ATTACHMENT II

PROPOSED CHANGES TO THE GUIDELINES
STRIKEOUT/UNDERLINE LANGUAGE

Attachment II
Strikeout/Underline Language of Changes to 2011 Carl Moyer Program Guidelines

Modifications to the Guidelines language are indicated by underlined text. Deletions to the language are indicated by ~~strikeout~~ text. The "*****" indicates the subsequent language in the section does not change. Revision numbers are provided in the left column for simple reference.

Chapter 2: GENERAL CRITERIA

2.1 General Criteria, Chapter 2, Section AA., page 2-3 Amend Section:

AA. Emission reduction technologies must be certified or verified by ARB. If an ARB certification or verification process does not exist or if engines or retrofits are preempted from ARB certification/verification, then an engine or retrofit must be certified/verified to Federal standards as applicable.

2.2 General Criteria, Chapter 2, Section HH., page 2-4 Amend Section:

HH. For repower and replacement projects, the replacement engine must achieve an annual NOx emissions benefit of at least 15 percent. ~~and be certified to, if available, either the current applicable emission standard or to a FEL NOx or NOx+NMHC level that is lower than the required emission standard.~~

2.3 General Criteria, Chapter 2, Section MM., page 2-5 Amend Section:

MM. Contracts executed after the adoption date of a regulation must consider all applicable regulations when determining eligibility for a project. If an existing contract is amended to increase the total Carl Moyer Program funding of the project, then the air district must reevaluate eligibility and consider all applicable regulations. If the total dollars ~~to~~ do not increase, then the air district does not need to reevaluate eligibility.

2.4 General Criteria, Chapter 2, Addition of Section OO., page 2-5 Add Section:

OO. Any funds earned or collected by the air district through Carl Moyer Program resources must be reported and either returned to ARB or spent on the air district's Carl Moyer program.

2.5 General Criteria, Chapter 2, Addition of Section PP., page 2-5 Amend Section:

PP. Any Carl Moyer grant funds lost due to air district investment choice will be replaced by the air district.

Attachment II
Strikeout/Underline Language of Changes to 2011 Carl Moyer Program Guidelines

Chapter 3: PROGRAM ADMINISTRATION

3.1 Program Administration, Chapter 3, Section G., page 3-6 to 3-7 Amend Section:

G. Fund Disbursements to Air Districts

1. In order to receive a disbursement, each air district must submit a Grant Disbursement Request to ARB. The Grant Disbursement Request form must be signed by a party authorized and designated by the air district's Governing Board.

2. If there are stipulations on the Grant Award and Authorization form, all stipulations must be met before ARB will disburse funds associated with the grant award.

3. Protocol and minimum requirements for air districts to receive disbursements are as follows:

(A) Initial Disbursement: An air district may request an initial disbursement that includes all of its administrative funds and up to ten percent or $200,000 of its project funds, whichever is greater. Minimum allocation air districts may request up to their entire allocation of $200,000. An air district has the option to request additional project funds to be included in the initial disbursement if they can meet and demonstrate all the criteria described in Section G.3.(B).

(B) Additional Disbursements: Air districts may request any remaining portion of their project funds once the following criteria have been met and submitted to ARB:

(1) Preceding Yearly Report demonstrates on-time expenditures consistent with Health and Safety Code section 44287(k).

-or -

The unexpended funds identified in the preceding Yearly Report have been received by ARB. <u>NOTE: ARB will not request a return of any funds under contract.</u>

(2) Program staff submission of document(s) listing eligible projects in an amount equal to the disbursement request, and confirming the air district's commitment of Carl Moyer Program funds to those projects.

(3) Program staff certification that an executed contract will not be entered prior to project being approved by the APCO or Board approved designee (for those air districts not requiring Board action) or air district Board (for those air districts requiring Board approval of projects) as consistent with their Policies and Procedures Manual.

(4) Air districts will receive one check for both program administration and project funds, but must account for the administration and project funds separately.

3.2 Program Administration, Chapter 3, Section H., pages 3-7 to 3-8 Amend Sections:

H. AB 923 - $2 Motor Vehicle Fee

1. State law allows air districts to collect an additional $2 motor vehicle registration surcharge (MV Fee) (Health & Safety Code § 44223), which must be used to fund the following (Health & Safety Code § 44229(b)):

   (A) Projects eligible for grants under the Carl Moyer Program.

   (B) The Agricultural Assistance Program.

   (C) Purchase of new school buses pursuant to the Lower-Emission School Bus Program.

   (D) An accelerated vehicle retirement or repair program that is adopted by ARB.

   (E) On-Board natural gas tank replacements in qualifying school buses.

   (F) Infrastructure improvements for deteriorating natural gas fueling dispensers.

   (G) Retrofits for qualifying school buses.

   Additional Change in Section H, Table 3-3, row six: "Fiscal reporting to ARB (list total funds expended in ~~four~~ seven basic categories)[2]"

2. $2 MV Fees used to meet the Carl Moyer Program match fund requirement (See Section I) are subject to the same eligibility, reporting, review and auditing requirements as State-provided Carl Moyer Program funds. $2 MV Fee funds used to meet the match requirement are not required to be expended within two years from the date of their collection. However, air districts must expend sufficient match funds to meet the obligations for the Carl Moyer Program funds received each year.

3. Amend Table 3-3:

Table 3-3
Summary of $2 MV Fee Requirements and Oversight

Requirements/ Oversight	$2 MV Fee Used as Match	$2 MV Fee Used for SIP Credit	$2 MV Fee Not Match/ not SIP
Expenditure of funds within two years	(1)	--	--
Meet full and complete Carl Moyer Program Guideline criteria	√	--	--
Subject to ARB ~~Audit~~ Program Review	√	--	--
Subject to ARB project eligibility evaluation (e.g., cost-effective and surplus)	√	√	√
Fiscal reporting to ARB (list total funds expended in four basic categories)[2]	√	√	√
Detailed reporting to ARB (project specifics submitted in current database)[2]	√	√	--

[1] Sufficient funds must be expended, regardless of their year of origin or source, to provide the required match by that year's expenditure timeline. For example, for Year 9, air districts must expend their match by June 30, 2009. When those funds were received is not a factor in determining this deadline.
[2] See Section R of this chapter for details.

3.3 Program Administration, Chapter 3, Section I.9., page 3-10 Amend Section:

9. Funding provided by a port authority or a local government for a qualifying project or for infrastructure that serves a qualifying project may count toward the air district's Carl Moyer Program matching fund requirement. However, in any air district granted more than $300,000 of the state board funds, no more than 30 percent of an air district's match obligation may come from a port authority or local government as identified in Health and Safety Code section 44287(e). Port authorities may participate through projects involving their own equipment, or by soliciting port tenants to apply for project funding.

