



west virginia department of environmental protection

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ENGINEERING EVALUATION/FACT SHEET

B BACKGROUND INFORMATION

Application No.:	R13-2023C
Plant ID No.:	057-00011
Applicant:	Alliant Techsystems Operations LLC (ATK)
Facility Name:	Allegany Ballistics Laboratory (ABL)
Location:	Rocket Center
NAICS Code:	3364115
Application Type:	Modification
Received Date:	August 28, 2013
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$3500.00
Date Received:	February 7, 2014
Complete Date:	February 21, 2014
Due Date:	May 22, 2014, 2014
Applicant Ad Date:	February 3, 2014
Newspaper:	<i>News Tribune</i>
UTM's:	Easting: 686.5 km Northing: 4,381.2 km Zone: 17
Description:	The application is for the replacement of burners for Boilers #L-11S and L-12S that allows use of natural gas and fuel oil.

DESCRIPTION OF PROCESS

Alliant Techsystems Inc. (ATK) operates the Allegany Ballistics Laboratory, which is near Rocket Center, WV. ATK has replaced the burners in existing in Boiler L-11S and L-12S to a dual fuel configuration. These boilers will be capable of burning natural gas and distillate oil. ATK has elected to only fire distillate oil as a backup in these units. The original configuration for the burners in these boilers was to fire completely with distillate oil. This change does not increase the heat input into each unit or steam production rate from the boilers, which is 9.9 MMBtu/hr at 8,625 pounds of saturated steam of 150 psig from each boiler.

SITE INSPECTION

On June 22, 2012, Mr. Karl Dettinger, a Compliance Inspector assigned to the Compliance and Enforcement Section of the DAQ, conducted a full-on- site inspection of the Allegany Ballistics Laboratory. During this inspection, Mr. Dettinger determined that the laboratory is operating in compliance.

ESTIMATE OF EMISSION BY REVIEWING ENGINEER

The applicant used pollutant specific emissions factors from Chapter 1.4 of AP-42 and manufacturer's data to estimate emissions from the replacement boilers. The potential emissions using natural gas for the boilers with the duel fuel burners are presented in the following table:

Pollutant	Emission Factor	Hourly Rate L-11S (lb/hr)	Hourly Rate L-12S (lb/hr)
PM Filterable/Condensable Fractions	0.52 lb/MMcf	0.01	0.01
PM ₁₀ Filterable/Condensable Fractions	0.52 lb/MMcf	0.01	0.01
PM _{2.5} Filterable/Condensable Fractions	0.33 lb/MMcf	0.003	0.003
Sulfur Dioxide (SO ₂)	0.6 lb/MMcf	0.006	0.01
Oxides of Nitrogen (NO _x)	100 lb/MMcf (L-11)	0.97	0.72
	60 ppm (L-12)		
Carbon Monoxide (CO)	84 lb/MMcf	0.82	0.82
Volatile Organic Compounds (VOCs)	5.5 lb/MMcf	0.05	0.05
Total Hazardous Air Pollutants (HAPs)	--	0.03	0.03
Carbon Dioxide Equivalent* (CO _{2e})	117.098 lb/MMBtu	1,161.61	1166.30

* Based on factors and global warming potentials from Tables A-1, C-1, and C-2 of Part 98 published on Federal Register on November 29, 2013.

The emissions from the use of the distillate oil were estimated using emission factors from Chapters 1.3 (oil fired) of AP-42. Sulfur dioxide emissions were based on 0.5 % sulfur content by weight.

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Pollutant	Emission Factor	Hourly Rate L-11S (lb/hr)	Hourly Rate L-12S (lb/hr)
PM Filterable/Condensable Fractions	3.3 lb/Mgal	0.24	0.24
PM ₁₀ Filterable/Condensable Fractions	1 lb/Mgal	0.07	0.07
PM _{2.5} Filterable/Condensable Fractions	1 lb/Mgal	0.072	0.07
Sulfur Dioxide (SO ₂)	71 lb/Mgal	5.10	5.10
Oxides of Nitrogen (NO _x)	20 lb/Mgal	1.44	1.44
Carbon Monoxide (CO)	5 lb/Mgal	0.36	0.36
Volatile Organic Compounds (VOCs)	0.2 lb/Mgal	0.01	0.01
Total Hazardous Air Pollutants (HAPs)	--	<0.001	<0.001
Carbon Dioxide Equivalent* (CO _{2e})	163.61 lb/MMBtu	1,623.01	1,629.56

Annual emissions are based on continuous operation of the unit. Worst case potential emissions when operating on fuel oil is based on 500 hours per year. The following table is the annual potential from these units with the dual fuel burner and the change from original burner configuration.

Pollutant	Combined New Annual Potential (tpy)	Combined Old Potential (tpy)	Net Change in Potential (tpy)
PM	0.16	2.1	-1.94
PM ₁₀	0.08	0.61	-0.53
PM _{2.5}	0.07	0.61	-0.54
SO ₂	2.61	44.68	-42.07
NO _x	7.73	12.61	-4.88
CO	7.16	3.15	4.01
VOCs	0.47	0.18	0.29
HAPs	0.25	<0.01	0.25
CO _{2e}	10,427	14243.76	-3,816.76

REGULATORY APPLICABILITY

The Allegany Ballistics Laboratory is a major source under Title V (45CSR30) and currently possesses a valid Title V Operating Permit. The facility is currently classified as a major source under Prevention of Significant Deterioration (PSD) and for HAPs.

The first step in determining major modification applicability is to determine which pollutants that the project is major for, which is illustrated in the following table.

