Appendix D: GHG Forms

CERTIFICATION OF CONSTRUCTION EQUIPMENT
COMPLIANCE FORM

Contractor Name: _____

Contract Number: _____

Description: _____

Location: **Massachusetts Army National Guard, Camp Edwards, Barnstable County, MA**

I, _____ (name of signee), authorized signatory for _____ (name of company) whose principal place of business is at _____ (company address) do hereby certify that any and all large non-road (greater than 50 brake horsepower) diesel construction equipment (DCE) to be used in the above-mentioned contract meets the EPA particulate matter (PM) Tier emission standards in effect for non-road diesel engines for the applicable engine power group or has emission control devices such as, oxidation catalysts or particulate filters installed on the exhaust system side of the diesel combustion engine equipment. Said equipment or devices meet the requirement of this specifications.

I am submitting on behalf of _____(company name) a list of said diesel construction equipment (see Attachment 1), labeled "Diesel Retrofit Data" that will be used in connection with this contract. The said list includes but is not limited to the number of vehicles subject to this certification and the number of vehicles retrofitted by vehicle type. The information provided in the said list is correct and accurate as of the date of signature and will be updated monthly to reflect the equipment operated at the job site. Any exemptions (see Attachment 2) from the emission standard compliance based on the exemptions will also be noted with the explanation for exemption.

I acknowledge that this certificate is being furnished as a requirement under this contract and subject to termination of contract, if the information provided is knowingly untruthful.

Signature: _____

Name: _____

Date: _____

Attachment 1 – Diesel Retrofit Data

Attachment 2 – Emission Standard Exemptions (if any)

Diesel Retrofit Data
DIESEL CONSTRUCTION EQUIPMENT (DCE) DATA SHEET

Contractor Name: _____

Contract Number _____

Description: _____

Location: Massachusetts Army National Guard, Camp Edwards, Barnstable County, MA

Equip. Type	Own/Rent	Equip. Make	Equip. Model & Year	Fuel Type	Equip. VIN	Equip. HP Rating	ECD Type DOC/DPF	ECD Manufact.	ECD Make	ECD Model	ECD Certif.	ECD Installation Date

EXAMPLE - GHG EXEMPTIONS

1. Rented diesel equipment greater than 50 brake hp that will be used on site for 30 days or less over the life of the project (i.e., 30 days cumulative) are exempt from this specification. However, if the rented equipment will be used more than 30 cumulative days, then the equipment must comply with this specification. In either case, rental equipment must be included as part of the detailed records of DCE. Note: Any contractor owned equipment that are more than 50 brake hp that are used on site for 30 cumulative days or less over the life of the project, are not exempt from complying with this specification.

2. Large cranes (such as Sky cranes or Link Belt cranes) which are responsible for critical lift operations are exempt from installing Retrofit Emission Control Devices if they adversely affect equipment operation. Technical justification must be submitted to the **MAARNG Engineer** for approval to document the impact on operations.

3. The **MAARNG Engineer** may create an exemption when there is a compelling emergency need to use diesel vehicles or engines that do not meet the contract conditions for emission controls. Examples include the need for rescue vehicles or other equipment to prevent or remedy harm to human beings or additional equipment required to address a catastrophic emergency such as structure collapse or imminent collapse. Once the emergency is controlled, such non-compliant equipment must be removed from the project. Meeting contract deadlines will not be considered a compelling emergency.

4. Diesel-powered non-road construction equipment greater than 50 brake horsepower need not be equipped with either EPA of CARB verified emission control technology if the non-road construction equipment diesel engine is certified to meet the EPA particulate matter (PM) Tier 4 emission standards in effect for non-road diesel engines for the applicable engine power group. *Such equipment shall be included in the list of equipment with a note that it meets the emission standard without additional controls.*

5. If an additional DCE (greater than 50 brake hp), or permanent replacement is brought on site after work has commenced, the Contractor has 15 calendar days from the time the DCE is brought on site, to install emission control technology verified by EPA or the California Air Resources Board (CARB) for use with "non-road engines" (unless the DCE has an engine that meets the EPA particulate matter (PM) Tier 4 emission standards in effect for non-road diesel engines for the applicable engine power group.

