

217/785-1705

CONSTRUCTION PERMIT -- REVISED

PERMITTEE

Electro-Motive Diesel  
Attn: John Kaps  
9301 West 55th Street  
LaGrange, Illinois 60525

Application No.: 09120034

I.D. No.: 031174AAA

Applicant's Designation:

Date Received: October, 11 2011

Construction of: Engine Test Cells

Date Issued: February 2, 2012

Source Location: 9301 West 55th Street, McCook, Cook County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emissions source(s) and/or air pollution control equipment consisting of two new engine test cells and one revamped engine test cell, as described in the above referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1.1 Description

Electro-Motive Diesel, Inc. (EMD) manufactures locomotive components and diesel engines at its McCook facility. This permit originally authorized the installation of two new test cells, Test Cells 7 and 8, for research and development (R&D) and durability testing on diesel engines designed to meet the USEPA Tier 4 emission standards and other emission standards for locomotive and marine engines. This permit was subsequently revised to authorize changes to existing R&D Test Cells 2 and 3 to consolidate them into a single revamped test cell, now designated Test Cell 3 without any increase in the combined fuel usage or emissions for the consolidated test cells, also for testing of the diesel engines designed to meet new USEPA emission standards.

The current revision to this permit increases the permitted utilization and emissions of the new Test Cells 7 and 8. EMD requested this revision to complete development of engines that meet the new USEPA emission standards. The increase in permitted emissions of Test Cells 7 and 8 will be accompanied by contemporaneous decreases in actual emissions from the existing multi-use test cells MU-2 and MU-4. (See Attachment 1)

1.2 List of Emission Units

Emission Unit	Description	Emission Control Equipment
Test Cells 7 & 8	New Diesel Engine Test Cells	None
Test Cell 3	Existing Diesel Engine Test Cell, (formed by consolidating Test Cells 2 and 3)	Diesel Particulate Filter (DPF)
Test Cell MU-4	Existing Diesel Engine Test Cell	Turbocharging and Aftercooling

1.3 Applicability Provisions and Applicable Regulations

- a.
  - i. The affected new test cells for the purpose of this permit are Test Cells 7 and 8, as described in Conditions 1.1 and 1.2.
  - ii. The affected revamped test cell for the purpose of this permit is revamped Test Cell 3 and Test Cell MU-4 as described in Conditions 1.1 and 1.2.
  - iii. The affected test cells for the purpose of this permit are the affected new test cells and the affected revamped test cell as described in Conditions 1.3 a(i) and (ii).
- b. The affected test cells are subject to 35 IAC 214.301, which provides that no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission unit to exceed 2000 PPM [35 IAC 214.301].
- c.
  - i. The affected test cells are subject to 35 IAC 212.123, which provides that no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from an emission unit.
  - ii. Notwithstanding the above, if the Permittee conducts appropriate opacity observations and keeps relevant records, as also provided by 35 IAC 212.123, emissions of smoke or other particulate matter from a unit may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute period shall occur from only one emission unit owned or operated by the Permittee located within a 305 meter (1000 foot) radius from the center point of any other unit owned or operated by the Permittee, and provided further that such opaque emissions permitted from each such unit shall be limited to 3 times in any 24 hour period.

1.4 Non-Applicability Provisions

- a. This permit is issued based on this project not constituting a major modification under Prevention of Significant Deterioration (PSD) 40 CFR 52.21, or Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203 for emissions of NO<sub>x</sub>, this is because the net increase in emissions will not be significant. (See attachment 1)
- b. The affected test cells are not subject to 40 CFR 63 Subpart P, National Emission Standard for Hazardous Air Pollutants for Engine Test Cells and Stands, because the source is not a major source of HAP's.
- d. The affected test cells are not subject to 35 IAC 212.321 or 212.322, pursuant to 35 IAC 212.323. This is because there is not an appropriate process weight rate for the cells, to enable these standards to be reasonably applied.
- e. The affected test cells are not subject to state emissions standards for fuel combustion emission units, including IAC 212.206 (particulate matter), 35 IAC 214.122 or 214.304 (sulfur dioxide), 35 IAC 216.121 (carbon monoxide) or 35 IAC 217.141 (nitrogen oxides) because the affected test cell are not by definition a fuel combustion emission unit, as defined by 35 IAC 211.2470.

