

**INTER-OFFICE COMMUNICATION**

PS Memo #: 98-006

TO: OP and CP Engineers

FROM: Jim King  
Matt Burgett (October 12, 2012 revision)

DATE: (ver) October 12, 2012

RE: Natural gas fired Reciprocating Internal Combustion Engine (RICE) AOS

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The attached Alternative Operating Scenario (AOS) permit conditions are intended to provide sources with flexibility to make equipment changes in order to deal with an engine breakdown or periodic maintenance and repair of an existing onsite engine. It is the purpose of this AOS to provide flexibility while maintaining practical enforceability of both construction and operating permits and meeting all state and federal regulatory requirements. The AOS will not be applied retroactively and may need to be amended as conditions warrant. Future changes in Federal or State rules may also require revisions to this AOS.

**Overview**

The AOS allows a source to either temporarily or permanently replace an existing engine so long as the new engine meets the requirements of the AOS. The replacement of an existing engine with a new engine constitutes construction of a new emissions unit, not “routine replacement” of an existing unit. Ordinarily, the source would have to go through the permitting process and obtain a construction permit or an operating permit modification prior to such construction. The AOS serves as an advanced permit for the new engine, and therefore allows the source to replace an existing engine without undertaking a separate permit review. The AOS cannot be used for additional new emission points for any site. In other words, an engine that is being installed as an entirely new emission point and not as part of an AOS-approved installation related to an existing onsite engine has to go through the regular CP/OP permitting process.

**NSPS, MACT, and RACT Implications**

Due to recent Reg 7, NSPS, and MACT rule promulgations, the determination of applicable requirements for RICE has become much more complex. In order to continue to allow for permanent replacement engines the Division, with assistance from industry, has developed a series of Applicability Determination Reports that a source wishing to use the permanent replacement provisions of the AOS must complete and submit. With the addition of this feature,

we believe that the Division can continue to use this AOS to offer industry the operational flexibility it needs.

- New Source Performance Standard (NSPS) JJJJ (40 CFR Part 60) applies to any stationary spark ignition engines that commenced construction (engine ordered by the owner/operator) after July 12, 2006 and were manufactured on or after dates specified in the rule, the earliest of which is July 1, 2007.
- Maximum Achievable Control Technology (MACT) ZZZZ (40 CFR Part 63) applies to RICE located at both major and area sources.
- For any engine located in a designated attainment/maintenance or non-attainment area the permanent replacement provisions can be used, but as a “new” source it is subject to Reasonably Available Control Technology (RACT). RACT for these engines is defined in the AOS itself.

Note that the information submittal required for each permanent engine replacement must be certified by either 1) For Operating Permits, a Responsible Official as defined in Colorado Regulation No. 3, Part A, Section I.B.38. or 2) for Construction and General Permits, the person legally authorized to act on behalf of the source. This signed certification document must be packaged with the documents being submitted. By signing and submitting these documents, the source is agreeing that any new requirements identified in the Applicability Report shall be considered to be Applicable Requirements as defined in Colorado Regulation No. 3, Part A, Section I.B.9., and that such requirements shall be enforceable by the Division or its agents and shall be considered to be revisions to the underlying permit(s) referenced in the Report until such time as the Permit is revised to reflect the new requirements.

### **Major Stationary Source Implications**

The AOS **cannot be used** for the permanent replacement of an entire engine at any source that is currently a major stationary source for purposes of nonattainment area new source review or prevention of significant deterioration (NANSR/PSD) unless the engine has emission limits that are below the significance levels in Regulation No 3, Part D, Section II.A.42. for the applicable pollutant (e.g. a 39 TPY NO<sub>x</sub> limit).

For any engine located at a major stationary source that does not have emission limits below the significance levels, only the Temporary Replacement provisions can be used, but in those cases the definition of temporary for purposes of the AOS is changed from 90 days to 270 days in order to allow the Division the time required to process the request for a permanent engine replacement.

### **Summary of the AOS**

The AOS allows a facility to *temporarily* (up to 90/270 operating days in any 12 month period) replace an existing RICE with any other RICE as long as the replacement engine complies with any limitations or other requirements applicable to the original engine. The 90 (270) day period is the total number of operating days that the temporary replacement engine may operate. If the temporary replacement engine operates only part of a day, that day counts towards the 90 (270) day total.

Portable monitoring using the Division-approved Protocol is required upon engine replacement to monitor the compliance of the temporary replacement engine with the original engine's permitted emission limits (except that you can use AP42/Mfg emission factors instead of testing if the original engine is grandfathered, permit exempt, or has no emission limits on their permit *and* is covered by an Operating Permit).

The AOS allows a facility (except as described above for certain NANSR/PSD sources) to *permanently* (more than 90 total operating days in any 12 month period) replace an existing RICE with another engine as long as the permanent replacement engine complies with any permit limitations or other requirements applicable to the existing engine as well as any new applicable requirements identified in the Applicability Reports.

Measurement of emissions from the permanent replacement engine and compliance with the applicable emission limitations shall be made using a portable analyzer as set forth in section 2.2. Prior to issuance of the AOS, a review of the permanent replacement engines should be conducted using the appropriate procedures of Reg 3, Part B, including any appropriate engine/facility modeling.

