samples.
- 6.3.4.2 An equivalent concentration test method may be used if approved in advance by Ecology.
- 6.3.4.3 SO₂ mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
- 6.3.4.4 An equivalent mass emission rate calculation method may be used as an alternative to Condition 6.3.4.3 if approved in advance by Ecology.
- 6.3.5 Initial compliance will be determined for Condition 6.2 by dividing the mass of the SO₂ emissions measured pursuant to Condition 6.3.4 by the weight of glass draw in tons measured pursuant to Condition 6.3.3.
- 6.3.6 Cardinal will submit a test plan to Ecology and SWCAA for approval at least 30 days prior to initial performance testing.
 - 6.3.6.1 The test shall be scheduled concurrently with the initial compliance demonstration required for filterable PM/PM₁₀ emissions from the glass furnace in Condition 7.6.
 - 6.3.6.2 If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), submittal to SWCAA alone will satisfy this condition.
- 6.4 Cardinal will monitor continuing compliance with Condition 6.1:
 - 6.4.1 Beginning on the date the initial performance test in Condition 6.3 is completed or is required to be complete whichever date comes first.
 - 6.4.2 Continuous compliance will be monitored by a CEMS that measures and records SO₂ emissions from the glass furnace exhaust stack on not less than an hourly average basis.
 - 6.4.3 The CEMS will meet the requirements of Condition 13.
 - 6.4.4 Compliance will be determined from the arithmetic mean of the emissions data.
 - 6.4.4.1 SO₂ mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 6.4.4.2 An equivalent mass emission rate calculation method may be used as an alternative to Condition 6.4.4.1 if approved in advance by Ecology.
- 6.5 Cardinal will monitor continuing compliance with Condition 6.2:
 - 6.5.1 Beginning on the date the initial performance test in Condition 6.3 is completed or is required to be complete whichever date comes first.
 - 6.5.2 Total SO₂ emissions will be determined from the emissions data acquired pursuant to Condition 6.4 for each consecutive 3-hour period.

- 6.5.3 Cardinal shall monitor and record the average weight of glass draw for each consecutive 3-hour period.
 - 6.5.4 Compliance will be monitored for Condition 6.2 by dividing the result from Condition 6.5.2 by the result from Condition 6.5.3.
7. PM/PM₁₀ emissions from the glass furnace:
- 7.1 All PM shall be assumed to be PM₁₀.
 - 7.2 Filterable PM/PM₁₀ emissions shall not exceed 2.44 lbs/hr on a 24-hour average basis.
 - 7.3 Filterable PM/PM₁₀ emissions shall not exceed 0.09 pounds filterable PM/PM₁₀ per ton glass draw (lb PM_F/T_G) on a 24-hour average basis.
 - 7.4 Condensable PM/PM₁₀ emissions shall not exceed 23 lbs/hr on a 24-hour average basis.
 - 7.5 Condensable PM/PM₁₀ emissions shall not exceed 0.85 lb condensable PM/PM₁₀ per ton glass draw (PM_C/T_G) on a 24-hour average basis.
 - 7.6 Cardinal will demonstrate initial compliance with Condition 7.2 and 7.3:
 - 7.6.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will have a performance test conducted by an independent testing vendor.
 - 7.6.2 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity.
 - 7.6.3 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 7.6.4 Compliance with Condition 7.2 will be determined by EPA Reference Method 5.
 - 7.6.4.1 EPA Reference Method 5 will be conducted in the manner prescribed in 40 CFR 60.296(d).
 - 7.6.4.2 Compliance will be demonstrated from the arithmetic mean of not fewer than three test samples each of not less than 100 dry standard cubic feet in volume.
 - 7.6.4.3 An equivalent concentration test method may be used if approved in advance by Ecology.
 - 7.6.4.4 Filterable PM/PM₁₀ mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 7.6.4.5 An equivalent mass emission rate calculation method may be used as an alternative to Condition 7.6.4.4 if approved in advance by Ecology.