3.4 a) Program Administration, Chapter 3, Section K.6, pages 3-13 to 3-14 Amend Section:

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6. Interest Documentation: Documentation of earned interest must be retained, at a minimum, until the liquidation deadline of the funding target with which it is associated (e.g., for interest earned from 6/30/2010 - 6/30/2011 and added to the Year 14 target, the funding year liquidation deadline is June 30, 2016). Documentation of projects funded with interest (i.e., the project files) must be retained for a minimum of ~~two~~ three years after the end of the contract term ~~or a minimum of three years after final payment, whichever is later~~. In the event final payment has not been issued prior to the end of the contract term, the three-year clock is re-started upon final payment.

b) Program Administration, Chapter 3, Section V.5.(A), page 3-25 Amend Section:

5. Air district responsibilities during an audit include the following:

(A) Air districts must ensure that program files and other requested information are readily available to audit staff. Unless otherwise specified for a specific source category, project files must be retained for a minimum of ~~two~~ three years after the end of the contract term ~~or a minimum of three years after final payment, whichever is later~~. In the event final payment has not been issued prior to the end of the contract term, the three-year clock is re-started upon final payment. Applications that were not selected for funding must be retained for a minimum of three years after receipt. Administrative records for a given funding year (including personnel documentation and records of various administrative expenses per Section L) must be retained, at a minimum, until the applicable funding year liquidation deadline (e.g., for Year 13 (fiscal year 2010-2011) funds, the funding year liquidation deadline is June 30, 2015).

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c) Program Administration, Chapter 3, Section X.6., page 3-28 Amend Section:

6. The air district must maintain a copy of each application and a file for each project selected for funding. An air district may use a solely electronic file system only if the air district satisfactorily demonstrates to ARB that all documentation is maintained and can be easily accessed on demand. Unless otherwise specified for a specific source category, project files must be retained for ~~two~~ three years after the end of the contract term ~~or a minimum of three years after final payment, whichever is later~~. In the event final payment has not been issued prior to the end of the contract term, the

three-year clock is re-started upon final payment.

d) Program Administration, Chapter 3, Section Z.10., page 3-35 Amend Section:

10. On-Site Inspections and Audits. All contracts must include language that allows the air district, ARB, or their designee to conduct a fiscal audit of the project and/or to inspect the project engine, vehicle, and/or equipment and associated records during the contract term. Contracts must require the owner to maintain and retain the project records for at least ~~two~~ three years after contract expiration. ~~or three years after final project payment, whichever is later.~~

3.5 Program Administration, Chapter 3, Section S.1., pages 3-20 and 3-21 Amend Section:

1. Any air district whose latest required Yearly Report does not demonstrate full expenditure of program funds within two years, must return the expenditure shortfall within 60 calendar days after the June 30th expenditure deadline (Health & Safety Code § 44287(k)). Funds under executed contract, though not expended, do not need to be returned to ARB (Health and Safety Code § 44291(d)).

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3.6 Program Administration, Chapter 3, Section T, page 3-21 to 3-22 Delete Section T and renumber subsequent sections:

~~T. Progress Questionnaire~~

~~1. Twice a year ARB will provide a questionnaire to each implementing air district requesting an update regarding air district progress towards meeting its contract execution and expenditure targets, measured cumulatively using the same calculation methods as used in the Yearly Report. ARB will include, for each air district's review, an update regarding the amount of grant funds remaining to be disbursed to the air district.~~

~~2. Each air district must submit their completed progress questionnaire to ARB on the first business day of April and December each year. At a minimum, the questionnaire must include the requested information through the end of February and October, respectively. Alternatively, air district staff may notify ARB in writing (e.g., email) that the air district has updated all project equipment and administrative information in CARL.~~

~~3. For contract execution reporting only, an air district may waive progress porting requirements if the air district is covered by a contingency plan to move uncommitted funds to RAP or to a partnering air district no later than March 1 prior to the expenditure deadline of the funding cycle (e.g., by March 1, 2011, for~~

~~Year 11 funds, which have a June 30, 2011, expenditure deadline). Contingency plans must receive air district board approval. Contingency plans involving participation of multiple air districts must be described in an MOU approved by all participating air district boards.~~

3.7 Program Administration, Chapter 3, Section V.3., page 3-23, Amend Section:

2. ARB shall audit a sufficient number of air districts each year ~~– commensurate with approximately 10 percent of program funds –~~ to ensure proper program implementation. ~~The goals for frequency of air district audits is as follows:~~

~~(A) Large air districts - every 4 years~~

~~(B) Medium air districts - every 6 years~~

~~(C) Small air districts - every 8 years~~

3.8 Program Administration, Chapter 3, Section W.3., page 3-26 Amend Section:

3. Information regarding previous years of existing engine usage (e.g. miles traveled, hours operated, or fuel consumed per year) must be documented and included in the project application. This information must be used to evaluate project cost-effectiveness and the maximum grant award amount. At the air district's option, minimum annual usage is not required to be specified in the contract for projects in which at least twenty-four (24) months of complete historical usage prior to the application date have been documented and verified by the air district. <u>If an applicant has been on active military duty at any time during the previous twenty four (24) months, documentation prior to deployment and covering the same length of time as the deployment period may be used to meet the title, registration, usage, and operation in California requirements as applicable for each source category. The applicant must submit a copy of DD Form 214, Certificate of Release or Discharge from Active Duty to verify military service during the deployment period.</u>

3.9 Program Administration, Chapter 3, Section BB.1.(C), page 3-38 Amend Section:

(C) The inspector must record, at a minimum, information regarding the new project engines, vehicles/equipment, and retrofit devices as needed to uniquely identify, establish eligibility, provide a basis for emission calculations, populate the CARL database, and ensure contract enforceability. Such information includes (as applicable), make, model, year, horsepower, fuel type, engine family, engine tier, serial number, VIN number, retrofit device certification level, and any additional information pertinent to the project. <u>Submersible pump inspections may have the applicant take a picture of the motor name plate information including, make, model, and serial number prior to</u>

installation inside the irrigation well. The district will verify the make, model and horsepower rating information with the project invoice.

3.10 Program Administration, Chapter 3, Section CC.11, page 3-42 Amend Section:

~~11.~~12. ~~For projects where the participant must~~ Where a contract requires a grantee to demonstrate that specific regulatory compliance requirements have been met, in order to receive funding (such as engines subject to the Portable Equipment ATCM), air districts may not pay invoices until the grantee has provided documentation that the requirements have been ~~achieved~~ met. A project participant may demonstrate this via a detailed letter signed by the vehicle or equipment owner or legal representative or, if the regulation requires ARB (or the air district) to certify compliance, through ARB (or air district) certification. For more information, see the associated category chapter. Air districts are not to be held liable if a grantee falsifies this documentation.