### **Miscellaneous**

Any situation not covered by this AOS will require that the facility utilize the appropriate Regulation No. 3 permitting procedures to obtain a new or modified Permit, as appropriate.

FOR TEMPORARY REPLACEMENTS ONLY: In the case of a grandfathered or permit exempt engine that is not covered by an Operating Permit, the facility would have to voluntarily seek a permit, thus losing their grandfathered or permit exempt status. If the facility is covered by an Operating Permit, the engine may maintain its grandfathered or permit exempt status.

## Engine AOS

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### Permit Engineer User Notes:

- The use of 8760 hours to “ramp up” test results comes from PS Memo 98-3, Short Term Limits Policy:

In the case of permits issued under the new policy, monitoring results, such as those from stack testing, will be projected out for comparison to the emissions limits in the permit. If the reference test method lasts one hour and there are monthly and annual limits in the permit with no restriction on hours of operation, the test data will be multiplied by the number of hours in a month or hours in a year to determine compliance.

- NSPS JJJJ applies to all stationary spark ignition engines that commenced construction (engine ordered by the owner/operator) after July 12, 2006 and were manufactured on or after dates specified in the rule, the earliest of which is July 1, 2007.
- MACT ZZZZ applies to RICE located at both major and area sources.
- Note that as of the date of this memo that the Division *has not adopted* NSPS JJJJ. Therefore, the provisions of NSPS JJJJ apply only as federally enforceable requirements until it is adopted into Colorado Regulation No. 6, Part A. Under the federal rules, an engine that is relocated is not considered a modified engine and therefore relocation would not trigger the NSPS JJJJ requirements. However, under Colorado Regulation No. 6, Part B, Section I.B (which is referenced in Part A also), the relocation of an emission unit from outside of the State of Colorado into Colorado is considered new and subject to the provisions in Reg 6.

Also note that the emission standards and applicability dates found in Regulation No. 7, section XVII.E are the same as those in NSPS JJJJ and apply statewide.

### Major Stationary Source Implications

- The AOS cannot be used for the permanent replacement of an entire engine at any source that is currently a major stationary source for purposes of non-attainment area new source review and/or prevention of significant deterioration (NANSR/PSD) unless the engine has emission limits that are below the significance levels in Reg 3, Part D, II.A.42. (e.g. a 39 TPY NO<sub>x</sub> limit). Note that a permit would not necessarily need specific limits for all of the pollutants listed in Part D, II.A.42. For example, they would not need a TPY limit for Hydrogen Sulfide or even Sulfur Dioxide since the combination of emission factors and fuel limits could serve as effective limits.
- For any engine located at a major stationary source that does not have emission limits below the significance levels, only the Temporary Replacement provisions can be used, but in those cases the definition of temporary for purposes of the AOS is changed from 90 days to 270 days in order to allow the Division the time required to process the request for a permanent

engine replacement. So for major stationary sources, do a Word search for “90” and then replace it with “270”.

- The second and last paragraphs in section 2.1.2 shall be used only for sources that are currently major for NANSR/PSD.

### **Operating Permits vs. Construction Permit Implementation**

- There are a few instances where OP and CP language differs. See **bolded language** in 2.1 and 2.1.1.
- There is a Table 1 at the end of the document that lists acceptable permanent replacement engines. The table is primarily used in Operating Permits, but can be used in Construction Permits. If you choose not to use a Table, you should do a word search and delete “Table 1” from the text of the document.
- Appendix A contains all of the example Applicability Report formats. For OP’s, put this Appendix at the end of the OP appendices and label it accordingly, then do a word search for “Appendix A” and change it to the correct reference (e.g., Appendix G). For CP’s, we have decided to not attach the Appendix to the permit, but to refer the source to a website where they can access it. So do a Word search for “Appendix A” and then in parentheses put the website link: <http://www.cdphe.state.co.us/ap/oilgaspermitting.html>
- For the Engine AOS Applicability Report Certification Language Appendix A: Note that signatories are different: 1) For Operating Permits, a Responsible Official as defined in Colorado Regulation No. 3, Part A, Section I.B.38. or 2) for Construction and General Permits, the person legally authorized to act on behalf of the source.
- Please put the version date at the top of the AOS language in the permit.
- In order to bridge the gap between a source’s current permit and the revised permit that contains the new applicable requirements for a permanent replacement engine (which may never happen for a CP), the Applicability Reports will be scanned and hooked up to the appropriate plant/point in CACTIS.

# Engine AOS

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## 2. Alternative Operating Scenarios

The following Alternative Operating Scenario (AOS) for the temporary and permanent replacement of natural gas fired reciprocating internal combustion engines has been reviewed in accordance with the requirements of Regulation No. 3., Part A, Section IV.A, Operational Flexibility-Alternative Operating Scenarios, Regulation No. 3, Part B, Construction Permits, and Regulation No. 3, Part D, Major Stationary Source New Source Review and Prevention of Significant Deterioration, and it has been found to meet all applicable substantive and procedural requirements. This permit incorporates and shall be considered a Construction Permit for any engine replacement performed in accordance with this AOS, and the permittee shall be allowed to perform such engine replacement without applying for a revision to this permit or obtaining a new Construction Permit.

