



STATEMENT OF BASIS
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BAQ Engineering Services Division

Company Name	Guardian Industries, LLC	Permit Writer:	Hetal Patel
Permit Number:	TV-0640-0018	Date:	October 12, 2017

DATE APPLICATION RECEIVED: June 29, 2012

FACILITY DESCRIPTION:

Guardian Industries, LLC manufactures flat glass and pattern glass. The float glass manufacturing process begins with the receipt, storage, and weighting of various raw materials such as sand, soda ash, limestone, and dolomite into the batch house. The materials are mixed together in specific quantities to create a batch material that is fed into a melting furnace. The furnace operates at temperatures approaching 3,000°F to melt the batch into molten glass. The molten pool flows via gravity through the working end and then into the tin bath. At this point, the molten glass floats across the molten tin, where attendants manipulate and form a ribbon. The ribbon is pulled from the tin bath via rollers in a semi rigid state where it is cooled down in an annealing lehr. The ribbon is then cut on line to customer and industry specific sizes, packaged, and warehoused.

The facility has a glass forehearth off the melter which is used to produce pattern glass products. The molten glass is pulled through a set of imprested rollers where a pattern is pressed into the glass and then it goes through a lehr, cutters, and packaging operations.

Finished goods are also brought to the Glass Fabrication process where it may be cut, seamed, and tempered per customer requirements. Glass is also introduced into the Coater, in which a sputter coating process deposits molecular size particles onto the glass surface to provide various energy efficiency and glass performance properties. Broken glass, called cullet, is a byproduct of the process and is recycled into the batch material as a raw material. Cullet is also brought from other customers and is recycled as raw material.

PROJECT DESCRIPTION: This is the facility's Title V Operating Permit renewal.

CHANGES SINCE LAST OP ISSUANCE: The following changes are being made during this renewal:

- 1) Cullet Pad was permitted as a single emission source with Unit ID 3.02. To be consistent with the way the source has been included in modeling files, it will have two separate units (Cullet Pad 2a and Cullet Pad 2b) with Unit IDs 3.02 and 3.03.
- 2) Equipment ID 4.04 (1,000 lb/month SO₂ sprayer) has not been in service for a long time and will not be placed back in service so it is being removed from the permit. The previous application and TV Permit did not include ID 2.05 (SO₂ sprayer) that is part of the Pattern Glass Production Line. This equipment is being added to Unit 02.
- 3) Coater Process is added as Unit 05. It was exempted on July 13, 2011.
- 4) Media blast cabinet was exempted on November 29, 2012.
- 5) Incorporated construction permit Chr018.CF-R1 which allowed the facility to bypass the control devices for the furnace during routine control device maintenance.
- 6) Incorporated construction permit Chr018.CG which allowed the facility to produce color glass in the existing furnace.

SPECIAL CONDITIONS, MONITORING, LIMITS:

Facility installed the Scrubber/ESP control devices through construction permit CF when they re-bricked the furnace and increased production. The facility was issued a Synthetic Minor permit for this project. Control device maintenance was not addressed at the time the project was permitted. Facility had been bypassing the control devices to perform routine maintenance on the control devices because they could not shut the furnace down (NSPS



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allows up to maximum of 6 days/yr for PM bypass). These emissions were not accounted for; therefore, Construction permit CF was revised to include these emissions and allow the facility to bypass the control devices for routine maintenance for maximum of 6 days in each calendar year. NSPS Subpart CC also allows this. The permit has a condition which requires the facility to minimize emissions during these routine maintenance bypass events and another condition which limits amount of SO₂, PM, and H₂SO₄ during these bypass events.

EMISSIONS:

During this renewal, the facility's consultant revised emissions from sources that were not accurate. The facility had also conducted source test at a sister facility (in DeWitt, Iowa) on baghouse and used the emission factor from that source test to estimate emissions from this facility. The Source Evaluation Section reviewed the complete stack test report and approved it. For detail emission estimates, see email dated October 17, 2013. The controlled emissions include emissions of the furnace when bypassing the control devices (up to maximum of 6 days/yr as allowed by NSPS).