- 7.6.5 Initial compliance will be determined for Condition 7.3 by dividing the mass of the filterable PM/PM₁₀ emissions measured pursuant to Condition 7.6.4 by the weight of glass draw in tons measured pursuant to Condition 7.6.3.
- 7.6.6 Cardinal will submit a test plan to Ecology and SWCAA for approval at least 30 days prior to initial performance testing.
 - 7.6.6.1 The test shall be scheduled concurrently with the initial compliance demonstration required for SO₂ emissions from the glass furnace in Condition 6.3.
 - 7.6.6.2 If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), submittal to SWCAA alone will satisfy this condition.
- 7.7 Cardinal will demonstrate initial compliance with Condition 7.4 and 7.5:
 - 7.7.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will conduct a performance test.
 - 7.7.2 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity.
 - 7.7.3 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 7.7.4 Compliance with Condition 7.4 will be determined by the arithmetic mean of not fewer than three test samples using EPA Reference Method 202.
 - 7.7.4.1 An equivalent concentration test method may be used if approved in advance by Ecology.
 - 7.7.4.2 Condensable PM/PM₁₀ mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 7.7.4.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 7.7.4.2 if approved in advance by Ecology.
 - 7.7.5 Initial compliance will be determined for Condition 7.5 by dividing the mass of the condensable PM/PM₁₀ emissions measured pursuant to Condition 7.7.4 by the weight of glass draw in tons measured pursuant to Condition 7.7.3.
 - 7.7.6 Cardinal will submit a test plan to Ecology and SWCAA for approval at least 30 days prior to initial performance testing.
 - 7.7.6.1 The test shall be scheduled concurrently with the initial compliance demonstration required for filterable PM/PM₁₀ emissions from the glass furnace in Condition 7.6
 - 7.7.6.2 If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), submittal to SWCAA alone will satisfy this condition.
- 7.8 Cardinal will monitor continuing compliance with Condition 7.2 and 7.3:

- 7.8.1 Not less than once every twelve months beginning on the date the initial performance test in Condition 7.6 is completed or is required to be complete whichever date comes first.
 - 7.8.2 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 7.8.3 Compliance with Condition 7.2 will be determined by EPA Reference Method 5 or 201.
 - 7.8.3.1 Compliance will be demonstrated from the arithmetic mean of not fewer than three test samples each of not less than 100 dry standard cubic feet in volume.
 - 7.8.3.2 An equivalent test method may be used if approved in advance by Ecology.
 - 7.8.3.3 Filterable PM/PM₁₀ mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 7.8.3.4 An equivalent mass emission rate calculation method may be used as an alternative to Condition 7.8.3.3 if approved in advance by Ecology.
 - 7.8.4 Compliance will be monitored for Condition 7.3 by dividing the mass of the filterable PM/PM₁₀ emissions measured pursuant to Condition 7.8.3 by the weight of glass draw in tons measured pursuant to Condition 7.8.2.
 - 7.8.5 Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.
- 7.9 Cardinal will monitor continuing compliance with Condition 7.4 and 7.5.
- 7.9.1 Not less than once every twelve months beginning on the date the initial performance test in Condition 7.6 is completed or is required to be complete whichever date comes first.
 - 7.9.2 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 7.9.3 Compliance with Condition 7.4 will be determined by the arithmetic mean of not fewer than three test samples using EPA Reference Method 202.
 - 7.9.3.1 An equivalent concentration test method may be used if approved in advance by Ecology.
 - 7.9.3.2 Condensable PM/PM₁₀ mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 7.9.3.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 7.9.3.2 if approved in advance by Ecology.