### 2.1 Engine Replacement

The following AOS is incorporated into this permit in order to deal with a compressor engine breakdown or periodic routine maintenance and repair of an existing onsite engine that requires the use of either a temporary or permanent replacement engine.

“Temporary” is defined as in the same service for 90 operating days or less in any 12 month period. “Permanent” is defined as in the same service for more than 90 operating days in any 12 month period. The 90 days is the total number of days that the engine is in operation. If the engine operates only part of a day, that day shall count as a single day towards the 90-day total. The compliance demonstrations and any periodic monitoring required by this AOS are in addition to any compliance demonstrations or periodic monitoring required by this permit.

All replacement engines are subject to all federally applicable and state-only requirements set forth in this permit (including monitoring and record keeping), **and shall be subject to any shield afforded by this permit.** *(use bolded for OP's only)*

The results of all tests and the associated calculations required by this AOS shall be submitted to the Division within 30 calendar days of the test or within 60 days of the test if such testing is required to demonstrate compliance with NSPS or MACT requirements. Results of all tests shall be kept on site for five (5) years and made available to the Division upon request.

The permittee shall maintain a log on-site and contemporaneously record the start and stop date of any engine replacement, the manufacturer, date of manufacture, model number, horsepower, and serial number of the engine(s) that are replaced during the term of this permit, and the manufacturer, model number, horsepower, and serial number of the replacement engine. In addition to the log, the permittee shall maintain a copy of all Applicability Reports required under section 2.1.2 and make them available to the Division upon request.

- 2.1.1 The permittee may **temporarily** replace an existing compressor engine that is subject to the emission limits set forth in this permit with an engine that is of the same manufacturer, model, and horsepower or a different manufacturer, model, or horsepower as the existing engine without modifying this permit, so long as the temporary replacement engine complies with all permit limitations and other requirements applicable to the existing engine. Measurement of emissions from the temporary replacement engine shall be made as set forth in section 2.2.

*(Paragraph in bold below for OP's only)*

**The permittee may temporarily replace a grandfathered or permit exempt engine or an engine that is not subject to emission limits without modifying this permit. In this circumstance, potential annual emissions of NO<sub>x</sub> and CO from the temporary replacement engine must be less than or equal to the potential annual emissions of NO<sub>x</sub> and CO from the original grandfathered or permit exempt engine or for the engine that is not subject to emission limits, as determined by applying appropriate emission factors (e.g. AP-42 or manufacturer's emission factors)**

- 2.1.2 The permittee may **permanently** replace the existing compressor engine for the emission points specified in Table 1 with the manufacturer, model, and horsepower engines listed in Table 1 without modifying this permit so long as the permanent replacement engine complies with all permit limitations and other requirements applicable to the existing engine as well as any new applicable requirements for the replacement engine. Measurement of emissions from the permanent replacement engine and compliance with the applicable emission limitations shall be made as set forth in section 2.2.

The AOS cannot be used for the permanent replacement of an entire engine at any source that is currently a major stationary source for purposes of Prevention of Significant Deterioration or Non-Attainment Area New Source Review ("PSD/NANSR") unless the existing engine has emission limits that are below the significance levels in Reg 3, Part D, II.A.42. *(this paragraph shall only be included for major stationary sources)*

An Air Pollutant Emissions Notice (APEN) that includes the specific manufacturer, model and serial number and horsepower of the permanent replacement engine shall be filed with the Division for the permanent replacement engine within 14 calendar days of commencing operation of the replacement engine. The APEN shall be accompanied by the appropriate APEN filing fee, a cover letter explaining that the permittee is exercising an alternative operating scenario and is installing a permanent replacement engine, and a copy of the relevant Applicability Reports for the replacement engine. Example Applicability Reports can be found in Appendix A. This submittal shall be accompanied by a certification from the Responsible Official indicating that "based on the information and belief formed after reasonable inquiry, the statements and information included in the submittal are true, accurate and complete".

This AOS cannot be used for permanent engine replacement of a grandfathered or permit exempt engine or an engine that is not subject to emission limits.

The permittee shall agree to pay fees based on the normal permit processing rate for review of information submitted to the Division in regard to any permanent engine replacement.

Nothing in this AOS shall preclude the Division from taking an action, based on any permanent engine replacement(s), for circumvention of any state or federal PSD/NANSR requirement. Additionally, in the event that any permanent engine replacement(s) constitute(s) a circumvention of applicable PSD/NANSR requirements, nothing in this AOS shall excuse the permittee from complying with PSD/NANSR and applicable permitting requirements. *(this paragraph shall only be included for major stationary sources)*

## 2.2 Portable Analyzer Testing

Note: In some cases there may be conflicting and/or duplicative testing requirements due to overlapping Applicable Requirements. In those instances, please contact the Division Field Services Unit to discuss streamlining the testing requirements.

Note that the testing required by this Condition may be used to satisfy the periodic testing requirements specified by the permit for the relevant time period (i.e. if the permit requires quarterly portable analyzer testing, this test conducted under the AOS will serve as the quarterly test and an additional portable analyzer test is not required for another three months).

The permittee may conduct a reference method test, in lieu of the portable analyzer test required by this Condition, if approved in advance by the Division.