1.5 Operational and Production Limits and Work Practices

- a.
  - i. Low sulfur distillate fuel oil and other low sulfur fuels, such as ultra-low sulfur diesel, shall be the only fuels fired in the affected test cells.
  - ii. Test Cell MU-4 will test only Tier 2 engines or better.
- b.
  - i. The annual fuel usage of the affected new test cells shall not exceed 967,156 gallons.
  - ii. The annual fuel usage of the affected revamped Test Cell 3 shall not exceed 150,000 gallons.
  - iii. The annual fuel usage of Test Cell MU-4 shall not exceed 864,304 gallons.
  - iv. Compliance with these annual limits and other annual limits in this permit shall be determined from a running total of 12 months of data, i.e., from the sum of the data for the current month plus the preceding 11 months (running 12 month total).
- c. At all times the Permittee shall, to the extent practicable maintain and operate the affected test cells in a manner consistent with good air pollution control practices for

minimizing emissions. This provision does not require operation in a manner inconsistent with research and development activity. For example, the affected Revamped Test Cell need not be operated at all times with engines equipped with diesel particulate filters.

- d. Upon startup of the affected new test cells #7 and #8 the Permittee shall permanently cease operation of and decommission Test Cell MU-2 and shall comply with the engine and annual fuel usage limits for Test Cell MU-4 specified in condition 1.5 b.(iii).

1.6 Emission Limits

- a. Emissions from the affected new test cells shall not exceed the following limits. Compliance with these limits shall be determined in accordance with Condition 1.10.

Time Period	NO <sub>x</sub>	CO	VOM	PM/PM <sub>10</sub> /PM <sub>2.5</sub>
Tons/Month	37.3	3.98	1.37	1.34
Tons/Year	111.9	11.94	4.11	4.01

- b. Emissions from the Test Cells MU-4 shall not exceed 30 tons/month and 100 tons/year. Compliance with these limits shall be determined in accordance with Condition 1.11.

Time Period	NO <sub>x</sub>
Tons/Month	30.0
Tons/Year	100.00

- c. This permit is issued based on negligible emissions of sulfur dioxides (SO<sub>2</sub>) from the affected new test cells. For this purpose, the SO<sub>2</sub> emissions shall not exceed 0.1 lb/hour and 0.4 tons/year.
- d. This permit is issued based on minimal emissions of greenhouse gasses, GHG's, for the affected new test cells. For this purpose, emission of GHG shall not exceed 11,000 tons/year as CO<sub>2</sub>e.
- e. This permit is issued based on negligible emissions of hazardous air pollutants (HAPs) from the affected new test cells. For this purpose, total emissions of HAPs from these cells shall not exceed 0.1 lb/hour and 0.44 tons/year.

1.7 Testing Requirements

- a. Within 90 days of a written request from the Illinois EPA or such later date agreed to by the Illinois EPA, the Permittee shall have observations conducted for the opacity of the exhaust from the affected test cells. These opacity observations shall be conducted in accordance with Method 9, 40 CFR Part 60, Appendix A.

- b. Reports shall be submitted to the Illinois EPA within 30 days after conducting the observations. These reports shall include the information specified in Condition 1.8(d).

#### 1.8 Recordkeeping Requirements

The Permittee shall maintain the following records for the affected test cells:

- a. Records of the sulfur content of the fuel(s) used in the affected test cells, percent by weight and lb/gallon, with supporting documentation.
- b. A log or other records for the affected test cells identifying the engines that are tested, the type of engine (i.e., the relevant standards that the engines are being designed to meet) and the type and usage of fuel.
- c. Records of actual fuel usage by the affected test cells, by type of fuel and engine type, e.g., Tier 0, 2 or 4 (gal/mo and gal/yr).
- d. The following record related to emissions of CO, NO<sub>x</sub>, PM, and VOM of the affected new test cells:
  - i. The emission factors used by the Permittee for each engine type to determine emissions from the test cells, with supporting documentation.
  - ii. Records of emissions from the test cells (tons/month and tons/year), based on the fuel usage and the applicable emission factors for each engine type tested, with supporting calculations.
- e. Records of all opacity observations that are performed. These records shall be retained for at least three years after the date subsequent observations are performed and shall include the following:
  - i. The date and time of observations.
  - ii. The individuals that performed the observations.
  - iii. The operating conditions at the time of observation.
  - iv. Raw data and the results.

