



west virginia department of environmental protection

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ENGINEERING EVALUATION/FACT SHEET

B ACKGROUND INFORMATION

Application No.:	R13-2572C
Plant ID No.:	107-00010
Applicant:	SABIC Innovative Plastics US, LLC
Facility Name:	Washington Plant
Location:	Washington
NAICS Code:	325211
Application Type:	Modification
Received Date:	August 9, 2012
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$1000.00
Date Received:	August 9, 2012
Complete Date:	September 9, 2012
Due Date:	December 8, 2012
Applicant Ad Date:	August 10, 2012
Newspaper:	<i>The Parkersburg News and Sentinel</i>
UTM's:	Easting: 565.4 km Northing: 4,316.8 km Zone: 17
Description:	The application is for the permanent installation of 60 MM Btu/hr boiler.

DESCRIPTION OF PROCESS

SABIC Innovative Plastics US LLC (SABIC) owns and operates this manufacturing facility. The facility produces elastomers and thermoplastic resin to be used in the automotive, electronic and pipe industries. To support this manufacturing operation, the Washington Plant has three boilers at the facility to provide process heat energy required by these manufacturing operations.

Recently, SABIC's Boiler #4 has suffered serious damage that has left the unit nonoperational. While determining the extent of the repair and associated costs, SABIC elected to lease a smaller natural gas fired unit on a temporary basis. SABIC has determined that the

repairs to Boiler #4, if feasible, with take longer than anticipated. Thus, SABIC has made a business decision to purchase this leased unit and permanently install it at the Washington Plant.

The unit in question is a Babcock & Wilcox boiler manufactured in 1975. This particular unit was designed to produce 40,000 pounds of steam at 200 psig. The steam circuit at the Washington Plant allows steam produced by the boilers to be routed to several of the manufacturing units on an as needed basis. Thus, this new boiler will not be dedicated to a specific process unit.

SITE INSPECTION

On July 28 and August 1, 2011, Mr. Douglass Hammell, an inspector assigned to the Compliance and Enforcement Section, inspected the facility as part of a targeted inspection. In conclusion, Mr. Hammell determined that the facility has been operating in compliance of the applicable rules & regulations and permits. The writer concluded that a site visit was not necessary for this permitting action.

ESTIMATE OF EMISSION BY REVIEWING ENGINEER

The applicant used pollutant emissions factors from Chapter 1.4 of AP-42 to estimate emissions from this new natural gas fired boiler, which is identified as Boiler #6. The writer reproduces the estimated emissions from this boiler, which are presented in the following table:

Table #1 – Emissions from Boiler #6			
Pollutant	Emission Factor	Hourly Rate (lb/hr)	Annual Rate (TPY)
PM/PM ₁₀ /PM _{2.5} Filterable	1.9 lb/MMcf	0.11	0.48
PM Condensable Fraction	5.7 lb/MMcf	0.34	1.45
SO ₂	0.6 lb/MMcf	0.04	0.13
NO _x	100 lb/MMcf	5.88	25.01
CO	84 lb/MMcf	4.94	21.02
VOCs	5.5 lb/MMcf	0.32	1.4
CO ₂	120,000 lb/MMcf	7,058.82	30,917.63

SABIC has not decided what to do with Boiler #4. Boiler #4 can burn natural gas and fuel oil. This boiler has a design heat input rating of 132 MM Btu/hr. The writer estimated the potential to emit from Boiler #4 when burning natural gas for an idea of potential net change in emissions if SABIC elects not to repair or replace the unit.

Table #2 – Emissions from Boiler #4			
Pollutant	Emission Factor	Hourly Rate (lb/hr)	Annual Rate (TPY)
PM/PM ₁₀ /PM _{2.5} Filterable	1.9 lb/MMcf	0.25	1.1
PM Condensable Fraction	5.7 lb/MMcf	0.74	3.24
SO ₂	0.6 lb/MMcf	0.08	0.35
NO _x	280 lb/MMcf	36.24	158.73
CO	84 lb/MMcf	10.87	47.61
VOCs	5.5 lb/MMcf	0.71	3.11
CO ₂	120,000 lb/MMcf	15529.41	68,018.82

The writer is not suggesting that SABIC will decommission Boiler #4. Nevertheless, this action will have the potential to decrease NO_x emissions by 133 tons per year. On fuel oil, Boiler #4 has a permitted limit of 165.8 tons SO₂ per year, which would result in a decrease of the facility’s potential emissions while the unit is down.

REGULATORY APPLICABILITY

SABIC’s Washington Plant is a major source under Title V (45CSR30) and currently possesses a valid Title V Operating Permit. Under this program, new emission units have 12 month upon start-up to be incorporated in the facility’s operating permit. According to the DAQ’s policy on Rule 13 Guidance for Natural Gas Combustion Sources, Boiler #6 would not need to obtain a Rule 13. The estimated emissions confirm that none of the hourly emissions are above 6 pounds per hour. However, the Washington Plant is a major source of hazardous air pollutants (HAPs). Thus, the proposed Boiler #6 is an affected source subject to Subpart DDDDD of Part 63. Currently, this rule is enforceable. However, U.S. EPA has issued several “No Action Assurance” Letters for this rule and its sister rule which covers boilers located at an area source of HAPs. Further, U.S. EPA has proposed a reconsideration rule to replace the current regulation under consideration.