The permittee shall measure nitrogen oxide (NO<sub>x</sub>) and carbon monoxide (CO) emissions in the exhaust from the replacement engine using a portable flue gas analyzer *within seven (7) calendar days of commencing operation of the replacement engine.*

All portable analyzer testing required by this permit shall be conducted using the Division's Portable Analyzer Monitoring Protocol (ver March 2006 or newer) as found on the Division's web site at: <http://www.colorado.gov/cs/Satellite/CDPHE-AP/CBON/1251596520270>.

Results of the portable analyzer tests shall be used to monitor the compliance status of this unit.

For comparison with an annual (tons/year) or short term (lbs/unit of time) emission limit, the results of the tests shall be converted to a lb/hr basis and multiplied by the allowable operating hours in the month or year (whichever applies) in order to monitor compliance. If a source is not limited in its hours of operation the test results will be multiplied by the maximum number of hours in the month or year (8760), whichever applies.

For comparison with a short-term limit that is either input based (lb/mmBtu), output based (g/hp-hr) or concentration based (ppmvd @ 15% O<sub>2</sub>) that the existing unit is currently subject to or the replacement engine will be subject to, the results of the test shall be converted to the appropriate units as described in the above-mentioned Portable Analyzer Monitoring Protocol document.

If the portable analyzer results indicate compliance with both the NO<sub>x</sub> and CO emission limitations, in the absence of credible evidence to the contrary, the source may certify that the engine is in compliance with both the NO<sub>x</sub> and CO emission limitations for the relevant time period.

Subject to the provisions of C.R.S. 25-7-123.1 and in the absence of credible evidence to the contrary, if the portable analyzer results fail to demonstrate compliance with either the NO<sub>x</sub> or CO emission limitations, the engine will be considered to be out of compliance from the date of the portable analyzer test until a portable analyzer test indicates compliance with both the NO<sub>x</sub> and CO emission limitations or until the engine is taken offline.

## 2.3 Applicable Regulations for Permanent Engine Replacements

### 2.3.1 Reasonably Available Control Technology (RACT): Reg 3, Part B § II.D.2

All permanent replacement engines that are located in an area that is classified as attainment/maintenance or nonattainment must apply Reasonably Available Control Technology (RACT) for the pollutants for which the area is attainment/maintenance or nonattainment. Note that both VOC and NO<sub>x</sub> are precursors for ozone. RACT shall be applied for any level of emissions of the pollutant for which the area is in attainment/maintenance or nonattainment, except as follows:

In the Denver Metropolitan PM<sub>10</sub> attainment/maintenance area, RACT applies to PM<sub>10</sub> at any level of emissions and to NO<sub>x</sub> and SO<sub>2</sub>, as precursors to PM<sub>10</sub>, if the potential to emit of NO<sub>x</sub> or SO<sub>2</sub> exceeds 40 tons/yr.

For purposes of this AOS, the following shall be considered RACT for natural-gas fired reciprocating internal combustion engines:

- VOC: The emission limitations in NSPS JJJJ
- CO: The emission limitations in NSPS JJJJ
- NO<sub>x</sub>: The emission limitations in NSPS JJJJ
- SO<sub>2</sub>: Use of natural gas as fuel
- PM<sub>10</sub>: Use of natural gas as fuel

As defined in 40 CFR Part 60 Subparts GG (§ 60.331) and 40 CFR Part 72 (§ 72.2), natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet.

2.3.2 Control Requirements and Emission Standards: Regulation No. 7, Sections XVI. and XVII.E (State-Only conditions).

*Control Requirements: Section XVI*

Any permanent replacement engine located within the boundaries of an ozone nonattainment area is subject to the applicable control requirements specified in Regulation No. 7, section XVI, as specified below:

Rich burn engines with a manufacturer’s design rate greater than 500 hp shall use a non-selective catalyst and air fuel controller to reduce emission.

Lean burn engines with a manufacturer’s design rate greater than 500 hp shall use an oxidation catalyst to reduce emissions.

The above emission control equipment shall be appropriately sized for the engine and shall be operated and maintained according to manufacturer specifications.

The source shall submit copies of the relevant Applicability Reports required under Condition 2.1.2.

*Emission Standards: Section XVII.E – State-only requirements*

Any permanent engine that is either constructed or relocated to the state of Colorado from another state, after the date listed in the table below shall operate and maintain each engine according to the manufacturer’s written instructions or procedures to the extent practicable and consistent with technological limitations and good engineering and maintenance practices over the entire life of the engine so that it achieves the emission standards required in the table below:

Max Engine HP	Construction or Relocation Date	Emission Standards in G/hp-hr		
		NO <sub>x</sub>	CO	VOC
100<Hp<500	January 1, 2008	2.0	4.0	1.0
	January 1, 2011	1.0	2.0	0.7
500≤Hp	July 1, 2007	2.0	4.0	1.0
	July 1, 2010	1.0	2.0	0.7

The source shall submit copies of the relevant Applicability Reports required under Condition 2.1.2.