3.11 Program Administration, Chapter 3, Section EE.1, page 3-43 Amend Section:

EE.1. Air District Audit of Projects

Each calendar year, air districts must conduct audits of projects funded with Carl Moyer Program Funds (see definitions, including awarded project funds, interest earned on awarded administration or project funds, and local funds used as program match funding). The audits must, on an annual basis, include at least five percent of, or ~~30~~20, active projects (whichever is less)~~,~~: the district may include in this total the audits ~~and all~~ of the projects whose owners fail to submit their most recently required project annual report. The requirements of ~~as required in~~ Section DD of this chapter to audit all such projects also apply, even if the total projects audited exceed five percent of, or 20, active projects.

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3.12 Program Administration, Chapter 3, Section FF.4.(E), page 3-46 Amend Section:

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(E) Recalculate a project's cost-effectiveness based on the reported decrease in usage. Based on this recalculation, if the project is still below the cost-effectiveness cap, consistent with the cap and methodology in effect on the date of contract execution and prior to the end of the contract, the air district must continue to monitor the project over the next year to determine if additional actions are necessary. A waiver is not required in this event.

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Attachment II
Strikeout/Underline Language of Changes to 2011 Carl Moyer Program Guidelines

3.13 Program Administration, Chapter 3 Amend Various Sections:

I. Air District Match Funds

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8. Interest or other funds earned on Carl Moyer Program funds received from ARB must not be used for match funding. See Section K for more information on earned interest.

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J. Eligible Types of Match Projects

1. The types of projects that can be funded to meet the match funding requirement Include:

   (A) Carl Moyer Program Projects: Match funds may be used to pay for any project that meets all Carl Moyer Program criteria and all other statutory limitations on the funds such as those specified in Section I.6. of this chapter.

   (B) Incremental Fuel Cost: Match funds may be used to pay for the incremental cost of liquid or gaseous fuel and electricity, other than standard gasoline or diesel, which serves a Carl Moyer Program-eligible source category (such as heavy-duty trucks).

   (C) Infrastructure Projects:

      (1) Match funds may be used for electric and alternative fuel infrastructure projects that serve Carl Moyer Program qualifying project categories.

      (2) Motor vehicle fees authorized under Assembly Bill (AB) 2766 and AB 923 can be used to fund infrastructure projects that serve Carl Moyer Program qualifying project categories. However, of these, only infrastructure projects that serve Carl Moyer Program qualifying motor vehicle project categories can be counted towards the air district's match requirements. Table 3-4 in Section I lists eligible and ineligible motor vehicle project types.

2. In-Kind Contributions: Up to 15 percent of an air district's match requirement may be fulfilled through in-kind contributions (Health & Safety Code § 44287(h)). Air districts may use any funds under their budget authority -- except for Carl Moyer Program administrative funds and interest or other funds

earned on Carl Moyer Program funds -- to cover their in-kind contribution. When using air district funds for in- kind match, air districts must follow all relevant statute, guidelines, and other legal requirements for expending such funds. In-kind contributions have the same expenditure timeline as match funds. Air district in-kind match funds spent on program administration and outreach must meet the documentation requirements identified in Section L.

3. Air districts found by ARB to have funded ineligible projects must substitute eligible projects, using eligible match funds as describe in Section I, equal to the amount found ineligible.

K. Earned Interest

1. Interest or other funds earned on Carl Moyer Program funds must be reported to ARB. The ~~interest~~ funds earned must either be used to fund projects that meet the current Carl Moyer Program Guidelines (including any revisions in effect at the time of contract execution) or be returned to ARB.

Calculation of Earned Interest: All air districts must maintain accounting records (e.g., general ledger) that track interest earned and expended on Carl Moyer Program funds.

(A) If an air district maintains its Carl Moyer Program funds in a non-segregated account, the air district must maintain accounting records that track the revenue, expenditures, and interest earned by the Carl Moyer Program funds separately from other air district programs.

(B) The calculation of interest must be based on an average daily balance or some other reasonable and demonstrable method of allocating the proceeds from the fund back into the program.

(C) Each air district's methodology for calculating Carl Moyer Program interest must be consistent with how it calculates earned interest for its other fiscal programs.

2. Expenditures for Carl Moyer Program Projects: All projects funded with interest or other funds generated through the Carl Moyer program must meet all the Carl Moyer Program Guidelines current at the time of contract execution, including any revisions to those Guidelines in effect at the time of contract execution.

3. Expenditures for Program Administration: An air district can use up to five percent of earned interest or other funds generated through the Carl Moyer Program on administrative expenses if the air district has one million or more inhabitants and up to ten percent of earned interest on administrative

expenses if the air district has less than one million inhabitants, in accordance with Health and Safety Code section 442991(c).

4. Reporting Requirements: Each air district must report on interest and other funds generated through the Carl Moyer program in Yearly Reports to ARB using the format provided by ARB.

   (A) Air districts must report on projects funded with earned interest or other funds earned through the Carl Moyer program the same way air districts report on Carl Moyer Program-funded projects (i.e., by entering projects in the CARL and in their Yearly Reports).

   (B) In the 2010 Yearly Report, for the period of July 1, 1998, through June 30, 2010, air districts reported interest earned on Carl Moyer Program, Rural District Assistance Program, and Multi-district fund balances by listing the following:

      (1) Earned interest that was liquidated on Carl Moyer Program projects.

      (2) Earned interest that was expended on Carl Moyer Program administration.

      (3) Balance of earned interest held by the air district on June 30, 2010, including those interest funds committed to projects but not yet liquidated. For this balance, air districts were provided the following options:

         a. Spend that amount on Carl Moyer Program projects and administration (consistent with Section K.3. and K.4.) on the same schedule as the air district's Year 13 Carl Moyer Program grant award. For reporting purposes, such interest funds were added to the Year 13 Carl Moyer Program funds and counted in the Year 13 cumulative contract execution and fund expenditure targets tracked by clean air reporting log (CARL).
            -or-

         b. Return unspent interest to ARB by October 31, 2010.
            -or-

         c. A combination of (a.) and (b.).

   (C) Beginning with the 2011 Yearly report (due on August 29, 2011), and for each Yearly Report thereafter, air districts must report interest earned during the previous fiscal year (i.e. July 1 through June 30). Beginning with the 2014 Yearly report (due August 29, 2014), and for each Yearly Report thereafter, the same policy applies to any other funds generated through the Carl Moyer program. For such interest

and other funds earned the previous fiscal year, air districts may choose from the following options:

(1) Add the earned ~~interest~~ funds to the next funding year and spend it on Carl Moyer Program projects and administration (consistent with Section K.3. and K.4.) on the same schedule as other Carl Moyer Program funds in that funding year. For example, ~~interest~~ funds earned during fiscal year 2010- 2011 (Moyer Year 13) may be added to an air district's 2011-2012 (Year 14) funds, placing those interest funds under the same contract execution and expenditure schedule as other Year 14 funds.
-or-

(2) Return the ~~interest~~ funds to ARB by October 31 of the same year as the relevant Yearly Report. For example, interest earned during fiscal year 2010-2011 (Moyer Year 13) and reported in the 2011 Yearly Report should be returned to ARB by October 31, 2011.
-or-

(3) A combination of (1) and (2).