Pollutant	New Potential from the Replacement Boiler (tpy)	Significance Threshold (tpy)	Significance Trigger (Yes/No)
PM	0.16	25	No
PM ₁₀	0.08	15	No
PM _{2.5} Direct	0.07	10	No
SO ₂	2.61	40	No
NO _x (precursor of Ozone and PM _{2.5})	7.73	40	No
CO	7.16	100	No
VOCs	0.47	40	No
CO ₂ equivalent (CO _{2e})	10,427	75,000	No

This project does not represent a “significant emission increase” (45CSR§14-2.75) for any NSR pollutant. Thus, no further review is required.

With regards to the National Ambient Air Quality Standards, Mineral County is classified as attainment for all pollutants. Thus, no further review of this application with regards to 45 CSR 19, West Virginia Non-Attainment Permitting Rule is required.

The replacement boiler is subject to Rules 2 & 10 (WV State Rules on PM and SO₂). The requirements from these rules and regulations are very minimal for natural gas fired boilers to comply with the applicable emission standards. 45 CSR §2-11.1 exempts the proposed unit from Sections 4, 5, 6, 8, and 9 of 45 CSR 2 based on size of the unit being less than 10 MMBtu/hr, which means the unit is only subject to the visible emission standard of Section 3. It is understood that combust of natural gas has little to no potential for visible emissions.

Further, the interpretive rule for Rule 2 (45 CSR 2A) specifically exempts units that only combust natural gas from implementing the Visible Emission Monitoring Plan Requirements of Rule 2A regardless of size of the unit. 45 CSR §10.1 exempts the proposed unit from Sections 3, 6, 7, and 8 of 45 CSR 10 based on size of the unit being less than 10 MMBtu/hr, which means there are no applicable emission standards in Rule 10 for this proposed unit.

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The facility is currently classified as a major source of HAPs, which means the facility has the potential to emit 10 tons per year of a single HAP, or 25 tpy of total HAPs. Within the application, ATK has not elected to determine if this project would change the facility's major source status for HAPs. Thus, these boilers are subject to 40 CFR 63, Subpart DDDDD – National Emission Standard for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial Commercial, and Institutional Boilers and Process Heaters.

Because ATK has elected to only use distillate as a back-up fuel to the natural gas for these units, Boilers L-11S and L-12S fall under the "Gas 1" category unit. These units will be limited to operate for only 48 hours per year on distillate oil for the purpose of conducting testing and readiness checks. During periods of natural gas curtailments or supply shortages, the units can be operated on distillate oil for the entire period of the curtailment or supplies have been restored.

This regulation establishes work practices as a means to comply with the emission standards (see Item 2 of Table 3 to Subpart DDDDD of Part 63). This tune-up requirement is applicable to the replacement boiler and must be conducted in accordance with 40 CFR §63.7540 and be conducted biennially. According to 40 CFR §63.7510(g) and §63.7515(d), the initial tune-up for these existing units must be completed before January 31, 2016. ATK will be required to conduct subsequent tune-ups every 25 months from the previous tune-up.

ATK will be required to conduct the energy assessment for the site by January 31, 2016 in accordance with item 4 of Table 3 to Subpart DDDDD of Part 63. These requirements will be incorporated into the permit.

ATK originally filed two Class II Administrative update requests for Permits R13-2023B and R13-2606A to account for these changes. During the review of these updates, it was determined that the units were subject to the Boiler MACT and potentially a PSD review of the project was warranted since the laboratory is an existing major source. Thus, the agency excised its discretion under 45 CSR §13-4.1a. that the burner replacement in the update requests warranted a modification permit. Therefore, both update requests were combined into Modification Permit Application R13-2023C.

ATK prepared and submitted a complete application, paid the filing fee, and published a Class I Legal ad in *News Tribune* on February 3, 2014, which is required under Rule 13 for a modification permit. The facility currently holds a valid Title V Operating Permit and included Attachment S of the application for a significant modification of this operating permit.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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

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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

As noted earlier, the modified boilers are subject to the Boiler MACT which requires biennial tune-ups for each boiler. The permit will require that the tune-up verify that the optimization of CO must be consistent with the manufacturer's specifications and that the NO_x concentrations or settings are at or within the manufacturer's specifications. The facility will be required to prove the site is using pipeline quality natural gas and distillate oil with less than 0.5 percent sulfur through fuel records or other supplier requirements. Because the two units can use two different types of fuels, there is an annual heat input limit. ATK will have to track the fuel usage on a monthly basis and then use it calculates the total heat energy input into the units from the previous 12 months. Other monitoring is tracking the length of time distillate oil is used and for what purpose to prove the units remain a "Gas 1 Unit" under Subpart DDDDD. For when one of the boilers has operated for more than 30 consecutive days on distillate oil, the permit will require a demonstration that the unit is achieving the visible emission standard of Rule 2 (10 % opacity limit).

CHANGE TO PERMIT R13-2023C & R13-2606A

Both of these permits were written for the boilers to be fired on distillate oil only. To be a "Gas 1 Unit", a boiler must be a natural gas fired unit and may use other light oils as back-up fuel if there are supply shortages or interruption of service. Thus, the permit(s) was completely written in that manner. Thus, Permit R13-2023C was written so that these boilers with dual fuel burners are operated primarily on natural gas with 48 hours per year on distillate oil for readiness checks and during natural gas curtailments or supply interruptions.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed modification of the Boilers L-11S and L-12S will meet all the requirements of the applicable rules and regulations when operated in accordance with the permit application. Therefore, the writer recommends granting ATK a Rule 13 modification permit for their Steam Plant #1 at the Allegany Ballistics Laboratory located near Rocket Center, WV.

Edward S. Andrews, P.E.
Engineer

March 25, 2014

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