- 7.9.4 Compliance will be monitored for Condition 7.5 by dividing the mass of the condensable PM/PM₁₀ emissions measured pursuant to Condition 7.9.3 by the weight of glass draw in tons measured pursuant to Condition 7.9.2.
- 7.9.5 Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing.
 - 7.9.5.1 The tests shall be scheduled concurrently with the compliance monitoring tests required for filterable PM/PM₁₀ emissions from the glass furnace in Condition 7.8
 - 7.9.5.2 If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.
- 8. VOC emissions from the glass furnace:
 - 8.1 VOC emissions shall not exceed 2.7 lbs/hr measured as propane on a 1-hour average basis.
 - 8.2 VOC emissions shall not exceed 0.10 pounds VOCs measured as propane per ton glass draw (lb VOC/T_G) on a 24-hour average basis.
 - 8.3 Cardinal will demonstrate initial compliance with Condition 8.1 and 8.2:
 - 8.3.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will have a performance test conducted by an independent testing vendor.
 - 8.3.2 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity.
 - 8.3.3 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 8.3.4 Compliance with Condition 8.1 will be determined by the arithmetic mean of not fewer than three test samples using EPA Reference Method 25, 25A, or 25B.
 - 8.3.4.1 An equivalent concentration test method may be used if approved in advance by Ecology.
 - 8.3.4.2 VOC mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.
 - 8.3.4.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 8.3.4.2 if approved in advance by Ecology.
 - 8.3.5 Compliance will be determined for Condition 8.2 by dividing the mass of the VOC emissions measured pursuant to Condition 8.3.4 by the weight of glass draw in tons measured pursuant to Condition 8.3.3.
 - 8.3.6 Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing. If the conditions of this PSD permit have been

incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.

8.4 Cardinal will monitor continuing compliance with Conditions 8.1 and 8.2.

8.4.1 Beginning on the date the initial performance test in Condition 8.3 is completed or is required to be complete whichever date comes first.

8.4.1.1 Not less than once every twelve months until the initial performance and two consecutive subsequent annual tests demonstrate compliance with Conditions 8.1 and 8.2.

8.4.1.2 Thereafter, not less than once every 36 months unless failure to comply with Conditions 8.1 or 8.2 is demonstrated by testing under the procedure outlined in Conditions 8.4.3 and 8.4.4, respectively.

8.4.1.3 Failure to comply with Conditions 8.1 or 8.2 triggers return to source testing not less than once every twelve months, but may return to not less than once every 36 months if three consecutive subsequent annual tests demonstrate compliance with Conditions 8.1 and 8.2.

8.4.2 The weight of glass draw is monitored and recorded for the duration of the performance test.

8.4.3 Compliance with Condition 8.1 will be determined by the arithmetic mean of not fewer than three test samples using EPA Reference Method 25, 25A, or 25B.

8.4.3.1 Equivalent concentration test methods may be used if approved in advance by Ecology.

8.4.3.2 VOC mass emissions will be determined using the procedures outlined in 40 CFR part 60 Appendix A Method 19, and based on the total heat value of fuel consumed over each operating hour.

8.4.3.3 An equivalent mass emission rate calculation method may be used as an alternative to Condition 8.4.3.2 if approved in advance by Ecology.

8.4.4 Compliance will be monitored for Condition 8.2 by dividing the mass of the VOC emissions measured pursuant to Condition 8.4.3 by the weight of glass draw in tons measured pursuant to Condition 8.4.2.

8.4.5 Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.

9. The spray drier and ESP may be shut down for up to five days annually for routine maintenance with the process emissions they normally treat bypassed.

9.1 SO₂ emission limits in Conditions 6.1 and 6.2, and particulate emissions in Conditions 7.2, 7.3, 7.4, and 7.5 are relieved during this time.