6. Interest and Other Earned Funds Documentation: Documentation of earned interest and other earned funds must be retained, at a minimum, until the liquidation deadline of the funding target with which it is associated (e.g., for ~~interest~~ funds earned from 6/30/2010 - 6/30/2011 and added to the Year 14 target, the funding year liquidation deadline is June 30, 2016). Documentation of projects funded with ~~interest~~ earned funds (i.e., the project files) must be retained for a minimum of two years after the end of the contract term or a minimum of three years after final payment, whichever is later.

3.14 a) Program Administration, Chapter 3, Section D.5., page 3-5 Amend Section:

5. An air district receiving RAP projects and funds must have a current approved Carl Moyer Program Policy and Procedures manual. Following project acceptance, the air district is fully responsible for all grant obligations, including eligibility verification, contract draft and execution, inspections, monitoring and reporting. RAP projects will be subject to ~~audit~~ review as part of the ~~audit~~ Incentives Program Review ("Program Review" or "review") of the implementing air district.

b) Program Administration, Chapter 3, Section E.3., page 3-5 Amend Section:

3. ARB shall review an air district's Policies and Procedures Manual for minimum elements listed in Section C.2. of this chapter and within 30 days of its receipt either approve the manual or describe what additional information or clarification is needed. ARB approval of an air district's Policies and Procedures Manual shall be provided by email or in other written format. Once approved, the air district must submit a statement that an updated version of their Policies and Procedures Manual is maintained on-site. In this case, an annual submittal of their Policies and Procedures Manual with the application for funding is no longer required. ARB approval of an air district's Policies and Procedures Manual denotes approval of the air district's policies and procedures as written. An air district's policies and procedures as implemented can only be fully evaluated during the ~~audit~~ Program Review process.

c) Program Administration, Chapter 3, Section H. Table 3-3, pages 3-7 to 3-8 Amend Section:

2. $2 MV Fees used to meet the Carl Moyer Program match fund requirement (See Section I) are subject to the same eligibility, reporting, review and auditing requirements as State-provided Carl Moyer Program funds. $2 MV Fee funds used to meet the match requirement are not required to be expended within two years from the date of their collection. However, air districts must expend sufficient match funds to meet the obligations for the Carl Moyer Program funds received each year.

3. Reporting and oversight of the $2 MV Fee depends upon whether the fee is used to meet the Carl Moyer Program's match requirement and whether the air district takes SIP credit for $2 MV Fee projects. Table 3-3 summarizes the various scenarios for treatment of $2 MV Fee funds and projects. Sections R and V.6. of this chapter, respectively, describe reporting and oversight on the $2 MV Fee in more detail.

Table 3-3
Summary of $2 MV Fee Requirements and Oversight

Requirements/ Oversight	$2 MV Fee Used as Match	$2 MV Fee Used for SIP Credit	$2 MV Fee Not Match/ not SIP
Expenditure of funds within two years	(1)	--	--
Meet full and complete Carl Moyer Program Guideline criteria	√	--	--
Subject to ARB ~~Audit~~ Program Review	√	--	--
Subject to ARB project eligibility evaluation (e.g., cost-effective and surplus)	√	√	√
Fiscal reporting to ARB (list total funds expended in four basic categories)[2]	√	√	√
Detailed reporting to ARB (project specifics submitted in current database)[2]	√	√	--

[1] Sufficient funds must be expended, regardless of their year of origin or source, to provide the required match by that year's expenditure timeline. For example, for Year 9, air districts must expend their match by June 30, 2009. When those funds were received is not a factor in determining this deadline.
[2] See Section R of this chapter for details.

d) Program Administration, Chapter 3, Section L.4. page 3-15 Amend Section:

4. The documentation, records, and referenced materials described in Section L.3. must be made available for review during ARB or other State agency monitoring visits, reviews and audits. Such administrative records for a given funding year must be retained, at a minimum, until the applicable funding year liquidation deadline [e.g., for Year 13 (fiscal year 2010-2011) funds, the funding year liquidation deadline is June 30, 2015].

e) Program Administration, Chapter 3, Section U.1., page 3-22 Amend Section:

U. Program Non-Performance

1. Program non-performance is air district non-compliance with program Guidelines or statute that is not corrected by the air district in a timely or satisfactory fashion. As directed by Health and Safety Code section 44291(d), ARB shall monitor air district programs to ensure that participating air districts conduct their programs consistent with the criteria and guidelines established by the state board. ARB may become

aware of possible air district non-performance through program reports, audit, Program Reviews of air districts, or other means. Examples of program non-compliance with program Guidelines or statute include:

(A) Failure to return to ARB a check for the expenditure shortfall identified by the Yearly Report (Health & Safety Code § 44287(k)).

(B) Misuse of Carl Moyer Program funds, including funding of ineligible projects.

(C) Insufficient or improper program oversight and enforcement, including widespread deficiencies in project contracting, inspections, reviews or audits.

(D) Insufficient, incomplete, or inaccurate project documentation.

(E) Failure to submit timely and accurate reports to ARB.

f) Program Administration, Chapter 3, Section V.1.-V.6., pages 3-23 to 3-25 Amend Section:

1. State law assigns ARB the responsibility and authority to oversee ~~and audit~~ Carl Moyer Programs and related emission reduction incentive programs as identified in Health and Safety Code section 44291 and Health and Safety Code section 39500. ARB ~~audits~~ conducts Program Reviews ~~help~~ to ensure that air district programs achieve expected emission reductions and are implemented in a manner consistent with program guidelines and State law. ARB may also contract with the State Department of Finance to conduct fiscal compliance audits of air district records within the scope of the Program Review. ARB retains final authority with respect to corrective measures and follow-up. Besides identifying program deficiencies, ~~audits~~ Incentives Program Reviews also provide a mechanism for identifying the strengths of air district programs. ARB's specific ~~audit~~ oversight procedures are described in more detail in the Carl Moyer and School Bus Programs Auditing Policies and Procedures posted on the Carl Moyer Program website: http://www.arb.ca.gov/msprog/moyer/audits/audits.htm.

2. ARB shall ~~audit~~ review a sufficient number of air districts each year – commensurate with approximately 10 percent of program funds -- to ensure proper program implementation. The goals for frequency of ~~air district audits~~ Incentives Program Reviews are ~~is~~ as follows:

(A) Large air districts - every 4 years

(B) Medium air districts - every 6 years

(C) Small air districts - every 8 years

3. To ensure objectivity and the efficient use of resources, ARB shall use a risk-based approach to select specific air districts for ~~audit~~ Program Review during a given year and to select specific air district projects to ~~audit~~ review. Consistent with this approach, air districts that demonstrate good performance when ~~audited~~ reviewed will likely be ~~audited~~ reviewed less frequently in the future than similarly-funded air districts with poorer Program Review results.