Nonroad Compression-Ignition Engines: Exhaust Emission Standards

	Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr)	NOx (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)	Smoke [a] (Percentage)	Useful Life (hours /years) [b]	Warranty Period (hours /years) [b]
Federal	kW < 8	1	2000-2004	-	10.5	-	1.0	8.0	20/15/50	3,000/5	1,500/2
		2	2005-2007	-	7.5	-	0.80	8.0			
		4	2008+	-	7.5	-	0.40 [c]	8.0			
	8 ≤ kW < 19	1	2000-2004	-	9.5	-	0.80	6.6		3,000/5	1,500/2
		2	2005-2007	-	7.5	-	0.80	6.6			
		4	2008+	-	7.5	-	0.40	6.6			
	19 ≤ kW < 37	1	1999-2003	-	9.5	-	0.80	5.5		5,000/7 [d]	3,000/5 [e]
		2	2004-2007	-	7.5	-	0.60	5.5			
		4	2008-2012	-	7.5	-	0.30	5.5			
			2013+	-	4.7	-	0.03	5.5			
	37 ≤ kW < 56	1	1998-2003	-	-	9.2	-	-		8,000/10	3,000/5
		2	2004-2007	-	7.5	-	0.40	5.0			
		3 [f]	2008-2011	-	4.7	-	0.40	5.0			
		4 (Option 1) [g]	2008-2012	-	4.7	-	0.30	5.0			
		4 (Option 2) [g]	2012	-	4.7	-	0.03	5.0			
		4	2013+	-	4.7	-	0.03	5.0			
	56 ≤ kW < 75	1	1998-2003	-	-	9.2	-	-			
		2	2004-2007	-	7.5	-	0.40	5.0			
		3	2008-2011	-	4.7	-	0.40	5.0			
		4	2012-2013 [h]	-	4.7	-	0.02	5.0			
			2014+ [i]	0.19	-	0.40	0.02	5.0			
	75 ≤ kW < 130	1	1997-2002	-	-	9.2	-	-			
		2	2003-2006	-	6.6	-	0.30	5.0			
		3	2007-2011	-	4.0	-	0.30	5.0			
		4	2012-2013 [h]	-	4.0	-	0.02	5.0			
			2014+	0.19	-	0.40	0.02	5.0			

Continued

	Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr	NOx (g/kW-hr	PM (g/kW-hr	CO (g/kW-hr)	Smoke [a] (Percentage)	Useful Life (hours /years) [b]	Warranty Period (hours /years) [b]
Federal	130 ≤ kW < 225	1	1996-2002	1.3 [j]	-	9.2	0.54	11.4	20/15/50	8,000/10	3,000/5
		2	2003-2005	-	6.6	-	0.20	3.5			
		3	2006-2010	-	4.0	-	0.20	3.5			
		4	2011-2013 [h]	-	4.0	-	0.02	3.5			
			2014+ [i]	0.19	-	0.40	0.02	3.5			
	225 ≤ kW < 450	1	1996-2000	1.3 [j]	-	9.2	0.54	11.4			
		2	2001-2005	-	6.4	-	0.20	3.5			
		3	2006-2010	-	4.0	-	0.20	3.5			
		4	2011-2013 [h]	-	4.0	-	0.02	3.5			
			2014+ [i]	0.19	-	0.40	0.02	3.5			
	450 ≤ kW < 560	1	1996-2001	1.3 [j]	-	9.2	0.54	11.4			
		2	2002-2005	-	6.4	-	0.20	3.5			
		3	2006-2010	-	4.0	-	0.20	3.5			
		4	2011-2013 [h]	-	4.0	-	0.02	3.5			
			2014+ [i]	0.19	-	0.40	0.02	3.5			
	560 ≤ kW < 900	1	2000-2005	1.3 [j]	-	9.2	0.54	11.4			
		2	2006-2010	-	6.4	-	0.20	3.5			
		4	2011-2014	0.40	-	3.5	0.10	3.5			
			2015+ [i]	0.19	-	3.5 [k]	0.04 [l]	3.5			
	kW > 900	1	2000-2005	1.3 [j]	-	9.2	0.54	11.4			
		2	2006-2010	-	6.4	-	0.20	3.5			
		4	2011-2014	0.40	-	3.5 [k]	0.10	3.5			
			2015+ [i]	0.19	-	3.5 [k]	0.04 [l]	3.5			

Notes on following page.