FACILITY WIDE EMISSIONS		
Pollutant	Uncontrolled Emissions	Controlled/Limited Emissions
	TPY	TPY
PM	283.07	78.82
PM ₁₀	263.26	73.98
PM _{2.5}	239.17	71.17
NO _x	1,991	--
CO	19.00	--
SO ₂	657.21	145.05
VOC	115.95	--
CO _{2e}	219,658	--
Total HAP	69.68	9.38
2-Methylnaphthalene	2.55E-05	--
3-Methylchloranthrene	1.91E-06	--
7,12-Dimethylbenzen-(a)anthracene	1.70E-05	--
Acenaphthene	1.91E-06	--
Acenaphthylene	1.91E-06	--
Anthracene	2.55E-06	--
Benz(a)anthracene	1.91E-06	--
Benzene	2.23E-03	--
Benzo(a)pyrene	1.28E-06	--
Benzo(b)fluoranthene	1.91E-06	--
Benzo(g,h,i)perylene	1.28E-06	--
Benzo(k)fluoranthene	1.91E-06	--
Chrysene	1.91E-06	--
Dibenzo(a,h)anthracene	1.28E-06	--
Dichlorobenzene	1.28E-03	--
Fluoranthene	3.19E-06	--
Fluorene	2.98E-06	--
Formaldehyde	7.97E-02	--



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FACILITY WIDE EMISSIONS		
Pollutant	Uncontrolled Emissions	Controlled/Limited Emissions
	TPY	TPY
Hexane	1.91E+00	--
Ideno(1,2,3-cd)pyrene	1.91E-06	--
Naphthalene	6.49E-04	--
Phenathrene	1.81E-05	--
Pyrene	5.32E-06	--
Toluene	3.61E-03	--
Arsenic	2.13E-04	--
Beryllium	1.28E-05	--
Cadmium	1.17E-03	--
Chromium	1.49E-03	--
Cobalt	0.657	0.07
Lead	5.32E-04	--
Manganese	4.04E-04	--
Mercury	2.76E-04	--
Nickel	2.23E-03	--
Selenium	67.014	7.3

REGULATORY APPLICABILITY REVIEW:

Regulation	Comments/Periodic Monitoring Requirements
Section II.E - Synthetic Minor	This facility is a major source for Title V and PSD purposes. The facility is operating under a Title V Operating Permit and does not have any synthetic minor limits for Title V applicability. The facility went through a synthetic minor (SM) permit to avoid PSD when the facility rebricked the furnace, they increased production. The SM limits on the furnace (CP Chr018.CF) are for PM, SO ₂ , NO _x , and Sulfuric Acid Mist. No additional synthetic minor limits are being imposed during this Title V renewal. See permit for details.
Standard No. 1	The furnace, and two propane vaporizers have PM, SO ₂ , and Opacity limits imposed by this standard.
Standard No. 3 (state only)	The furnace and vaporizers are fired on virgin fuel only therefore not subject to this standard.
Standard No. 4	This facility has sources subject to PM and Opacity limits imposed by this standard. See table below for details.
Standard No. 5	This facility does not have any sources that fall into any of the source categories in this regulation.
Standard No. 5.2	The emergency generators are exempt from this regulation per Section I(b)(2). The fire pumps are exempt from this regulation per Section I(b)(1). The furnace was constructed before 2004 and the burners have not been replaced therefore it is not subject to this regulation at this time.