4. ARB's responsibilities during an ~~audit~~ Incentives Program Review include the following:

   (A) ~~Audits~~ Program Reviews shall be conducted in a manner that reflects the public responsibility and accountability entrusted to ARB.

   (B) ARB shall generally limit the scope of ~~an audit~~ a Program Review to cover the two most recently-completed funding years and the two years currently in progress. For example, ~~an audit~~ a Program Review initiated April 2010 would typically cover Year 8 (completed June 30, 2008), Year 9 (completed June 30, 2009), and Years 10 and 11 (in progress).

   (C) Once a given funding year is ~~audited~~ reviewed, ARB will typically not ~~audit~~ review it again unless warranted. ARB reserves the right to investigate possible fraud or misuse of funds in any program year.

   (D) ARB shall maintain open channels of communication with the air district under ~~audit~~ review. ARB's ~~audit~~ Incentives Program Review procedures contain a number of provisions to enable open communications. Such provisions include fully explaining the ~~audit's~~ review's scope and procedure at the beginning of the process, discussing preferred channels of communication with the air district, informing the air district of potential issues as they unfold, affording numerous opportunities for air district input throughout the ~~audit~~ review, thoroughly discussing any findings and recommendations with the air district during the exit interview, and allowing the air district an opportunity to formally respond to the ~~audit~~ Incentives Program Review report.

   (E) To ensure objectivity and predictability, ARB shall base its findings and recommendations on materials such as State law, ARB's Program Guidelines and Mail-Outs, Program Grant Award and Authorizations, email communications between ARB and the air district, an air district's Policies and Procedures Manual, and an air district's local requirements.

   (F) All ~~audit~~ Incentives Program Review reports, air district responses, and related documents shall be made available to the public via web posting at ARB's Carl Moyer Program website.

(G) ARB shall conduct sufficient follow-up activities, including assisting air districts and conducting follow-up reviews, to ensure that any identified deficiencies are promptly and effectively mitigated.

5. Air district responsibilities during an ~~audit~~ Incentives Program Review include the following:

   (A) Air districts must ensure that program files and other requested information are readily available to ~~audit~~ Incentives Program Review staff. Unless otherwise specified for a specific source category, project files must be retained for a minimum of two years after the end of the contract term or a minimum of three years after final payment, whichever is later. Applications that were not selected for funding must be retained for a minimum of three years after receipt. Administrative records for a given funding year (including personnel documentation and records of various administrative expenses per Section L) must be retained, at a minimum, until the applicable funding year liquidation deadline (e.g., for Year 13 (fiscal year 2010-2011) funds, the funding year liquidation deadline is June 30, 2015).

   (B) Air district management must, at a minimum, participate in the entrance and exit interviews and ensure that air district staff is cooperative with ~~audit~~ Incentives Program Review staff.

   ~~(C)~~ Air district staff must communicate fully with ~~audit~~ Incentives Program Review staff and with air district management throughout the course of ~~an audit~~.a review.

   (D) If deficiencies are identified during the ~~audit~~ review, air districts must make every effort, including requesting assistance from ARB if necessary, to ensure that the identified deficiencies are fully mitigated. Air districts must report on their progress at specified intervals.

6. AB 923 $2 MV Fee projects are subject to ~~audit~~ Program Review or evaluation as follows:

   (A) A Carl Moyer Program match project funded with the AB 923 $2 MV Fee will be subject to the same ~~auditing~~ review and oversight requirements and protocols as other Carl Moyer Program match projects.

   (B) A non-match project funded with the AB 923 $2 MV Fee may be evaluated by ARB in conjunction with ~~an audit~~ a Program Review. Evaluation of these projects shall be limited to project eligibility. Any irregularities regarding non-match AB 923 $2 MV Fee project eligibility must be reported separately from Carl Moyer Program ~~audit~~ Incentives Program

Review findings.

g) Program Administration, Chapter 3, Section Y.6., page 3-31 Amend Section:

6. Air districts must keep a copy of the determination, either approved or not approved, in the project file. Written case-by-case approval for other program elements must be kept by an air district with the air district Policies and Procedures manual and be readily available for ARB ~~audit~~ Program Review staff.

h) Program Administration, Chapter 3, Section DD.4., page 3-43 Amend Section:

4. If an annual report is incomplete, inaccurate or not received from the grantee on schedule, the air district will make a reasonable attempt to obtain a complete and accurate report from the grantee. If the air district is unable to obtain the report, the air district must ~~audit~~ review all of the engines in that project, as per Section EE.

Chapter 6: EMERGENCY EQUIPMENT

6.1 Emergency Vehicles, Chapter 6, Section C.1.(A), page 6-1 Amend Section:

(A) Eligible Vehicles: ~~Fire apparatus~~Authorized emergency vehicle as described in the California Vehicle Code, sections 27156.2 and 165 including but not limited to pumpers, ladder trucks and water tenders are eligible for funding.

6.2 Emergency Vehicles, Chapter 6, Section C.1.(D), page 6-2 Amend Section:

(D) ~~MHD Intended Service Class Flexibility: Engines certified to the MHD service class (i.e., GVWR between 14,000 and 33,000 pounds) must be installed in a MHD vehicle as shown on the engine certification EO. However, MHD engines may be installed in a vehicle with a GVWR up to 39,601 pounds (20 percent higher than 33,000 GVWR) with written warranty verification by the engine and chassis manufacturer. A copy of the written warranty verification must be maintained in the air district project file.~~

Engine Class: The engine's intended service class and the vehicle's weight class must match (i.e., a medium heavy-duty diesel engine is used in a vehicle with a GVWR of 19,501- 33,000 pounds and a heavy heavy-duty diesel engine is used in a vehicle with a GVWR greater than 33,000

pounds). As an exception, a heavy heavy-duty engine may be installed in a medium heavy-duty vehicle if necessary for vocational purposes but only if the gross vehicle weight rating is within ten (10) percent of the engine's intended service class (i.e., GVWR of 29,701 lbs or greater).

6.3 Emergency Vehicles, Chapter 6, Section C.1.(F), page 6-2 Amend Section:

(F) Eligible Project Cost: A Carl Moyer Program grant for a fire apparatus project shall not exceed a maximum of 80 percent of the eligible project cost. Eligible project costs include the cost of the cab and chassis ~~and do not include the specialized equipment such as the ladder or pumper~~. The cab and chassis cost may include but is not limited to the following: **********

6.4 Emergency Vehicles, Chapter 6, Section C.3.(B), page 6-4 Amend Section:

(B) Usage: Participant must submit documentation of the annual gallons consumed or miles traveled for the previous two years to determine cost-effectiveness. Examples of acceptable documentation include: fuel logs, fuel receipts, or maintenance records. ~~Fuel log information must be provided electronically in a spreadsheet ready format.~~ Other methods of documenting usage may be considered on a case-by-case basis.