Notes:

- For Tier 1, 2, and 3 standards, exhaust emissions of nitrogen oxides (NOx), carbon monoxide (CO), hydrocarbons (HC), and non-methane hydrocarbons (NMHC) are measured using the procedures in 40 Code of Federal Regulations (CFR) Part 89 Subpart E. For Tier 1, 2, and 3 standards, particulate matter (PM) exhaust emissions are measured using the California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines.
- For Tier 4 standards, engines are tested for transient and steady-state exhaust emissions using the procedures in 40 CFR Part 1039 Subpart F. Transient standards do not apply to engines below 37 kilowatts (kW) before the 2013 model year, constant-speed engines, engines certified to Option 1, and engines above 560 kW.
- Tier 2 and later model naturally aspirated nonroad engines shall not discharge crankcase emissions into the atmosphere unless these emissions are permanently routed into the exhaust. This prohibition does not apply to engines using turbochargers, pumps, blowers, or superchargers.
- In lieu of the Tier 1, 2, and 3 standards for NOX, NMHC + NOX, and PM, manufacturers may elect to participate in the averaging, banking, and trading (ABT) program described in 40 CFR Part 89 Subpart C.

a Smoke emissions may not exceed 20 percent during the acceleration mode, 15 percent during the lugging mode, and 50 percent during the peaks in either mode. Smoke emission standards do not apply to single-cylinder engines, constant-speed engines, or engines certified to a PM emission standard of 0.07 grams per kilowatt-hour (g/kW-hr) or lower. Smoke emissions are measured using procedures in 40 CFR Part 86 Subpart I.

b Useful life and warranty period are expressed hours and years, whichever comes first.

c Hand-startable air-cooled direct injection engines may optionally meet a PM standard of 0.60 g/kW-hr. These engines may optionally meet Tier 2 standards through the 2009 model years. In 2010 these engines are required to meet a PM standard of 0.60 g/kW-hr.

d Useful life for constant speed engines with rated speed 3,000 revolutions per minute (rpm) or higher is 5 years or 3,000 hours, whichever comes first.

e Warranty period for constant speed engines with rated speed 3,000 rpm or higher is 2 years or 1,500 hours, whichever comes first.

f These Tier 3 standards apply only to manufacturers selecting Tier 4 Option 2. Manufacturers selecting Tier 4 Option 1 will be meeting those standards in lieu of Tier 3 standards.

g A manufacturer may certify all their engines to either Option 1 or Option 2 sets of standards starting in the indicated model year. Manufacturers selecting Option 2 must meet Tier 3 standards in the 2008-2011 model years.

h These standards are phase-out standards. Not more than 50 percent of a manufacturer's engine production is allowed to meet these standards in each model year of the phase out period. Engines not meeting these standards must meet the final Tier 4 standards.

i These standards are phased in during the indicated years. At least 50 percent of a manufacturer's engine production must meet these standards during each year of the phase in. Engines not meeting these standards must meet the applicable phase-out standards.

j For Tier 1 engines the standard is for total hydrocarbons.

k The NOx standard for generator sets is 0.67 g/kW-hr.

l The PM standard for generator sets is 0.03 g/kW-hr.

Citations: Code of Federal Regulations (CFR) citations:

- 40 CFR 89.112 = Exhaust emission standards
- 40 CFR 1039.101 = Exhaust emission standards for after 2014 model year
- 40 CFR 1039.102 = Exhaust emission standards for model year 2014 and earlier
- 40 CFR 1039 Subpart F = Exhaust emissions transient and steady state test procedures
- 40 CFR 86 Subpart I = Smoke emission test procedures
- 40 CFR 1065 = Test equipment and emissions measurement procedures

Table 4-7 Tier 1, 2 and 4 PM Emission Standards for Off-Road Diesel Engines*

Engine Power	Tier	Effective Model Year	PM (g/bhp-hr)
<11 hp	1	2000	0.75
	2	2005	0.60
	4	2008	0.30
≥11 hp to <25 hp	1	2000	0.60
	2	2005	0.60
	4	2008	0.30
≥25 hp to <50 hp	1	1999	0.60
	2	2004	0.45
	$4_{interim}$	2008	0.22
	4_{final}	2013	0.02
≥50 hp to <75 hp	1	-	-
	2	2004	0.30
	4	2013	0.02
≥75 hp to <100 hp	1	-	-
	2	2004	0.30
	4	2012	0.01
≥100 hp to <175 hp	1	-	-
	2	2003	0.22
	4	2012	0.01
≥175 hp to <300 hp	1	1996	0.40
	2	2003	0.15
	4	2011	0.01
≥300 hp to <600 hp	1	1996	0.40
	2	2001	0.15
	4	2011	0.02
≥600 hp to <750 hp	1	1996	0.40
	2	2002	0.15
	4	2011	0.01
≥750 hp	1	2000	0.40
	2	2006	0.15
	$4_{interim}$	2011	0.07
All engines except generator sets	4_{final}	2015	0.03
Generator sets	4_{final}	2015	0.02

SOURCE: EPA (2016a).

* The standards do not cover marine vessels <50 hp, locomotives and underground mining equipment. EPA regulates these marine vessels and locomotives separately. The Mine Safety and Health Administration (MSHA) regulates diesel emissions and air quality in mines.