2.3.3 NSPS for stationary spark ignition internal combustion engines: 40 CFR Part 60, Subpart JJJJ

A permanent replacement engine that is manufactured on or after 7/1/09 for emergency engines greater than 25 hp, 7/1/2008 for engines less than 500 hp, 7/1/2007 for engines greater than or equal to 500 hp except for lean burn engines greater than or equal to 500 hp and less than 1,350 hp, and 1/1/2008 for lean burn

engines greater than or equal to 500 hp and less than 1,350 hp are subject to the requirements of 40 CFR Part 60, Subpart JJJJ. An analysis of applicable monitoring, recordkeeping, and reporting requirements for the permanent engine replacement shall be included in the Applicability Reports required under Condition 2.1.2. Any testing required by the NSPS is in addition to that required by this AOS. Note that the initial test required by NSPS Subpart JJJJ can serve as the testing required by this AOS under Condition 2.2, if approved in advance by the Division, provided that such test is conducted within the time frame specified in Condition 2.2.

Note that under the provisions of Regulation No. 6. Part B, section I.B. that Relocation of a source from outside of the State of Colorado into the State of Colorado is considered to be a new source, subject to the requirements of Regulation No. 6 (i.e., the date that the source is first relocated to Colorado becomes equivalent to the manufacture date for purposes of determining the applicability of NSPS JJJJ requirements).

*However, as of October 1, 2011 the Division has not yet adopted NSPS JJJJ. Until such time as it does, any engine subject to NSPS will be subject only under Federal law. Once the Division adopts NSPS JJJJ, there will be an additional step added to the determination of the NSPS. Under the provisions of Regulation No. 6, Part B, § I.B (which is referenced in Part A), any engine relocated from outside of the State of Colorado into the State of Colorado is considered to be a new source, subject to the requirements of NSPS JJJJ.*

#### 2.3.4 Reciprocating internal combustion engine (RICE) MACT: 40 CFR Part 63, Subpart ZZZZ

A permanent replacement engine located at either an area or major source is subject to the requirements in 40 CFR Part 63, Subpart ZZZZ. An analysis of the applicable monitoring, recordkeeping, and reporting requirements for the permanent engine replacement shall be included in the Applicability Reports required under Condition 2.1.2. Any testing required by the MACT is in addition to that required by this AOS. Note that the initial test required by the MACT can serve as the testing required by this AOS under Condition 2.2, if approved in advance by the Division, provided that such test is conducted within the time frame specified in Condition 2.2.

### 2.4 Additional Sources

The replacement of an existing engine with a new engine is viewed by the Division as the installation of a new emissions unit, not “routine replacement” of an existing unit. The AOS is therefore essentially an advanced construction permit review. The AOS cannot be used for additional new emission points for any site; an engine that is being installed as an entirely new emission point and not as part of an AOS-approved replacement of an existing onsite engine has to go through the appropriate Construction/Operating permitting process prior to installation.

**Table 1****Internal Combustion Engine Information For AOS**

Emission Point	Replacement Engine	Periodic Monitoring	Subject to CAM?
C211	Caterpillar Model G379 4-Cycle Rich Burn Internal Combustion Engine, Rated at 330 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	No
C132	Waukesha Model F3521 4-Cycle Rich Burn Internal Combustion Engine, Rated at 450 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	No
C126	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 1,100 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	Yes
C133	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 1,232 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	Yes
C127	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 711 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	No
C129	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 711 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	No
C128	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 711 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	No
C149	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 1,232 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	Yes
C130	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 1,100 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	Yes
C134	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 750 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	No
C125	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 1,232 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	Yes
C131	Waukesha Model L7042GSI 4-Cycle Rich Burn Internal Combustion Engine, Rated at 1,232 HP (Site), Natural Gas Fired. Equipped with NSCR and AFR.	Portable Monitoring Quarterly	Yes

## **Appendix A – Applicability Reports**

**ver 10/12/12**

**Note: A MS Word version of this Appendix can be found at:**

**<http://www.colorado.gov/cs/Satellite/CDPHE-AP/CBON/1251597655816>**

### **DISCLAIMER:**

**These are only example reports and do not cover all possible requirements.**

## Engine AOS Applicability Report Certification Language

All information for the Applicability Reports must be certified by either 1) for Operating Permits, a Responsible Official as defined in Colorado Regulation No. 3, Part A, Section I.B.38. or 2) for Construction and General Permits, the person legally authorized to act on behalf of the source. This signed certification document must be packaged with the documents being submitted.

I have reviewed this certification in its entirety and, based on information and belief formed after reasonable inquiry, I certify that the statements and information contained in this certification are true, accurate and complete. Further, I agree that by signing and submitting these documents I agree that any new requirements identified in the Applicability Report(s) shall be considered to be Applicable Requirements as defined in Colorado Regulation No. 3, section I.B.9., and that such requirements shall be enforceable by the Division and its agents and shall be considered to be revisions to the underlying permit(s) referenced in the Report(s) until such time as the Permit is revised to reflect the new requirements.

Please note that the Colorado Statutes state that any person who knowingly, as defined in § 18-1-501(6), C.R.S., makes any false material statement, representation, or certification in this document is guilty of a misdemeanor and may be punished in accordance with the provisions of § 25-7 122.1, C.R.S.

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Printed or Typed Name

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Title

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Signature

Date Signed

## **Colorado Regulation No. 7 Sections XVI and XVII.E**

**DISCLAIMER:** This is only an example report and does not cover all possible Reg 7 requirements.

Company: Acme Gas Processing  
Source ID: 999/1234/001  
Permit #: 93OPXX999  
Date: October 1, 2008

Determination of compliance and reporting requirements for a

Manufacturer: BestEngineCompany  
Model: 777 LowNox  
Nameplate HP: 1340  
Construction date: July 1, 2007

Note: If the engine is exempt from a requirement due to construction date or was relocated from within Colorado, supporting documentation must be provided.