6.5 Emergency Vehicles, Chapter 6, Section C.5.(A), page 6-5 Amend Section:

(A) Engine Certification: New or used replacement vehicle with a 2007 model year or later engine, certified to a particulate matter (PM) emission standard of 0.01 g/bhp-hr and a oxides of nitrogen (NOx) family emission limit (FEL) or NOx standard (STD) level of 1.20 grams per brake horsepower hour (g/bhp-hr) or lower are eligible for funding ~~up to January 1, 2013. After January 1, 2013 replacement vehicles must be a 2010 model year or later engine, certified to PM emission standard of 0.01 g/bhp hr and a NOx FEL or NOx STD level of 0.2 g/bhp hr or lower~~.

Chapter 7: OFF-ROAD COMPRESSION IGNITION EQUIPMENT

7.1 a) Off-Road Compression Ignition Equipment, Chapter 7, Section A, page 7-1 Amend Section:

A. Projects Eligible for Funding

The Air Resources Board (ARB) has adopted in-use fleet rules affecting off-road CI equipment: the Regulation for In-Use Off-Road Diesel-Fueled

Fleets ~~Vehicle Regulation~~ (Off-Road Regulation) and the Cargo Handling Equipment at Ports and Intermodal Rail Yards Regulation (CHE Regulation). Portable engines are regulated under the Portable Airborne Toxic Control Measure (ATCM). There are limited funding opportunities for equipment subject to these rules.

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b) Off-Road Compression Ignition Equipment, Chapter 7, Section A, Table 7-1, page 7-1 Amend footnote 3 of Table 7-1:

****

[3] Regulation for In-Use Off-Road Diesel-Fueled Fleets ~~Vehicles~~
http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm

****

c) Off-Road Compression Ignition Equipment Chapter 7, Section E, page 7-10 Amend Section:

E. Projects Subject to the Regulation for In-Use Off-Road Diesel-Fueled Fleets ~~Vehicle Regulation~~

****

3. Eligibility for a project is based on the best available control technology (BACT) requirements of the Regulation for In-Use Off Road Diesel-Fueled Fleets ~~off-road regulation~~.

****

8. For more information on eligibility of off-road diesel equipment, please see the Regulation for In-Use Off-Road Diesel-Fueled Fleets ~~Vehicles Regulation~~ Carl Moyer Program Implementation Chart available at http://www.arb.ca.gov/msprog/moyer/guidelines/supplemental-docs.htm

****

7.2 Off-Road Compression Ignition Equipment, Chapter 7, Section D.1.(B), and (C) page 7-5 Amend Sections:

D. Project Criteria

****

(B) ~~Propulsion e~~Engines greater than 25 horsepower on mobile and portable off-road equipment are eligible for funding.

(C) Air Districts have discretion to use good engineering judgment to determine the project horsepower for an engine based on the engine label, manual, and engine records, or other verifiable records. For projects in which the actual engine horsepower cannot be determined based on information listed above ~~the engine label, manual, and engine records,~~ the engine horsepower can be estimated by the following formula: Engine hp = Power Take Off hp X 120 percent.

****

7.3 Off-Road Compression Ignition Equipment, Chapter 7, Section D.1.(F), page 7-6
Amend Section:

(F) For equipment with baseline engines manufactured under the flexibility provision, detailed in California Code of Regulations, title 13, section 2423(d), baseline emission rates shall be determined by using the previous applicable Tier emission standard for that engine model year and horsepower rating. Alternatively, the baseline emission rates may be determined based upon the standard or Tier associated with the actual reference engine family listed on the emission control information label of the baseline equipment. The ARB Executive Order for these engines indicates that the engines are certified under the flexibility provision~~this provision~~. Air districts must retain this documentation in the project file.

7.4 Off-Road Compression Ignition Equipment Chapter 7, Section D.1., page 7-6
Amend Section:

1. General Off-Road CI Equipment Project Criteria

****

(K) Cost-effectiveness calculations must use the hour-based formula as discussed in Appendix C. Fuel usage may only be used with case-by-case approval from ARB. If using the fuel based formula, usage must be based on two years of historical fuel usage documentation specific for the equipment being funded. Documentation may include fuel logs, purchase receipts, or ledger entries.

~~(K)~~(L) Future annual hours of equipment operation for determining ~~Project~~ emission reductions must be based upon readings from an installed and fully operational hour meter. If equipment does not have a functioning hour meter at the time of the project, the hour meter must be installed, repaired, and/or replaced. If during the project life the hour meter fails for any reason, the hour meter must be repaired or replaced as soon as possible at the owner's cost. ~~Alternatively, i~~If case-by-case approval was provided ~~fuel usage has been approved~~ by ARB to use fuel usage for

determining emission reductions, then future annual fuel usage must be based on fuel logs, purchase receipts, or ledger entries specific to the funded equipment.

7.5 Off-Road Compression Ignition Equipment Chapter 7, Section D.1.(I), Delete Section (I) page 7-6, add New Section (I):

1. General Off-Road CI Equipment Project Criteria

****

~~(I) The only forklifts eligible for funding under this chapter are Class 7 diesel forklifts. The air district must obtain and verify documentation of the classification of the forklift prior to funding.~~

(I) New replacement engines manufactured under the "replacement engine" provisions of CCR, Title 13, Section 2423(j) and/or the provisions of 40 CFR 1068.240 are eligible for Carl Moyer Program funding.

****

7.6 Off-Road Compression Ignition Equipment Chapter 7, Section D.1., page 7-6 Add New Section:

1. General Off-Road CI Equipment Project Criteria

****

(M) Project load factors for calculating emission reductions and cost-effectiveness are listed in Appendix D, Table D-10. Load factors shall be selected by first choosing the equipment category (i.e., Airport GSE, Mobile Agriculture, Construction, etc.), then by selecting the equipment type within the category. This is consistent with how the equipment category and load factor inputs are selected in CARL.

7.7 Off-Road Compression Ignition Equipment Chapter 7, Section D.2.(C), page 7-7 Amend Section:

(C) Engines eligible for repowers must meet the current applicable standard or Tier. If repowering with an engine meeting the current applicable standard is technically infeasible, unsafe, or not available when the air district commits to the proposed project, the replacement engine must meet the most practicable previously applicable emission standard. For purposes of this section, air district's commitment to a proposed project shall be consistent with that stated in their policies and procedures manual. The air district shall determine eligibility of a repower project using an engine

certified to a previous emission standard using the criteria listed below ~~by one of the following options~~:

****

7.8 a) Off-Road Compression Ignition Equipment Chapter 7, Section D.2.(D)(1), page 7-8 Amend Sections:

(1) In a fleet meeting the small fleet definition or a fleet meeting the captive attainment area fleet definition of the Off-Road Regulation until January 1, 2016. After this date, Tier 1 engines cannot be installed and are no longer eligible.

b) Off-Road Compression Ignition Equipment Chapter 7, Section D.2.(E)(1) and (2), page 7-8 Amend Sections:

(E) Notwithstanding Section D.2.(C), repower to a Tier 2 is eligible for funding in the following cases:

(1) In a fleet meeting the large or medium fleet definition of the Off-Road Regulation until January 1, 2018. After this date, Tier 2 engines cannot be installed and are no longer eligible.