9.2 SO₂ emissions shall not exceed 90 pounds per hour (lbs/hr) on a 3-hour average basis.

- 9.3 SO₂ emissions shall be measured by the SO₂ CEM and counted toward annual emissions.
 - 9.4 PM₁₀ and PM_{2.5} emissions shall be estimated using emission factors used for modeling these emissions or using an alternative emission factor approved by Ecology. Emissions shall be counted toward annual emissions.
10. SO₂ emissions from the lehr:
- 10.1 Cardinal shall use no more than 0.25 pounds of SO₂ per ton glass draw, averaged monthly.
 - 10.2 Cardinal shall draw circulation air through the hood located between the tin bath and lehr at all times of glass production, and route said air to the spray dryer ESP system used for glass furnace emissions.
 - 10.3 SO₂ usage in the lehr shall be measured by maintaining a record of gas cylinder replacement.
 - 10.3.1 Each cylinder shall be weighed prior to and after usage to obtain the pounds of sulfur dioxide used in the process, and the net consumption shall be recorded in a logbook (written or electronic form).
 - 10.3.2 Total monthly consumption of SO₂ in the lehr shall be determined from the data collected pursuant to Condition 10.3.1.
 - 10.3.3 The corresponding total monthly weight of glass draw will be calculated from data collected pursuant to Condition 5.7.3.
 - 10.3.4 Relative SO₂ consumption in the lehr is calculated by dividing the result from Condition 10.3.2 by the result from Condition 10.3.3.
 - 10.4 Cardinal will determine initial compliance with Condition 10.1 by calculating the first full calendar month's SO₂ consumption in the lehr using the method specified in Condition 10.3.
 - 10.5 Beginning with the first full calendar month following the date of startup, Cardinal will monitor compliance with Condition 10.1 by calculating each full calendar month's SO₂ used in the lehr using the method specified in Condition 10.3.
 - 10.6 Cardinal shall monitor compliance with Condition 10.2 by recording all instances and duration wherein the hood located between the tin bath and lehr fans are not operating during glass production.
11. PM/PM₁₀ emissions from the bag houses: Cullet return, elevator bottom, elevator top, and batch mixer.
- 11.1 All PM shall be assumed to be PM₁₀.

11.2 Total PM/PM₁₀ emissions from each bag house exhaust shall not exceed 0.005 gr/dscft @ 20.9 % O₂ on a 24-hour average basis.

11.3 Total PM/PM₁₀ emissions from the cullet return bag house exhaust shall not exceed 1.9 lb/hr on a 24-hour average basis.

11.4 Total PM/PM₁₀ emissions from the elevator bottom, elevator top, and batch mixer bag houses shall not exceed 0.2 lb/hr on a 24-hour average basis.

11.5 Cardinal will demonstrate initial compliance with Conditions 11.2, 11.3 and 11.4:

11.5.1 Within 60 days of achieving the maximum firing rate at which the glass furnace will be operated, but not later than 180 days after initial startup, Cardinal will have a performance test conducted by an independent testing vendor.

11.5.2 The glass furnace is operated at an average glass making rate of not less than 90% of rated capacity.

11.5.3 The weight of glass draw is monitored and recorded for the duration of the performance test.

11.5.4 Compliance with Condition 11.2 will be determined using EPA Reference Methods 5 or 201 for filterable particulate and EPA Reference Methods 202 for condensable particulate.

11.5.4.1 Compliance will be demonstrated from the arithmetic mean of not fewer than three test samples each of not less than 100 dry standard cubic feet in volume.

11.5.4.2 An equivalent concentration test method may be used if approved in advance by Ecology.

11.5.5 Compliance with Conditions 11.3 and 11.4 will be determined from the PM/PM₁₀ concentrations determined for each bag house pursuant to Condition 11.5.4.

11.5.5.1 Each exhaust stack velocity shall be determined by application of EPA Reference Method 2.

11.5.5.2 Each exhaust stack PM/PM₁₀ concentration shall be multiplied by its corresponding exhaust stack velocity (dry basis) to calculate the mass emission rate.

11.5.5.3 An equivalent exhaust stack velocity test method may be used if approved in advance by Ecology.

11.5.6 Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.