### **Determination of Regulation No. 7 requirements:**

#### **Regulation No. 7, § XVI**

Does not apply to this engine. Engine is not located in the ozone nonattainment area or does not have a manufacturer's design rate greater than 500 horsepower or did not commence operation on or after June 1, 2004.

Does apply to this engine and applicable emissions controls have been installed.

#### **Regulation No. 7, § XVII.E**

Does not apply to this engine. Engine does not have a maximum horsepower greater than 100 or the construction or relocation date precedes the applicability dates.

Does apply to this engine. The following emission limits apply to the engine:

NO<sub>x</sub> (g/hp-hr): 2.0  
CO (g/hp-hr): 4.0  
VOC (g/hp-hr): 1.0

Max Engine HP	Construction or Relocation Date	Emission Standards in g/hp-hr		
		NO <sub>x</sub>	CO	VOC
100<Hp<500	January 1, 2008	2.0	4.0	1.0
	January 1, 2011	1.0	2.0	0.7
500≤Hp	July 1, 2007	2.0	4.0	1.0
	July 1, 2010	1.0	2.0	0.7

## NSPS JJJJ Example Report Format

**DISCLAIMER:** This is only an example report and does not cover all possible JJJJ requirements.

Note that as of September 1, 2008 that the Division has not yet adopted NSPS JJJJ. Until such time as it does, any engine subject to NSPS will be subject only under Federal law. Once the Division adopts NSPS JJJJ, there will be an additional step added to the determination of the NSPS. Under the provisions of Regulation No. 6, Part B, § I.B (which is referenced in Part A), any engine relocated from outside of the State of Colorado into the State of Colorado is considered to be a new source, subject to the requirements of NSPS JJJJ.

### NSPS Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Company: Acme Gas Processing  
Source ID: 999/1234/001  
Permit #: 93OPXX999  
Date: October 1, 2008

Manufacturer: BestEngineCompany  
Model: 777 LowNox  
Nameplate HP: 1340  
Engine Type: 2 Stroke Rich Burn  
Manufacture Date: July 1, 2007  
Date Engine Ordered: April 1, 2007

Note: If the engine is exempt from a requirement due to construction/manufacture date, supporting documentation must be provided.

Upon adoption of NSPS Subpart JJJJ into Colorado Regulation No. 6, Part A, if the engine is exempt because the engine was relocated within the state of Colorado, supporting documentation must be provided.

NSPS JJJJ **does not apply** to this engine.

NSPS JJJJ **does apply** to this engine.

Note: Using the format below, the source must submit to the Division an analysis of all of the NSPS JJJJ applicable requirements that apply to this specific engine. **The analysis below is an example only**, based on a hypothetical engine that is a rich burn engine, greater than 500 HP, with a manufacture date after July 1, 2007.

## Determination of NSPS JJJJ requirements:

### **60.4230 Applicability**

- (a)(4)(i) Applies to this engine since it is a rich burn engine, greater than 500 HP, with a manufacture date after July 1, 2007.

### **60.4233 Emission Standards for Owners and Operators**

- (e) Owners and operators of stationary SI ICE with a maximum engine power greater than 100 HP must comply with the standards in Table 1.  
Non-Emergency SI, Natural Gas, HP $\geq$ 500, Manufactured after 7/1/2007
- |                 |   |
|-----------------|---|
| NO <sub>x</sub> | 2.0 g/HP-hr or 160 ppmvd@15% O <sub>2</sub> |
| CO              | 4.0 g/HP-hr or 540 ppmvd@15% O <sub>2</sub> |
| VOC             | 1.0 g/HP-hr or 86 ppmvd@15% O <sub>2</sub>  |

### **Other Requirements for Owners and Operators**

- 60.4234 Emission standards must be met for the lifetime of the engine.  
60.4235 N/A - Sulfur content of gasoline.  
60.4236 N/A (for now) - After July 1, 2009 owners and operators may not install engines with a power rating  $\geq$  500HP that do not meet the emissions standards in 60.4230.  
60.4237 N/A - Emergency Engines.

### **60.4238 - 60.4242 Compliance Requirements for Manufacturers – (Not Applicable)**

### **60.4243 Compliance Requirements for Owners and Operators**

- (b)(2)(ii) To maintain compliance with the emission limits in 60.4233, owners of SI ICE  $\geq$  500HP must:
- Keep a maintenance plan;
  - Keep records of conducted maintenance;
  - Maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions;
  - Conduct an initial performance test; and
  - Conduct subsequent performance tests every 8,760 hours or every three years, which ever comes first, in order to demonstrate compliance with the emission limits.
- (g) Air to fuel ratio controllers (AFRCs) must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times.

### **60.4244 Testing Requirements for Owners and Operators**

- (a) Each performance test must be conducted within 10% of the highest achievable load and must comply with the testing requirements listed in 60.8 and Table 2 of NSPS JJJJ.

