

**Pennsylvania Technical Advisory Committee
On Diesel Powered Equipment**

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October 10, 2011

Joseph Sbaffoni, Director
Bureau of Mine Safety
Fayette County Health Center
100 New Salem Road, Room 167
Uniontown, Pa. 15401

Sbaffoni
Martin Walker
Guida
Antoon
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RE: Engine and emissions control package evaluation under Sections 403, 417 and 418 of the Act for a Deutz D2011 L02I (MSHA ID 07-ENA040010 Part 7) 30hp@2800rpm Engine with Rhomac DEC1202 emissions control system using an CleanAIR Permit Model FPA060W4CN - DPM filter and a CleanAIR Assure Model CWD0466BCCN diesel oxidation catalyst in a Rhomac Microtraxx Model MT3434 diesel track loader.

Dear Mr. Sbaffoni:

Chapter 4 of the "Bituminous Coal Mine Safety Act" (the Act) provides for the use of diesel-powered equipment in underground bituminous coal mines. Section 424 of the act created a Technical Advisory Committee ("TAC") for the purpose of advising the Department regarding implementation of Chapter 4 and evaluation of alternative technology or methods for meeting the requirements of Chapter 4.

Background

On April 26, 2011 Rhomac, Inc. submitted a request to the TAC and Bureau of Mine Safety (BMS) for approval for a Rhomac Microtraxx Model MT3434 diesel track loader using a Deutz D2011 L02I (MSHA ID 07-ENA040010 Part 7) 30hp@2800rpm Engine with Rhomac DEC1202 emissions control system using an CleanAIR Permit Model FPA060W4CN - DPM filter and a CleanAIR Assure Model CWD0466BCCN diesel oxidation catalyst. The engine and emissions control package has not been previously approved under Section 403 of the Act.

On April 29, 2011 the Director of BMS requested the TAC to evaluate the Microtraxx Model MT3434 diesel track loader using a Deutz D2011 L02I (MSHA ID 07-ENA040010 Part 7) 30hp@2800rpm Engine with Rhomac DEC1202 emissions control system using an

CleanAIR Permit Model FPA060W4CN - DPM filter and a CleanAIR Assure Model CWD0466BCCN diesel oxidation catalyst and to advise the Department regarding the TAC's recommendation as to whether the referenced equipment meets requirements of Section 403 of the Act.

The diesel power package includes the following items:

- Deutz D2011 L02I (MSHA ID 07-ENA040010 Part 7) 30hp@2800rpm Engine
- Rhomac Model DEC1202 emissions control system:
 - CleanAIR Permit Model FPA060W4CN - DPM filter (89% efficient)
 - CleanAIR Assure Model CWD0466BCCN diesel oxidation catalyst
 - Protectoseal Model F674 flame arrestor

More detailed information on the specifications of the diesel power package is included on the General Specification Sheet which is attached as Attachment 1.

Investigation

On October 6, 2011 the TAC and DEP traveled to Rhomac, Inc. in Mount Storm, WV to inspect the equipment when it became available. The TAC evaluated the engine and exhaust emissions package.

Emissions testing of the engine and after-treatment system were performed, as well as exhaust gas temperature monitoring and stall test procedure. The results of the emission tests showed the engine was performing within MSHA's approval specifications.

Monitoring of the exhaust gas temperature produced a high exhaust gas temperature reading of 118° F, which is well below the 302° F allowed by Section 403 (b)(4) of the Act. The maximum surface temperature observed was 230° F on the exhaust manifold after conducting all the CO testing. A smoke dot test was conducted and the result was a 1.

The after-treatment system is fitted with a CleanAIR Permit Model FPA060W4CN - DPM filter. The filter is rated by MSHA at an 87 % efficiency rating. The engine and filter extrapolations show that the diesel power package will result in an average ambient concentration of .10554 mg/m³ of diesel particulate matter when diluted by 100% of the MSHA approval plate ventilation rate for this engine, which is below the .12 mg/m³ requirement of Section 403 (a)(1) the Act.

In addition to the testing that was conducted, our investigation and our observations confirmed that the diesel power package is capable of meeting all the requirements of Section 403 of the Act.

The TAC requested Rhomac to add a more visible warning light for the fire suppression system, since this is a remote controlled machine where the operator may not always be able to see the warning light mounted on the rear of the machine. The addition of a strobe light on the top of the machine visible in all directions was agreed to by Rhomac.

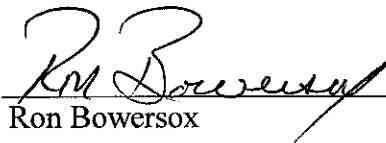
Recommendation

Our recommendation is based upon the data supplied by Rhomac, the results of the tests conducted on October 6, 2011, as well as the data acquired and observations made during our investigation. The TAC has determined that the Deutz D2011 L02I (MSHA ID 07-ENA040010 Part 7) 30hp@2800rpm Engine with Rhomac DEC1202 emissions control system using an CleanAIR Permit Model FPA060W4CN - DPM filter and a CleanAIR Assure Model CWD0466BCCN diesel oxidation catalyst meets all requirements of Section 403 of Chapter 4 of the Pennsylvania Bituminous Coal Mine Safety Act. As such, we are recommending approval of the above described diesel power package.

This recommendation is provided with the understanding that the General Specification Sheet (Attachment 1) be strictly adhered to.



Paul Borchick



Ron Bowersox

General Specification Sheet

I. Engine

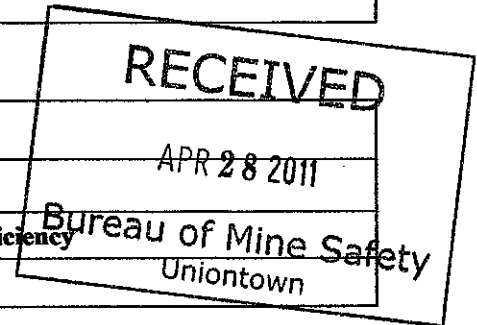
Manufacturer	Deutz	High Idle (RPM)	3000
Manufacturer Address	3883 Steve Reynolds Blvd Norcross, GA 30093	Particulate Index (PI)	2000
Engine Model No.	D 2011 L02 I	Gaseous Ventilation Rate (CFM)	1500
Engine Serial No.	tbd	Raw DPM (gr/hr)	3.26
HP/RPM	30.2 / 2800	MSHA Part 7 Approval No.	07-ENA040010
Low Idle (RPM)	900	Type of Aspiration	Natural
Max. Dirty Intake Air Restriction (H²O)	18	Turbocharger Boost Pressure (psi)	N/A
Max. Allowed Backpressure H²O	20	Fuel Delivery System	Direct Injection

II. Particulate Filter

Manufacturer	CleanAir Systems
Manufacturer Address	PO Box 23449, Santa Fe, NM 87502
Model Number	FPA060W4CN
System Type	Ceramic non-catalyzed
Efficiency Rating	89%

III. Catalyst

Manufacturer	CleanAir Systems
Manufacturer Address	PO Box 23449, Santa Fe, NM 87502
System Name	Assure DOC *25% DPM reduction efficiency
Model Number	CWD0466BCCN



IV. Flame Arrestor

Manufacturer	Protectoseal
Manufacturer Address	225 Foster Ave., Bensenville, IL 60106-1690
System Name	Series 670 End-of-Line Circular Plate Flame Arrestor
Model Number	F674
MESG	0.025"

ATTACHMENT 1