11.6 Cardinal will monitor continuing compliance for the cullet return bag house relative to Conditions 11.2 and 11.3.

- 11.6.1 Beginning on the date the initial performance test in Condition 11.5 is completed or is required to be complete whichever date comes first.
 - 11.6.1.1 Not less than once every twelve months until the initial performance and two consecutive subsequent annual tests demonstrate compliance with Conditions 11.2 and 11.3.
 - 11.6.1.2 Thereafter, not less than once every 36 months unless failure to comply with Conditions 11.2 or 11.3 is demonstrated by testing under the procedure outlined in Conditions 11.6.3 and 11.6.4, respectively.
 - 11.6.1.3 Failure to comply with Conditions 11.2 or 11.3 triggers return to source testing not less than once every twelve months, but may return to not less than once every 36 months if three consecutive subsequent annual tests demonstrate compliance with Conditions 11.2 and 11.3.
- 11.6.2 The weight of glass draw is monitored and recorded for the duration of the performance test.
- 11.6.3 Compliance will be determined by the arithmetic mean of not fewer than three test samples using EPA Reference Methods 5 or 201 and 202.
 - 11.6.3.1 Compliance will be demonstrated from the arithmetic mean of not fewer than three test samples each of not less than 100 dry standard cubic feet in volume.
 - 11.6.3.2 An equivalent concentration test method may be used if approved in advance by Ecology.
- 11.6.4 Compliance with Condition 11.3 will be monitored from the PM/PM₁₀ concentrations determined pursuant to Condition 11.6.3.
 - 11.6.4.1 Each exhaust stack velocity shall be determined by application of EPA Reference Method 2.
 - 11.6.4.2 Each exhaust stack PM/PM₁₀ concentration shall be multiplied by its corresponding exhaust stack velocity (dry basis) to calculate the mass emission rate.
- 11.6.5 An equivalent exhaust stack velocity test method may be used if approved in advance by Ecology. Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.
- 11.7 Cardinal will monitor continuing compliance for the elevator bottom, elevator top, and batch mixer bag houses relative to Conditions 11.2 and 11.4.
 - 11.7.1 Beginning on the date the initial performance test in Condition 11.5 is completed or is required to be complete whichever date comes first.
 - 11.7.1.1 Not less than once every 60 months unless failure to comply with Conditions 11.2 and 11.4 is demonstrated by testing under the procedure outlined in Conditions 11.7.3 and 11.7.4, respectively.

- 11.7.1.2 Failure to comply with Conditions 11.2 and 11.4 triggers source testing not less than once every twelve months, but may return to not less than once every 60 months if two consecutive subsequent annual tests demonstrate compliance with Conditions 11.2 and 11.4.
 - 11.7.2 The weight of glass draw is monitored and recorded for the duration of the performance test.
 - 11.7.3 Compliance will be determined by the arithmetic mean of not fewer than three test samples using EPA Reference Methods 5 or 201 and 202.
 - 11.7.3.1 Compliance will be demonstrated from the arithmetic mean of not fewer than three test samples each of not less than 100 dry standard cubic feet in volume.
 - 11.7.3.2 An equivalent concentration test method may be used if approved in advance by Ecology.
 - 11.7.4 Compliance with Condition 11.4 will be monitored from the PM/PM₁₀ concentrations determined pursuant to Condition 11.7.3.
 - 11.7.4.1 Each exhaust stack velocity shall be determined by application of EPA Reference Method 2.
 - 11.7.4.2 Each exhaust stack PM/PM₁₀ concentration shall be multiplied by its corresponding exhaust stack velocity (dry basis) to calculate the mass emission rate.
 - 11.7.5 An equivalent exhaust stack velocity test method may be used if approved in advance by Ecology. Cardinal will notify Ecology and SWCAA at least 30 days prior to the scheduled performance testing. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification to SWCAA alone will satisfy this condition.
12. VOC emissions from the glass cutting:
- 12.1 Lubricant used for glass cutting shall be mineral spirits containing less than 1% benzene by weight.
 - 12.2 Cardinal shall use no more than 7,317 pounds of glass cutting lubricant in any calendar month.
 - 12.3 Cardinal shall monitor compliance with Condition 12.1 by maintaining vendor certification records of the composition of the glass cutting lubricant (such as, but not necessarily exclusively, Material Safety Data Sheets).
 - 12.4 Cardinal will determine initial compliance with Condition 12.2 by calculating the first full calendar month's usage of glass cutting lubricant from facility shipping, receiving, and inventory records.