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Regulation	Comments/Periodic Monitoring Requirements
	The two new burners (ID 1.82 and 1.83) to the exiting furnace assembly (each rated at 5.2 million Btu/hr). These burners together are 10.4 million Btu/hr and are subject to this standard. See permit for details.
Standard No. 7	The furnace went through a BACT analysis when it was constructed (CP Chr018.CA) and has PSD limits for PM, NOx, SO ₂ , and Sulfuric Acid Mists. The facility increased production (through construction permit Chr018.CF) which increased the potential emissions of these pollutants. The increase in emissions were above significant emissions thresholds. The facility added control devices to reduce emissions below the PSD significant emissions thresholds. This permit was issued as a synthetic minor permit. With these federally enforceable limits, the facility's emissions during normal operations are below PSD levels. 40 CFR 60, Subpart CC allows the facility to bypass the control devices for routine maintenance of the control devices for up to 6 calendar days in a year. During these bypass incidents, the facility's emissions must be below the initial PSD limits established in construction permit Chr018.CA. See permit for details.
61-62.6	The fugitive PM (Dust) emissions will be minimized to the maximum extent possible through proper housekeeping and/or wet suppression.
40 CFR 60 and 61-62.60	Subpart Kb: The fuel storage tanks are not subject due to size. Subpart CC: The furnace is subject to this regulation. See permit for detailed emission limits and work practice standards imposed by this regulation. Subpart IIII: The fire pumps and emergency generators were manufactured prior to April 1, 2006 therefore are exempt from any requirements at this time.
40 CFR 61 and 61-62.61	The facility emits some pollutants that are subject to this regulation but these emissions are from combustion of virgin fuels and therefore, the facility is not subject.
40 CFR 63 and 61-62.63	The facility's PTE of HAP(s) is above 10/25 TPY but not after controls therefore this facility is an area source for HAP emissions. The control devices were in place prior to the facility's PTE for HAPs increased above 10/25 TPY. Subpart ZZZZ: The emergency generators, pumps are subject to this rule. They were installed prior to June 12, 2006 therefore are existing sources. See permit for details. Subpart SSSSSS: This regulation applies to furnace that are continuous and use at least one metal HAP (arsenic, cadmium, chromium, lead, manganese, and nickel). This facility's furnace is a batch furnace and the raw materials do not contain any of these metal HAPs so this regulation does not apply. The metal HAPs listed on the facility-wide emissions table are emitted from combustion of natural gas. Subpart JJJJJJ: The facility has no boilers other than a domestic hot water heater for bathroom sinks and locker room showers. This unit uses natural gas only. Therefore, this subpart would not be applicable to the facility.



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Regulation	Comments/Periodic Monitoring Requirements
61-62.68	The facility does not store any chemicals above the threshold quantities therefore this regulation does not apply.
40 CFR 64	<p>The furnace is subject to CAM requirements. The facility submitted a CAM plan that was reviewed and approved for the previous Title V renewal. The current Title V Operating Permit has a condition outlined for this regulation. This condition has been revised to incorporate the following:</p> <p>CAM for opacity and H₂SO₄ has been added.</p> <p>CAM ranges have been updated based on most recent stack test and operation history.</p> <p>CAM parameter for PM emissions from ESP has been changed from voltage and currents in fields 1 and 2 to total power input. Based on research, ESP performance improves as total power input increase. Secondary voltage drops when a malfunction occurs in ESP. When voltage drops, less PM is collected. Secondary voltage can remain high but fail to perform its function if the collection plates are not cleaned, or rapped appropriately. This can cause the current to drop. For these reasons, just measuring field currents and voltages are not enough to determine if ESP is operating properly. Power is function of current and voltage, monitoring the power will provide a reasonable assurance that the ESP is functioning properly.</p> <p>The facility will utilize CEMs for NO_x and SO₂ monitoring.</p> <p>Added language to exclude emissions resulting during bypass of control device from CAM limits.</p> <p>QA/QC practices have been modified for more thorough monitoring and proper operation of the control devices.</p>

STANDARD 4 REVIEW

ID	Opacity (%)	Process Weight Rate (tons/hr)	Uncontrolled PM Emissions (lb/hr)	Controlled PM Emissions (lb/hr)	Monitoring
01 (except 1.01, 1.48, and 1.49)	20	32.08	50	14.4	Visual Inspection on a monthly basis. For sources with dust collectors, monitor pressure drop on a daily basis.
02	20	6.25	1.404	0.153	
03	20	--	1.17*	--	
04	20	10.42	1.404	0.153	
05	20	--	--	--	Not Required

*The PM emissions from Unit 03 are fugitive emissions. This unit will minimize fugitive per condition C.11 in the Operating Permit.

MODELING REVIEW



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Regulation	Comments/Periodic Monitoring Requirements
Standard No. 2	The facility is subject and has demonstrated compliance with this regulation, see modeling summary dated 1/23/14.
Standard No. 7.c	The facility is subject and has demonstrated compliance with this regulation, see modeling summary dated 1/23/14.
Standard No. 8 (state only)	The facility is subject and has demonstrated compliance with this regulation, see modeling summary dated 1/23/14.