- (b) Performance tests may not be conducted during periods of startup, shutdown, or malfunction, as specified in 60.8(c). If the engine is non-operational when a performance test is due, the engine does not need to be started up just to test it, but will need to be tested immediately upon startup.
- (c) Three separate test runs must be conducted for each performance test as specified by 60.8(f). Each run must be within 10% of max load and be at least 1 hour in duration.
- (d) To determine compliance with the NO<sub>x</sub>, CO, and VOC mass per unit output emission limitations, the measured concentration must be converted using the equations outlined in this section of NSPS JJJJ.

#### **60.4245 Notification, Reports, and Records for Owners and Operators**

- (a) Owners of all stationary SI ICE must keep records of the following:
  - (1) All notifications submitted to comply with this subpart;
  - (2) Maintenance conducted on the engine;
  - (3) N/A - Manufacturer information for certified engines, and
  - (4) Documentation that shows non-certified engines are in compliance with the emission standards.
- (b) N/A – For emergency engines only.
- (c) Owners of non-certified engines  $\geq$  500HP must submit an initial notification as required in 60.7(a)(1) which includes the following information:
  - (1) Name and address of the owner or operator;
  - (2) The address of the affected source;
  - (3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
  - (4) Emission control equipment; and
  - (5) Fuel used.

#### **CONCLUSION OF FINDINGS (EXAMPLE ONLY)**

In general, Acme's 1,235HP, Waukesha 7042 GSI engine is subject to the emissions limitations summarized in Table 1 of NSPS JJJJ. ACME will meet these emission limitations using an AFRC and a non-selective catalytic converter (NSCR). These emission rates will be met throughout the life of the engine. A maintenance plan will be kept and all maintenance activities will be recorded. Compliance with the emission limits will be confirmed by the initial performance tests, which shall be conducted following the procedures outlined in 60.4244. Copies of performance test results will be submitted within 60 days of the completion of each test. Since this is an uncertified engine, an initial notification will be submitted including all of the requested information in 40.4245 within 30 days of startup. ACME will keep records of all compliance related materials.

## MACT ZZZZ Example Report Format

**DISCLAIMER:** This is only an example report and does not cover all possible ZZZZ requirements.

### MACT Subpart ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Company: Acme Gas Processing  
Source ID: 999/1234/001  
Permit #: 93OPXX999  
Date: October 1, 2008

Manufacturer: BestEngineCompany  
Model: 777 LowNox  
Nameplate HP: 1340  
Engine Type: 2 Stroke Rich Burn  
Manufacture Date: July 1, 2007  
Date Engine Ordered: April 1, 2007

Note: If the engine is exempt from a requirement due to construction/reconstruction date, supporting documentation must be provided.

MACT ZZZZ **does not apply** to this engine.

MACT ZZZZ **does apply** to this engine.

Note: Using the format below, the source must submit to the Division an analysis of all of the major source MACT ZZZZ applicable requirements that apply to this specific engine. **The analysis below is an example only**, based on a hypothetical new engine located at a major source of HAP emissions.

#### Determination of MACT ZZZZ requirements:

##### **63.6585 Applicability**

This subpart is applicable to Acme's engine since they are going to be operating a new stationary reciprocating internal combustion engine (RICE) at a major source of HAP emissions.

##### **63.6590 What Parts of My Plant Does This Subpart Cover?**

This subpart covers Acme's new stationary reciprocating internal combustion engine.

##### **63.6595 When do I have to comply with this Subpart?**

(a)(5) The engine must comply with the applicable emission limitations and operating limitations upon startup.

**63.6600 Emission and operating limitations for RICE site rated at more than 500 hp**

- (a) The engine is subject to the emission limits in table 1a and the operating limits in table 1b. ACME will meet the emission limitations by reducing formaldehyde emissions by 76 percent and will maintain the catalyst such that the pressure drop does not change by more than 2 inches of H<sub>2</sub>O at 100 % load plus or minus 10 percent from the pressure drop measured during the initial performance test and will maintain the temperature of the engine exhaust so that the catalyst inlet temperature is greater than or equal to 750 ° F and less than or equal to 1250 ° F.

The engine will be equipped with non-selective catalytic reduction and an air fuel controller to meet the emission limitations.

**63.6601 & 63.6611 Requirements for 4SLB engines between 250 and 200 hp**

These requirements do not apply.

**63.6605 General Requirements**

- (a) The engine will comply with the emission and operating limitations at all times, except during periods of startup, shutdown and malfunction (SSM)
- (b) The engine, including air pollution control and monitoring equipment shall be operating in a manner consistent with good air pollution control practices for minimizing emissions at all times, including during SSM.

**63.6610 Initial performance test**

- (a) the performance tests specified in Table 4 (select sampling port and measure O<sub>2</sub>, moisture and formaldehyde at inlet and outlet of the control device) shall be conducted within 180 days of startup.
- (b) & (c) not applicable construction did not commence between 12/19/02 and 6/15/04.
- (d) previous performance tests have not been conducted on this unit within two years, therefore, this provision does not apply.

**63.6615 Subsequent performance tests**

Subsequent tests will be conducted as specified in Table 3. No additional testing is required for 4SRB engines meeting the formaldehyde percent reduction requirements.