(2) In a fleet meeting the small fleet definition or a fleet meeting the captive attainment area fleet definition of the Off-Road Regulation until January 1, 2023. After this date, Tier 2 engines cannot be installed and are no longer eligible.

****

7.9 a) Off-Road Compression Ignition Equipment, Chapter 7, Section D.2.(G)(3), page 7-9 Amend section (D), add subsections:

(3) If offered by an air district, an applicant may opt-out of the default retrofit requirement. Applicants must sign a waiver acknowledging that due to current or future regulations, the applicant may be required to install a retrofit on the funded equipment at their own cost. Air districts have the option to not offer this additional flexibility and are encouraged to evaluate individual projects based on the near-source health impacts. Large fleets subject to the Off-Road Regulation have additional requirements per section E.4.(D) below.

b) Off-Road Compression Ignition Equipment, Chapter 7, Section E.4.(D), page 7-12 Amend Section:

(D) Eligible projects for large fleets must include a particulate matter filter ~~retrofit~~ beginning January 1, 2013, for engines 75 horsepower and greater and January 1, 2014, for engines less than 75 horsepower. The retrofit waiver option in section D.2.(G)(3) is no longer available to projects involving large fleets after the dates specified above.

(1) Eligibility shall be determined at the time the air district commits to the proposed project. For purposes of this section, an air district's commitment to a project shall be consistent with that stated in its policies and procedures.

(2) If the air district and the applicant do not have an executed contract within six months of project commitment, then the project must include a particulate matter filter in order to be eligible. Alternatively, engines which are certified to the Tier 4 final particulate matter standard or which are certified to a FEL at or below the Tier 4 final particulate matter standard numerical level remain eligible after the dates listed in E.4.(D) above.

7.10 Off-Road Compression Ignition Equipment, Chapter 7, Section E.1.(A), page 7-11 Amend Section:

(A) Applicants must submit information regarding fleet size and compliance status. ~~This must include the Diesel Off-Road On-line Reporting System (DOORS) ID of the fleet and the DOORS Equipment Identification Number (EIN) of the funded equipment.~~ All documentation submitted must be signed and dated by the applicant and include language certifying that the fleet list provided is accurate and complete. Air districts are not required to validate submitted information and will not be held liable if fleet owners falsify fleet information.

(1) The following information must be submitted at the time of application:
   a. The Diesel Off-Road On-line Reporting System (DOORS) ID of the fleet
   b. The DOORS Equipment Identification Number (EIN) of the funded equipment.
   c. Fleet size information (total horsepower) as reported to DOORS.
   d. Information to determine compliance with the Off-Road Regulation.
      1. Prior to 1/1/2014, large fleets are not required to show compliance with the Off-Road Regulation.
      2. Prior to 1/1/2017, medium fleets are not required to show compliance with the Off-Road Regulation.
      3. Prior to 1/1/2019, small fleets are not required to show compliance with the Off-Road Regulation.

~~(1) Applicants should use the online fleet average calculator (http://arb.ca.gov/msprog/ordiesel/documents/documents.htm) to determine their fleets' compliance status and submit the information to the air district.~~

****

7.11 Off-Road Compression Ignition Equipment, Chapter 7, Section G.2., page 7-13 Amend Section:

2. Diesel engines regulated under the Portable Engine ATCM must be registered (or permitted) in an air district to be eligible for repower projects unless documentation from the air district is included in the project file stating that a registration (or permit) is not required to operate in their air district. ~~If portable diesel engines are required by the air district to be registered or permitted then, these engines must have registration or permits to be eligible for engine repowers.~~

7.12 Off-Road Compression Ignition Equipment, Chapter 7, Section G.4., page 7-14 Amend Section:

4. An existing Tier 1 or Tier 2 engine subject to the Portable Engine ATCM and subject to SBx2 3 may use a 10 year project life and may be eligible for funding up to the compliance date of an applicable in-use rule. ~~Uncontrolled portable engines owned by rental companies are not eligible for Carl Moyer Program funding due to the Portable Engine ATCM compliance dates of January 1, 2010, and January 1, 2011.~~

7.13 Off-Road Compression Ignition Equipment, Chapter 7, Section G.6 and G.7., page 7-14 Add new Section 6. And renumber all subsequent sections:

G. Projects Subject to the Portable Engine ATCM

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6. Retrofit projects for engines regulated under the Portable Engine ATCM that control particulate matter (PM) must use the highest level technically feasible technology available for the equipment being retrofitted. ARB considers the retrofit device that achieves the highest level of PM reductions (level 3 - 85 percent) and the highest level of NOx reductions to be the highest level retrofit.

7. For more information on eligibility of engines used in portable equipment, please see the Portable Engine Airborne Toxic Control Measure Implementation Chart

available at: http://www.arb.ca.gov/msprog/moyer/guidelines/supplemental-docs.htm.

Chapter 9 Off-Road Equipment Replacement

9.1 Off-Road Equipment Replacement, Chapter 9, Section C.2.(B), page 9-3
Amend Section:

(B) For old equipment with engines manufactured under the flexibility provision detailed in California Code of Regulations, title 13, section 2423(d), baseline emission rates shall be determined by using the previous applicable Tier emission standard for that engine model year and horsepower rating. Alternatively, the baseline emission rates may be determined based upon the standard or Tier associated with the actual reference engine family listed on the emission control information label of the baseline equipment. The Air Resources Board (ARB) Executive Order for these engines indicates that the engines are certified under the flexibility provisions~~this provision~~. Air districts must retain this documentation in the project file.

9.2 Off-Road Equipment Replacement, Chapter 9, Section C.3.(A)(1), page 9-5 Add Section and renumber all subsequent sections:

(1) At an air district's discretion, an air district may check availability of equipment with a current Tier engine at the dealers located within the geographical boundaries of the air district. If equipment with a current Tier engine is not available at those dealers, equipment with the previous applicable Tier engine may be purchased. An air district without equipment dealerships located within its boundaries may check availability of equipment with current Tier engines at the dealership or equipment manufacturer nearest to the applicant.

9.3 Off-Road Equipment Replacement, Chapter 9, Section C.3.(A)(6), page 9-6
Delete Section and renumber all subsequent sections:

3. Replacement Equipment Requirements

****

~~(6) The engine in the replacement equipment must be certified to an oxides of nitrogen (NOx) emission standard that is at least 15 percent lower than the emission standard(s) applicable to the existing engine certified to either the current applicable emission standard or to a FEL NOx or~~

~~NOx+non-methane hydrocarbons (NMHC) level that is lower than the required emission standard.~~

****

9.4 Off-Road Equipment Replacement, Chapter 9, Section C.3.(D), page 9-7
Amend Section: Insert new section (D) and renumber all subsequent sections.