This unit is only capable of consuming natural gas. It is understood that sources burning this fuel are significantly below the applicable allowable limitations in Rule 2 and Rule 10, which are the State of West Virginia’s rules addressing particulate matter (PM) and sulfur dioxide (SO₂) from boilers, regardless of the size of the unit. This understanding is confirmed with the provisions in Rules 2A and 10A, which exempts such sources for conducting periodic testing and monitoring for the purpose of demonstrating compliance with the limitations under these rules.

The pollutants of concern for triggering major modification under Rules 14 (Prevention of Significant Deterioration) and 19 (Nonattainment New Source Review) are NO_x and CO. Wood County is in nonattainment for particulate matter less than 2.5 microns (PM_{2.5}). The

Washington Plant is a major source for NO_x, CO and VOCs. The facility is not a major source for PM_{2.5} directly. Thus only NO_x as a surrogate for PM_{2.5} is evaluated to determine if the project is significant for PM_{2.5}. The estimated potential increase in these two pollutants is less than the significant levels which are 40 ton per year significant levels for NO_x and 100 tons per year for CO. Thus, this project does not trigger any form of review under Rules 14 and 19.

The writer is only recommending establishing limits for NO_x and CO, which is in line with the DAQ's Rule 13 Guidance for Natural Gas Combustion Sources. One limit will be established for CO, which is from the Boiler MACT. The writer considered an annual for CO as well. However, the Boiler MACT CO limit would limit the CO emission from the unit to 40.4 tons of CO per year at the absolute maximum allowable. These two pollutants are related when considering combustion control in an effort to minimize these pollutants. Limiting the CO potential to emit would limit the source in minimizing NO_x in the future.

SABIC prepared and submitted a complete application, paid the filing fee, and published a Class I Legal ad in *The Parkersburg News and Sentinel* on August 10, 2012. This does not trigger any new regulations other than Subpart Dc for Boiler #6. Again, this NSPS standard does not establish any emission standard for Boiler #6 since it will only burn natural gas. The existing boilers at the facility are subject to the Boiler MACT and this proposed change does not affect the applicability status or the facility's ability to comply with it.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Boiler #6 will not emit any pollutants that aren't already being emitted by another emission source (i.e. Boiler #5) at the facility. Therefore, no information about the toxicity of the hazardous air pollutants (HAPs) is presented in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not meet the definition of a major modification of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

Rules 2, 10, and Subpart Dc only require recording of the amount of natural gas consumed each month for natural gas fired boilers. As noted earlier, this unit is subject to the CO standard from the Boiler MACT. The Boiler MACT requires annual CO testing of this affected source. No other monitoring is warranted for Boiler #6.

CHANGES TO PERMIT R13-2572B

Permit R13-2572B only covers Boiler #5. Boiler #5 is a 146 MMBtu/ hr, natural gas fired boiler that was constructed in 2004. This boiler is an affected source under Subpart Db of Part 60 and only subject to the NO_x Standard of §60.44b. The Rule 13 Guidance for Natural Gas Combustion Sources mentions that natural gas fired units over 100 MMBtu/hr are also subject to a particulate matter standard in Subpart Db. Under §60.43b Standard for Particulate Matter, affected sources under Subpart Db that only burns natural gas are not subject to the particulate matter standard of Subpart Db. In addition, the facility's Title V Permit only has the NO_x emission standard of Subpart Db applicable to Boiler #5.

The emissions limits for Boiler #5 in Permit R13-2572B are based on emission factors from Chapter 1.4 of AP-42 except for NO_x and CO. All of these hourly emission limits were annualized with no restriction of operation. The specific emission limits are tabularized in Condition 4.1.1. Conditions 4.1.2. & 4.1.5. cite the specific applicable requirements of Rule 2. Condition 4.1.6. cites the allowable from Rule 10. Condition 4.1.7. cites applicable requirements from 45 CSR13, which has been incorporated into the standard permit format.

Permit R13-2572B is written in the new format but did not take advantage of it or organize the specific requirements into sections specific in nature such as monitoring requirements in Section 4.2 and recordkeeping requirements in Section 4.4. Given that both of the boilers are similar (i.e. natural gas fired), the writer developed specific requirements for Boiler #5 in Condition 4.1.1. and specific requirements for Boiler #6. The monitoring requirements were combined when possible and separated when unique (i.e. Boiler #5 is required to have NO_x and CO Continuous Emission Monitoring Systems (CEMS)).

