THE STATE of ALASKA
GOVERNOR BILL WALKER

**Department of Environmental Conservation**

DIVISION OF AIR QUALITY
Air Non-Point Mobile Sources

619 E. Ship Creek Avenue, Suite 249
Anchorage, Alaska 99501
Main: 907-269-7577
Toll Free: 866-241-2805
Fax: 907-269-7508
www.ADEC.alaska.gov

June 3, 2015

Jennifer Keller, Director
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Legacy Fleet and Assessment Center
1200 Pennsylvania Ave., NW
Washington, DC 20460

Subject: State of Alaska DERA Implementation Plan and Cost Share Request

Dear Ms. Keller:

The Alaska Department of Environmental Conservation (AADEC) Division of Air Quality submits this State of Alaska DERA Implementation Plan to demonstrate compliance with the RFP #EPA-OAR-OTAQ-14-05 programmatic requirements, and requests EPA authorize use of DERA's Tribal RFP Cost Share requirements for funds used in tribal communities. Due to limitations in its authority for making grants, loans, or rebates only to other state agencies, AADEC is partnering with the Alaska Energy Authority (AEA) to administer the State DERA program and utilize the funds it's entitled to receive under Title VII, Subtitle G, Section 793 of the Diesel Emissions Reduction Program (DERA) in the Energy Policy Act of 2005 (codified at 42 U.S.C. 16133).

AADEC/AEA will collaborate on an "electric generator repower" project that will replace diesel engines in power plants in four or more rural communities. Rural communities in Alaska are not connected to the electrical grid and must generate their own electricity. Small diesel power plants are used for this purpose and many of the power plants in these communities rely on old technology, high emitting, non-certified diesel engines.

The State DERA funds allocated to Alaska will be used to fund replacement of non-certified engines with Tier 2 industrial and Tier 3 marine engines. Use of Tier 4 industrial engines in prime power applications in remote areas of Alaska is not viable due to lack of diesel exhaust fluid (urea) and ULSD fuel. Tier 3 industrial engines with exhaust gas recirculation (EGR) and variable geometry turbochargers have proven unreliable. Rural Alaska communities rely on diesel engines for 24-hour prime power. Reliability is the first priority in selecting an engine. The engine/generator sets (gensets) must be reliable to provide consistent power to the residents to ensure their health and welfare. Tier 2 industrial and Tier 3 marine engines have proven reliability and performance, as well significant improvement in fuel economy and reduction in PM emissions compared to non-certified engines.

Diesel generation recovered heat is among the most viable and efficient energy conservation measures available to rural Alaska communities. AEA has constructed over 50 power plants that utilize recovered engine heat to significantly reduce heating fuel consumption of schools, water plants and other community facilities. Marine diesel engines equipped with water jacketed exhaust manifolds considerably increase available recovered engine heat compared to an equivalent horsepower industrial engine. AEA carefully evaluates fuel economy and recovered heat availability when selecting and sizing engines for each power plant. In many cases, marine diesel engines provide the best lifecycle economic choice for remote Alaska communities.

The State of Alaska appreciates that EPA has acknowledged in prior New Source Performance Standards (NSPS) rulings that use of marine engines in prime power applications in remote areas of Alaska is appropriate. Installation of Tier 3 marine engines with DERA funds, where applicable, will be in accordance with DERA and NSPS requirements.

**State of Alaska Proposed DERA Implementation Plan**

RFP #EPA-OAR-OTAQ-14-05 authorizes certified engine repowers of electric generators in accordance with Sections I.B.2.f and III.D., subject to limitations on use of marine engines as described in Section III.D.1 and Appendix G. The State of Alaska Implementation Plan complies with the DERA requirements, as follows:

**Section I.B.2.f.1.b; Electric Generator Repower:**

ADEC will use DERA funds to repower existing non-certified diesel engines with newer, cleaner engines. The engine repowers will replace antiquated mechanically governed prime power diesel genset engines with their equivalent newer, more fuel efficient Tier 2 industrial or Tier 3 marine engines. Tier 2 industrial and Tier 3 marine engines are equipped with electronically controlled governors and high pressure common rail fuel systems, and are turbocharged and after-cooled, which improves performance and reduces emissions. In accordance with DERA cost-share requirements, DERA funds will be used to purchase engines and associated equipment and pay for freight, labor and materials needed to install the cleaner engines and implement required upgrades to interface the engines with the existing power plant cooling system and switchgear. Where remanufactured or rebuild engines are used they will be "certified Tier compliant" by conformance with 40 CFR 1068.120 as explained in the EPA-420-F-12-052 document.