12.5 Beginning with the first full calendar month following the date of startup, Cardinal will monitor compliance with Condition 12.2 by calculating each month's glass cutting lubricant use from facility shipping, receiving, and inventory records.

13. Continuous Emission Monitoring Systems:

13.1 CEMS for NO_x and SO₂ will satisfy the requirements contained in 40 CFR, Part 60, Appendix B, Performance Specification 2 or 6 (as applicable) and 40 CFR, Part 60, Appendix F, Quality Assurance Procedures.

13.2 CEMS for CO will satisfy the requirements contained in 40 CFR, Part 60, Appendix B, Performance Specification 4A or 6 (as applicable) and 40 CFR, Part 60, Appendix F, Quality Assurance Procedures.

13.3 The Relative Accuracy Test Audit required for each installed CEMS will be scheduled to occur during simultaneous test periods.

14. Cardinal will provide safe access and sampling ports for source testing of each exhaust stack after the final pollution control device:

14.1 Safe access will consist of permanently constructed platforms on the stacks.

14.2 The sampling ports will meet the requirements of 40 CFR, Part 60, Appendix A, Method 1.

14.3 Other arrangements may be acceptable if approved by Ecology prior to installation.

15. Cardinal will notify and report to Ecology and SWCAA as follows. If the conditions of this PSD permit have been incorporated in Cardinal's Title V permit (40 CFR Part 70), notification and reporting to SWCAA alone will satisfy this condition.

15.1 Notifications and reports will be in written format or electronically if approved by Ecology.

15.2 The following notifications shall be submitted to Ecology and SWCAA:

15.2.1 Commencement of construction of the glass making plant: In accordance with 40 CFR 60.7(a)(1), no later than 30 calendar days after such date.

15.2.2 Initial startup of the glass furnace: In accordance with 40 CFR 60.7(a)(3), no later than 15 calendar days after such date.

15.2.3 Completion of the entry into the operation and maintenance manual of the items specified in Condition 16, within 15 days after such entries were completed.

15.2.4 At the time of submittal of the notification required in Condition 15.2.3, certification by the responsible party for the facility that the relevant equipment was installed consistent with the parameters developed pursuant to Condition 16.

15.2.5 The date on which the NO_x CEMS first demonstrated satisfactory performance pursuant to Condition 13.1, no later than 30 calendar days after such date.

15.2.6 The date on which the CO CEMS first demonstrated satisfactory performance pursuant to Condition 13.2, no later than 30 calendar days after such date.

15.3 The following reports shall be submitted to Ecology and SWCAA:

15.3.1 Report results of all initial compliance demonstrations pursuant to Conditions 4.5, 4.8, 5.4, 5.5, 6.3, 7.6, 7.6.6.2, 8.3, 10.4, 11.5, and 12.4 no later than 45 calendar days after completion of each respective source test.

15.3.2 Reports results of all source tests to SWCAA not later than 45 calendar days after completion of each respective source test.

15.3.3 Continuing performance monitoring reports required under Condition 15.3.4 shall be submitted not less frequently than once each calendar quarter:

15.3.3.1 Beginning with the quarter that includes the initial startup of the glass furnace.

15.3.3.2 Postmarked not later than one calendar month after the close of each respective calendar quarter.

15.3.3.3 In accordance with Ecology, report format requirements.

15.3.3.4 Another reporting schedule may be used if approved by Ecology.

15.3.4 Continuing performance monitoring reports will include, but not necessarily be limited to the following:

15.3.4.1 Certification by the responsible party for the facility that the only fuel burned in the glass furnace was natural gas as defined in Condition 1.