#### 1.9 Reporting Requirements

The Permittee shall promptly notify the Illinois EPA of any deviation by the affected test cells with the permit requirements. These reports

shall be submitted within 30 days of the deviation and shall describe the deviation, the probable cause of such deviation, the corrective actions taken, and any preventive measures taken.

1.10 Compliance Procedures

- a. To determine compliance with Condition 1.6, emissions of CO, NO<sub>x</sub>, PM and VOM from the affected test cells shall be calculated based on appropriate emission factors for the type of engine and amount of fuel used, such as the following unless the Permittee develops more refined factors for the engines being tested or subcategories of engines.

Pollutant	Emission Factor*(Lbs/1000 Gallons)			
	Tier 0 Engine	Tier 2 Engine	Tier 4 Engine	Revamped Test Cell 3
	Test Cells 7, 8 and MU-4			
CO	15.1	24.7	24.7	24.7
NO <sub>x</sub>	386.0	231.4	54.9	231.4
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	9.61	8.3	1.24**	3.3/8.3***
VOM	16.2	8.5	7.8	8.5

\* These are the emission factors provided in the application for engine testing for purposes of USEPA's current emission standards.

\*\* Emissions of PM/PM10/PM2.5 at an emission rate of 1.24 lbs/1000 gallons as established for a Tier 4-compliant engine.

\*\*\* Emission factors for testing of engines with and without use of the particulate filter.

1.11 The Permittee is allowed to operate the affected test cells under this construction permit until final action is taken on a revision to or renewal of its Clean Air Act Permit Program (CAAPP) permit that addresses the affected test cells. This condition supersedes standard Condition 6.

If you have any questions on this, please call Kevin Smith at 217/785-1705.

Edwin C. Bakowski, P.E.  
 Manager, Permit Section  
 Division of Air Pollution Control

Date Signed: \_\_\_\_\_

ECB:KLS:jws

cc: FOS - Region 1, Illinois EPA  
 CAAPP Permit File - 95120282, Illinois EPA

Attachment 1  
 Evaluation of Net Change in Emissions of NOx

Table 1  
 Project Emissions

	Emissions Increase (t/yr)
Emission Unit	NO <sub>x</sub>
Test Cells 7&8	111.9
Revamped Test Cell 3	0.0
Total	111.9

Table 2  
 Contemporaneous Emissions Changes\*  
 (March 2005 thru February, 2007 for MU-2)  
 (December 2004 through November 30, 2006 for MU-4)

	Emissions Changes (t/yr)
Emission Unit	NO <sub>x</sub>
Test Cell MU-2	-50.0
Test Cell MU-4	-55.3
Total	-105.3

\* The shutdown of Test Cell MU-2 will also be accompanied by decreases in emissions of CO, VOM and PM, PM10 projected at 2.8, 0.8, 0.9 and 0.6 tons/year, respectively. The decrease in permitted fuel firing of Test Cell MU-4 will only be accompanied by a creditable decrease in NO<sub>x</sub> emissions, due to operation with newer engine component(s) with tighter NO<sub>x</sub> controls.

Table 3  
 Contemporaneous Emissions Increases  
 (January 1, 2007 thru January 1, 2012)

	Emissions Increase (t/yr)
Emission Units	NO <sub>x</sub>
R&D Production Test Cell Platform(Permit 07120050)	32.0
Burn Off Oven (Permit 11060020)	1.0
Total	33.0

Table 4  
Net Emission Changes

	Net Emissions Change (t/yr)
Totals From Tables	NO <sub>x</sub>
Table 1	111.9
Table 2	-105.3
Table 3	+33.0
Net Emissions Change	39.6
Significant Increase Level	40