**Section I.B.2.f.2; Repower Criteria:**

a. The repowered genset will continue to perform the same function as the existing non-certified engine.

b. Due to technological improvements including electronically controlled governors, high pressure fuel system, variable valve timing, higher compression ratios, and multiple valves per cylinder, Tier 2 industrial and Tier 3 marine engines have more horsepower than non-certified engines of the same displacement. Because the DERA engines will repower gensets in existing power plants, engine horsepower will be electronically derated to match the existing generator, feeder conductors, and switchgear breaker electrical rating.

c. Depending on the condition of the used non-certified engine block, and due to the high cost of freight in rural Alaska, some of the used engine blocks will be destroyed and disposed of in the local land fill. Where an engine block is in good condition, and freight costs support engine retrieval, AEA proposes to remove the used engine block from the community and

have it remanufactured to either a Tier 2 industrial or Tier 3 marine standard so that it may replace a non-certified prime power diesel engine in another rural Alaska community.

d. Non-certified engines to be replaced with DERA funds all have more than 3-years remaining useful life. The typical useful life of a prime power diesel genset engine, operating at 1800 rpm, is 60,000+ hours. To provide reliability and redundancy, a rural Alaska power plant contains three or more prime power diesel gensets. Gensets are typically operated in a lead-lag configuration, so each engine typically runs between about one-third and on-half of the time, or about 3,000 to 4,000-hours a year. All non-certified engines replaced with DERA funds will have less than 50,000-hours of documented run time.

**Section III.D.1 and Appendix G Restrictions - Not Applicable to Stationary Sources:**

Marine Tier 3 engines have proven reliable and efficient in prime power applications in Alaska villages. Use of Tier 3 marine engines to repower non-certified industrial diesel engines does not conflict with DERA requirements, as use of marine engines in a stationary source application are not subject to the Restriction for Mandated Measures of the RFP and are exempt from the requirements of EPAs locomotive and marine rule.

**Section III.D. Funding Restrictions:**

No DERA funding awarded under RFP #EPA-OAR-OTAQ-14-05 will be used for:

1. costs of emissions reductions that are mandated under federal law.
2. matching funds for other federal grants,
3. funding retrofit technologies on EPA's or CARB's "Formerly Verified Technologies" lists,
4. emissions testing and/or air monitoring activities
5. thru 11. Not Applicable
12. & 13. The non-certified diesel engines that will be repowered using DERA funds do not have less than seven years of useful life remaining and do not operate less than 500-hours per year.
14. DERA funds will be used to repower non-certified diesel genset engines with Tier 2 industrial and Tier 3 marine engines
15. thru 20. Not Applicable
21. No DERA funds will be used, nor cost-share applied, for expenses incurred prior to the assistance agreement project period.

**Tribal RFP Cost Share Request:**

RFP #EPA-OAR-OTAQ-14-05 Section III.B specifies a mandatory cost-share requirement of 60 percent for engine repower projects. However, there is precedent of EPA covering more of the cost for tribal projects under the tribal clean diesel funding assistance program. Specifically, RFP EPA-OAR-OTAQ-15-06 Section III.B specifies a mandatory cost-share of 25 percent for engine repowers under the FY15 tribal program. Since AADEC and AEA are using the state DERA funds to assist with engine repowers in Clark's Point, Golovin, Hughes, and Perryville, and since these are rural communities in Alaska that are federally recognized Alaskan Native Tribes, ADEC requests the more appropriate tribal cost cost-share requirement of the tribal RFP (EPA-OAR-OTAQ-15-06) be used rather than share specified in the national RFP (EPA-OAR-OTAQ-14-05).

As demonstrated in the attached work plan, this repower program results in significant emission reductions. The ADEC considers these repower projects to be a priority for the State DERA funding. Power generation in rural Alaska depends on diesel engines, often operating in the center of a village, close to homes, workplaces, and the school. The proximity of power plants to these buildings may pose a health risk to the health of the community and replacing the engines in these facilities with ones that meet more stringent emission requirements will reduce emissions. In addition, improved efficiency will require less fuel, again reducing emissions, and with the added benefit of lowered costs. Use of Tier 3 marine engines will increase available recovered heat and reduce community space heating fuel consumption and associated emissions. In rural communities, diesel fuel can run up to $10 a gallon. Any savings on fuel is a significant cost savings.

ADEC believes carrying out the State of Alaska DERA implementation plan will result in significant emissions reductions and assist financially struggling tribal communities to ensure safe, reliable and less polluting power.

We thank you for your time and consideration.

Sincerely,

Cindy Heil, Program Manager
ADEC, Division of Air Quality

cc: Denise Koch, ADEC/Air Quality Division Director
Rosalva Tapia, EPA OTAQ, Legacy Fleet and Assessment Center
Faye Swift, EPA OTAQ, Legacy Fleet and Assessment Center