The problem with the emission limits for Boiler #5 in the permit is that the unit is subject to other rules that requires continuous monitoring for same pollutants but in different terms and averaging periods than what the emission limits were established in the permit. Typically, the mass hourly limits are understood to be a three hour average with compliance being demonstrated with three one hour test runs, unless otherwise stated in the permit. Using CEMS, the permittee is continuously measuring the pollutant concentration at least once every 15 minutes. Thus, these measurements will take place as the unit increases or decrease steam production, which effects the concentration of the pollutants being measured. The averaging period stated in Subpart Db, which is a 30 day average, will smooth out the emission increase as a result of these process changes or start-ups & shutdowns. The use of CEMs to demonstration compliance with a mass emission rate over a short averaging period should be carefully evaluated when incorporating such requirements into a permit.

The writer recommends omitting the emission limit table in Condition 4.1.1. and replacing it with limits focus on NO_x and CO. The short term NO_x and CO limits are based on the limit from Subpart Db, Part 60, of 0.20 lb of NO₂ per MMBtu and Subpart DDDDD, Part 63, of 400 ppm of CO. Compliance with both of these limits is on 30 day rolling average using CEMS. The CO emissions of the unit has the potential to exceed the PSD significance level and

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still be in compliance with the 30 day rolling average. Thus, annual limits for these two pollutants were established based on the annual limits already in Permit R13-2572B.

The limits for PM, VOC, and SO₂ were to be omitted. The limits in the permit were based on AP-42 factors and are far below the trigger levels in Rule13 (i.e. 1.1 lb/hr or less). The best way to limit these pollutants from this type of source is to restrict the fuel usage which was in the existing permit and carried over into this draft. The hourly fuel limit was omitted. Subpart Db only requires daily natural gas usage records which are used in the calculations for the 30 day rolling average for demonstrating compliance with the NO_x limit. The annual fuel usage limit is based on annualizing the hourly limit. The writer restricted Boiler #5 to be limited to only consume natural gas, which is Condition 4.1.1.b. By limiting the boiler to natural gas, it is understood that the applicable requirements of 45CSR§2-3.1., 45CSR§2-4.1.b., and 45CSR§10-3.1.e are satisfied, which are stated in 45CSR§2A-3.1., 45CSR§10-10.3., and 45CSR§10A-3.1.b. In addition, the applicable requirements from Rules 2 and 10 were omitted as well.

Condition 4.1.8 incorporates what appears to be all of the applicable requirements from Subpart Db. The following table outlines these requirements and notes how the writer addressed them in the draft permit.

Citation Number	Summary of the Citation	Recommended Action
§60.40b(a)	Basic definition of affected source	Omitted
§60.44b(a)	NO _x emission limit	Only incorporated the applicable limit
§60.44b(h) & (i)	Notes that the NO _x limits applies at all times and compliance is determined on a 30 day rolling average	Incorporated the pertinent requirements in the new NO _x limit.
§60.46b(e) & (e)(1)	Requirement to conduct initial compliance test	Omitted the requirement.
§60.48b(b), (b)(1) & (b)(2)	Requirements to Use CEMs for compliance with the NO _x standard.	(b)(2) was omitted because it allows the use of Part 75 CEM to be used in lieu of Part 60 CEMs. (b)(1) was incorporated in to Condition 4.2.4.
§60.48b(c), (d), (e), & (f)	Standards for the operating & maintaining the CEMS.	Incorporated in to Condition 4.2.4.
§60.48b(g), (g)(1) & (g)(2)	Requires the owners & operators to use CEMs or a plan to predict NO _x emissions	In-directly incorporated in Condition 4.2.4. which requires the use of CEMs.
§60.49b(a)	Initial notification requirements	Omitted

§60.49b(b)	Requirement to submit initial compliance demonstration.	Omitted
§60.49b(c), (c)(1) through (3)	Requirement to submit monitoring plan in lieu of CEMs	Not applicable – Omitted
§60.49b(d)	Requirement for daily fuel records	Incorporated into Condition 4.2.3.
§60.49b(g)	Requirement to keep records of CEMs data and other data needed to demonstrate compliance.	Condition 4.2.4. requires CEMS data to be maintained in accordance with Condition 3.4.1.
§60.49b(h)	Requirement to submit excess emission reports.	Included in Condition 4.5.1. requirements from (h)(2) and (h)(4). Other requirements were not applicable to this source.
§60.49b(o)	Requirement to maintain records for at least 2 years.	Omitted. Condition 3.4.1. already covers maintenance of records.

The requirement to submit semi-annual reports as required in §60.49b(w) was incorporated into Condition 4.5.1. Like Boiler #6, Boiler #5 is subject to the Boiler MACT as well. The only main difference for these two boilers under the Boiler MACT is that Boiler #5 must demonstrate compliance using CO CEMS. Thus, those provisions were incorporated into the permit, which are Conditions 4.1.1.iii, 4.2.2., and 4.5.3.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed modification of the facility will meet all the requirements of the application rules and regulations when operated in accordance to the permit application. Therefore, this writer recommends granting SABIC Innovation Plastics US LLC a Rule 13 modification permit for their Washington Plant located near Washington, WV.

Edward S. Andrews, P.E.
Engineer

November 9, 2012
Date

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