**63.6620 Performance test procedures**

- (b) tests must be conducted at 100 % load plus or minus 10%
- (c) tests may not be conducted during periods of SSM.
- (d) must conduct three 1-hr test runs
- (e) equation (e)(1) shall be used to determine compliance with the percent reduction requirement.
- (f), (g) & (h) Not applicable
- (i) engine load during test shall be determined as specified in this paragraph.

### **63.6625 Monitoring, installation, operation and maintenance requirements**

- (a), (c) & (d) Not applicable
- (b) a continuous parameter monitoring system (CPMS) shall be installed to measure the catalyst inlet temperature. The CPMS will meet the requirements in § 63.8

### **63.6630 Demonstrating initial compliance**

- (a) initial compliance shall be determined in accordance with table 5 (initial performance test must indicate formaldehyde reduction of 76 percent or more, a CPMS must be installed to measure inlet temperature of the catalyst and the pressure drop and catalyst inlet temperature must be recorded during the initial performance test).
- (b) pressure differential will be established during the initial performance test.
- (c) Notification of compliance status will be submitted and will contain the results of the initial compliance demonstration.

### **63.6635 Monitoring to demonstrate continuous compliance**

- (b) except for monitor malfunctions, associated repairs, and required QA/QC activities monitoring must be continuous at all time the engine is operating.
- (c) data recorded during monitoring malfunctions, associated repairs and required QA/QC activities must not be used in data averages and calculations to report operating levels, however, all the valid data collected during other periods shall be used.

### **63.6640 Demonstrating continuous compliance**

- (a) continuous compliance will be demonstrated as specified in table 6 (collect catalyst inlet temperature data, reduce that data to 4-hr rolling average and maintain the 4-hr rolling averages to within the operating limitation and measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop meets the operating limitation.
- (b) deviations from the emission and operating limitations must be reported per § 63.6550.  
If catalyst is changed the operating parameters established during the initial performance test must be re-established.  
When operating parameters re-established a performance test must also be conducted.

### **63.6645 Notifications**

- (a) Submit notifications in §§ 63.7(b) & (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) thru (e) & (g) & (h) that apply by dates specified.
- (b) Not applicable. Acme unit started after effective dated for Subpart ZZZZ.
- (c) Submit initial notification within 120 days after becoming subject to Subpart ZZZZ.
- (d) thru (f) Not applicable. Acme engine greater than 500 hp and subject to requirements in Subpart ZZZZ.

- (g) & (h) Submit notification of intent to conduct performance test and notification of compliance status.

### **63.6650 Reports**

- (a) Submit reports required by table 7 (compliance report and SSM reports (if actions inconsistent with SSM plan)
- (b) Not applicable, an alternate schedule for report submittal has been approved. Reports will be submitted with title v reports
- (c) Compliance reports to contain the following information: company name and address, statement by responsible official certifying accuracy, date of report and beginning and end of reporting period, if SSM the information in 63.10(d)(5)(i), if no deviations a statement saying that, if no periods when CPMS out of control a statement saying that.
- (d) Not applicable, using CPMS
- (e) For each deviation the information in (e)(1) thru (e)(12) shall be provided.
- (f) Applicable. Compliance reports are submitted with title v reports. Compliance reports under Subpart ZZZZ include all necessary info for title v deviation report with respect to Subpart ZZZZ requirements.
- (g) Not applicable. Acme engine not firing landfill or digester gas.

### **63.6655 Recordkeeping**

- (a) Retain records as follows: copy of each notification and report (including all documentation supporting any initial notification or notification of compliance status), records in 63.6(e)(iii) thru (v) related to SSM, and records of performance tests and evaluations.
- (b) CPMS records including records in 63.10(b)(2)(vi) thru (xi), previous versions of the performance evaluation plan required by 63.8(d)(3) and requests for alternatives to the relative accuracy test for CPMS as required by 63.8(f)(6)(i).
- (c) Not applicable. Acme engine not firing landfill or digester gas.
- (d) Will keep records required in Table 6 (monthly pressure drop readings, 4-hr averages of catalyst inlet temperature) to show continuous compliance with emission and operating limits.

### **63.6660 Form and length of records**

- (a) records must be in a form suitable and readily available for expeditions review
- (b) records must be retained for five years
- (c) records must be retained on-site for first 2 years, may be retained off-site for the remaining 3 years

### **63.6665 General Provisions**

This engine must comply with the general provisions as indicated in Table 8.

## **CONCLUSION OF FINDINGS (EXAMPLE ONLY)**

Since this engine is subject to the requirements of MACT Subpart ZZZZ. The engine will be installed with a non-selective catalyst to meet the formaldehyde reduction requirement of 76% or more. An initial performance test will be conducted within 180 days of startup to demonstrate compliance with the formaldehyde percent reduction requirement. During the initial performance test, the pressure drop across the catalyst will be measured. A CPMS will be installed to measure the catalyst inlet temperature. Continuous compliance will be demonstrated by keeping the 4-hr rolling averages of catalyst inlet temperature within the operating limitations and recording the pressure drop across the catalyst monthly and demonstrating that the pressure drop is within the operating limitation.

Records, notifications and reports will be submitted as required. To that end required reports and notifications include initial notification, notice of intent to conduct performance test, notification of compliance status, SSM reports (if required) and semi-annual compliance reports.