15.3.4.2 Certification by the responsible party for the facility that burnout maintenance was performed in compliance with Condition 3.

15.3.4.3 Certification by the responsible party for the facility that the relevant equipment was operated and maintained in accordance with the operational parameters and practices developed pursuant to Condition 16.

15.3.4.4 Emissions from the glass furnace exhaust stack:

15.3.4.4.1 Pursuant to compliance under Conditions 4.1, 4.2, 4.3, 4.4.1, and 4.4.2, NO_x emissions since the last report:

15.3.4.4.2 Pursuant to compliance under Conditions 5.2 and 5.3, CO concentrations since the last report.

15.3.4.4.3 Pursuant to compliance under Conditions 6.1 and 6.2 results of any source tests for SO₂ since the last report.

15.3.4.4.4 Pursuant to compliance under Conditions 7.2, 7.3, 7.4, and 7.5, results of any source tests for PM/PM₁₀ since the last report.

15.3.4.4.5 Pursuant to compliance under Conditions 8.1 and 8.2, results of any source tests for VOCs since the last report.

- 15.3.4.4.6 Emissions from the lehr: Pursuant to compliance under Condition 10.1, SO₂ consumption in the lehr.
- 15.3.4.5 Emissions from the cullet return, elevator bottom, elevator top, and batch mixer bag house exhaust stacks: Pursuant to compliance under Conditions 11.2 and 11.3 results of any source tests for PM₁₀ since the last report.
- 15.3.4.6 VOC emissions from glass cutting lubricant: Pursuant to compliance under Condition 12.2, weight in pounds of lubricant used each calendar month since the last report.
- 15.3.4.7 The duration and nature of any CEMS down-time excluding zero and span checks.
- 15.3.4.8 Results of any CEMS audits or accuracy checks.
- 15.3.5 Each occurrence of NO_x monitored emissions (Conditions 4.1 through 4.4), CO monitored emissions (Conditions 5.2 and 5.3), SO₂ emissions (Conditions 6.1, 6.2, and 10.1), PM₁₀ emissions (Conditions 7.2, 7.3, 7.4, 7.5, 11.2, and 11.3), or VOC emissions (Conditions 8.1, 8.2, and 12.2) measured in excess of the limits, failure to comply with glass furnace burnout-maintenance limitations (Condition 3), failure to continuously operate the hood located between the tin bath and lehr vent (Condition 10.2), or failure to comply with glass cutting lubricant composition limitations (Condition 12.1) shall be reported in writing to Ecology and SWCAA after the respective exceedance in accordance with WAC 173-400-107(3). Such reports shall as a minimum include:
 - 15.3.5.1 The time of the occurrence.
 - 15.3.5.2 Magnitude of excess from the emission limit.
 - 15.3.5.3 The duration of the excess.
 - 15.3.5.4 The probable cause.
 - 15.3.5.5 Corrective actions taken or planned.
 - 15.3.5.6 Any other agency contacted.
- 15.4 Cardinal will maintain fuel use records, monitoring, source test, CEM audit tests, and process records:
 - 15.4.1 At the Winlock facility.
 - 15.4.2 For at least five years.
 - 15.4.3 Monitoring and process records that include time and duration of startups, shutdowns, and burnout-maintenance operating periods of the glass furnace.
 - 15.4.4 Cardinal will provide Ecology and SWCAA with the monitoring and process records for any period within the five year archive within ten working days of request.
- 16. Operation and maintenance (O&M) manual for the facility:

- 16.1 Within 90 days of startup, Cardinal will identify operational parameters and practices for the glass furnace, lehr, SO₂ dry scrubber and electrostatic precipitator system, and cullet return, elevator bottom, elevator top, and batch mixer bag houses that constitute proper operation relative to compliance with the emission limitation conditions of this permit.
- 16.2 Cardinal will include these operational parameters and practices in the Winlock facility O&M manual. As a minimum, and to the extent they relate to the emission limitations specified in the conditions of this PSD permit, these will include
 - 16.2.1 Manufacturers' operating instructions and design specifications.
 - 16.2.2 Normal operating parameters.
 - 16.2.3 Updates to reflect any modifications of the equipment or its operating procedures.
- 16.3 Cardinal will keep the operational parameters and practices in the O&M manual up-to-date to the extent that they relate to the emission limitations specified in the conditions of this PSD permit.
- 16.4 Cardinal will keep the O&M manual readily available at the Winlock facility for review by state, federal, and local agencies.
- 16.5 Within 30 days of request from Ecology or SWCAA, Cardinal shall submit the O&M manual to the requesting agency for approval of any elements relevant to the emission limitations specified in the conditions of this PSD permit.
17. Nothing in this determination will be construed so as to relieve Cardinal of its obligations under any state, local, or federal laws or regulations.
18. Subject to RCW 70.94.200, Cardinal will permit the Environmental Protection Agency, state and local regulatory personnel access to the source upon request for the purposes of compliance assurance inspections.
19. This approval will become invalid
 - 19.1 If construction of the facility is discontinued for a period of eighteen (18) months.
 - 19.2 If construction of the project is not commenced within eighteen (18) months after receipt of the final approval. Upon written approval by Ecology, this PSD permit may be extended pursuant to 40 C.F.R. 52.21(r)(2) and applicable EPA guidance.
20. The effective date of this permit shall not be earlier than the date upon which the USEPA notifies Ecology that the USEPA has satisfied its obligations, if any, under Section 7 of the Endangered Species Act 16 U.S.C. § 1531 et seq., 50 C.F.R. part 402, subpart B (Consultation Procedures) and Section 305(b)(2) of the Magnuson-Stevens Fishery and

Conservation Act 16 U.S.C. § 1801 *et seq.*, 50 C.F.R. part 600, subpart K (EFH Coordination, Consultation, and Recommendations).

21. For federal regulatory purposes and in accordance with 40 CFR 124.15 and 124.19: If there was a public comment requesting a change in the preliminary determination or a proposed permit condition during the public review and comment period, the effective date of this permit shall not be earlier than 30 days after service of notice to the commenters and applicant on the final determination.

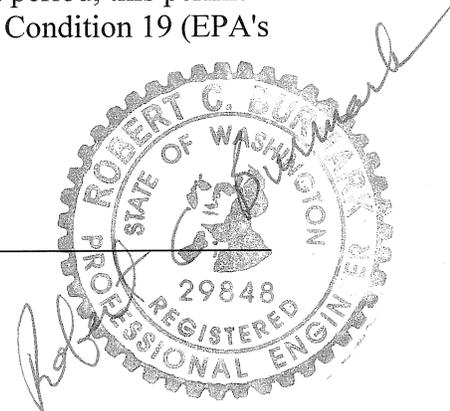
21.1 If a review of the final determination is requested under 40 CFR 124.19 within the 30-day period following the date of the final determination, the effective date of the permit is suspended until such time as the review and any subsequent appeal against the permit are resolved.

21.2 If there was no public comment requesting a change in the preliminary determination or a proposed permit condition during the public review and comment period, this permit is effective upon the date of finalization subject to consideration of Condition 19 (EPA's ESA requirement) above.

Reviewed by:

Robert C. Burmark
Robert C. Burmark, P.E.
Science and Engineering Section
Air Quality Program
Washington State Department of Ecology

12/13/2010
Date



Approved by:

Stuart A. Clark
Stuart A. Clark
Air Quality Program Manager
Washington State Department of Ecology

12/13/10
Date

Ecology was notified by the USEPA that the USEPA has satisfied its obligations under the Endangered Species and Magnuson-Stevens Acts relative to PSD Permit 03-03 issued to Cardinal FG Company, Winlock, WA on:

November 23, 2010
Date of USEPA notification

Stuart A. Clark
Stuart A. Clark
Air Quality Program Manager
Washington State Department of Ecology