PUBLIC NOTICE

This Title V Permit went through a 30-day public notice period and a 45-day EPA comment period in accordance with SC Regulation 61-62.1, Section II(N). This permit was placed in *The News and Reporter* newspaper on May 30, 2014. The comment period was open from May 30, 2014 to June 28, 2014 and was placed on the BAQ website during that time period. Comments were received during the comment period and are addressed in the Response to Comments documents.

Following changes have been made to the draft permit after public notice period ended:

Template changes throughout the permit. This includes renumbering sections and updated template condition (majority of these changes are outlined below).

Condition C.3 is now C.13 and condition updated due to template changes.

Condition C.4 is now C.3 and condition updated due to template changes.

Condition C.5 is updated due to template changes and to incorporate facility comments.

Condition C.6 is now C.4.

Condition C.7 is now C.6.

Condition C.8 is now C.7 – Added equipment ID's and control devices that will require visual inspection. The sources that vent indoors have been removed from this requirement since there would be no emissions into the atmosphere from these sources.

Condition C.9 is now C.8.

Condition C.10 is now C.9.

Condition C.11 is now C.10.

Condition C.12 is now C.11.

Condition C.13 is now C.12 – added regulatory citation at the beginning of the condition.

Condition C.14 is now C.15.

Condition C.15 is now C.16.

Condition C.16 is now C.17.

Condition C.17 is now C.18 and condition has been updated to incorporate consent decree requirements.

Condition C.18 is now C.19 and condition has been updated to incorporate consent decree requirements.

Condition C.19 is now C.20 – reworded 6 days/144 hours per facility comments.

Condition C.20 is now C.21.

Condition C.21 is now C.22.

Condition C.22 is now C.23.

Condition C.23 is now C.24 and condition has been updated to incorporate facility comments.

Condition C.24 is now C.14 and condition has been updated to incorporate consent decree requirements.



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Condition C.25 has been removed. The facility has installed CEMs which will be utilized to demonstrate the proper operation of the equipment. Air to fuel ratio is no longer necessary.

Condition C.26 is now C.25, condition and CAM plans have been updated. CAM for opacity and H₂SO₄ has been added. CAM ranges have been updated based on most recent stack test and operation history. CAM parameter for PM emissions from ESP has been changed from voltage and currents in fields 1 and 2 to total power input (see CAM regulatory review for details). The facility will utilize CEMs for NO_x and SO₂ monitoring. Added language to exclude emissions resulting during bypass of control device from CAM limits. QA/QC practices have been modified for more thorough monitoring and proper operation of the control devices.

Condition C.27 is now C.46 and condition updated to reflect template changes.

Condition C.28 is now C.43 and condition updated to reflect template changes.

Condition C.29 is now C.41.

Condition C.30 is now C.42 and is updated due to recent regulation changes (SO₂ limit for SC Regulation 61-62.5, Standard 1 changed from 3.5 lb/million Btu to 2.3 lb/million Btu).

Added conditions C.26-C.40 to incorporate consent decree requirements.

Added conditions C.44 and C.45 for clarification.

Part D is now Part H.

Part E is not Part I.

Part F is now Part D.

Part G is now Part E. Condition G.3 is now Condition E.3 and has been updated due to template changes.

Part H is now Part J.

Part I is now Part K.

Part J is now Part L.

Part K is now Part F.

Part L is now Part G.

Modeled Emission Rate Attachment has been updated due to template changes.

Following changes have been made due to facility's comments received March 16, 2016.

Facility name throughout permit and statement of basis changed to "Guardian Industries, LLC."

Control device 1808-DC added to equip ID 1.81 in table B.1.

Equipment description for ID 3.03 revised to cullet pad #3 on table B.5.

Equipment ID revised from 5.06 to 5.05 for glass cutter.

Removed ESP1/Scrubber from Condition C.6, this condition is for baghouse/dust collectors.

Incorporated 502(b)10 request dated May 19, 2017 into the permit – replace propane vaporizers Equipment IDs 1.48 and 1.49. This change only affected the installation date of these sources. This change did not trigger any new regulatory requirements.

SUMMARY AND CONCLUSIONS

It has been determined that this source, if operated in accordance with the submitted application, will meet all applicable requirements and emission standards.