3. Replacement Equipment Requirements

****

(D) Air districts have discretion to use good engineering judgment to determine project horsepower for an engine or equipment based on the engine label, manual, engine records, or other verifiable records.

****

9.5 a) Off-Road Equipment Replacement, Chapter 9, Section C.1.(F)(1), page 9-3
Amend Section (1):

(F) The replacement of two (or more) pieces of old, like equipment with one piece of replacement equipment is eligible for funding. Each piece of old existing and replacement equipment must comply with all of the appropriate criteria below. The replacement equipment must execute the same job as the old pieces of equipment. For baseline emissions calculation, the annual emissions of the two pieces of old equipment are summed. For the replacement equipment emissions calculation, the annual usage of the two pieces of old equipment is summed for the replacement equipment usage.

(1) The horsepower rating for the replacement equipment must not be greater than 125 percent of the original manufacturer rated horsepower (baseline horsepower) for the lowest horsepower of the existing equipment engine. For air districts that allow equipment with horsepower greater than 125 percent to be funded, the applicant must pay the additional costs associated with the higher horsepower equipment, the emission reduction calculation must be based upon the funded (higher horsepower) equipment and documentation must be included in the project file as described in section C.3.(D)(1) of this chapter.

b) Off-Road Equipment Replacement, Chapter 9, Section C.3.(D), page 9-7
Add new Section (1):

(D) The hp rating for the replacement equipment engine must not be greater than 125 percent of the original manufacturer rated hp (baseline hp) for the old (existing) equipment engine. In limited situations, such as where

equipment in the original hp range is not available or the higher hp equipment will result in equal or less annual emissions, the air district may approve a greater than 25 percent increase in hp. Documentation must be provided that the replacement equipment will serve the same function as the old equipment.

(1) Alternatively, at an air district's discretion, equipment may be funded with horsepower greater than 125% of existing equipment. However, the eligible funding amount must be based upon equipment whose horsepower is no higher than 125% of the old equipment horsepower. The applicant is required to pay the additional equipment costs associated with the higher horsepower equipment. The emission reduction calculations shall be based upon the funded (higher horsepower) equipment. Air districts that choose to fund higher horsepower equipment must document in the project file the equipment cost of the funded (higher horsepower) equipment as well as the method used to determine the basis for the project grant amount (e.g. dealership cost estimate of lower horsepower equipment).

9.6 Off-Road Equipment Replacement, Chapter 9, Section C.3.(G), pg. 9-8 Delete Section and renumber all subsequent sections:

~~(G) The participant may obtain financing to assist in the purchase of replacement equipment. Documentation of financing must be provided to the air district.~~

9.7 a) Off-Road Equipment Replacement, Chapter 9, Section C.3.(H)(6), pg. 9-10 Amend Section:

(6) If offered by an air district, an applicant may opt out of the default retrofit requirement. Applicants must sign a waiver acknowledging that due to current or future regulations they may be required to install a retrofit on the funded equipment at their own cost. Air districts have the option to not offer this additional flexibility and are encouraged to evaluate individual projects based on the near source health impacts. Large fleets subject to the Off-Road Regulation have additional requirements per section 7.(E)(4) below.

b) Off-Road Equipment Replacement, Chapter 9, Section C.7.(E)(4), pg. 9-18 Amend Section, add subsections a. and b:

1. Eligible projects for large fleets must include a particulate matter filter ~~PM trap~~ beginning January 1, 2013, for engines 75 hp and greater and January 1, 2014, for engines less than 75 hp. The retrofit waiver in section C.3.(H)(6) is no longer available to projects involving large fleets after the dates specified above.

a. Eligibility shall be determined at the time the air district commits to the proposed project. For purposes of this section, an air district's commitment to a project shall be consistent with that stated in its policies and procedures.

b. If the air district and the applicant do not have an executed contract within six months of project commitment, then the project must include a particulate matter filter in order to be eligible. Alternatively, engines which are certified to the Tier 4 final particulate matter standard or which are certified to a FEL level at or below the Tier 4 final particulate matter standard numerical level remain eligible after the dates listed in C.7.(E)(4) above.

9.8 Off-Road Equipment Replacement, Chapter 9, Section C.3.(I), page 9-10 Amend Section:

3. Replacement Equipment Requirements

****

(I) Cost-effectiveness calculations must use the hour-based formula as discussed in Appendix C. Fuel usage may only be used with case-by-case approval from ARB. If using the fuel-based formula, usage must be based on two years of historical fuel usage documentation specific for the equipment being funded. Documentation may include fuel logs, purchase receipts, or ledger entries.

(J) ~~(I)~~ Future annual hours of equipment operation for determining ~~Project~~ emission reductions must be based upon readings from an installed and fully operational hour meter. If equipment does not have a functioning hour meter at the time of the project, the hour meter must be installed, repaired and/or replaced. If during the project life the hour meter fails for any reason, the hour meter must be repaired or replaced as soon as possible at the owner's cost. ~~Alternatively, i~~If case-by-case approval was provided ~~fuel usage has been approved~~ by ARB to use fuel usage for determining emission reductions, then future annual fuel usage must be based on fuel logs, purchase receipts or ledger entries specific to the funded equipment. LSI equipment may only use the hour based calculation for determining emission reductions.

****

9.9 Off-Road Equipment Replacement, Chapter 9, Section C.3.(J)(1), page 9-10, Delete section and renumber all subsequent sections:

~~(1) For replacement with electric equipment, applicants must provide evidence of a plan to either install battery chargers for each piece of~~

~~equipment funded or install fast charging units for use with multiple pieces of equipment.~~

9.10 Off-Road Equipment Replacement, Chapter 9, Add Section C.3.(K), page 9-11 and renumber all subsequent sections:

3. Replacement Equipment Requirements

****

(K) Project load factors for calculating emission reductions and cost-effectiveness are listed in Appendix D, Table D-10. Load factors shall be selected by first choosing the equipment category (i.e. Airport GSE, Mobile Agriculture, Construction, etc.), then by selecting the equipment type within the category. This is consistent with how the equipment category and load factor inputs are selected in CARL.

****

9.11 Off-Road Equipment Replacement, Chapter 9, Section C.4.(C), page 9-11 Amend Section:

(C) The old equipment must be destroyed within 60 days of being replaced. The old equipment needs to be destroyed or rendered useless by destroying the engine block as described in Chapter 3: Program Administration, Section BB and by compromising the structural integrity of the equipment. This may be achieved by cutting the structural components of the equipment or some other manner approved by the air district. Documentation of the equipment's destruction must be provided to the air district within 10 days of destruction. Air districts which perform their own salvage inspections, must be notified within 10 days of destruction that the salvage inspection can occur.

9.12 a) Off-Road Equipment Replacement, Chapter 9, Section C.5.(C), page 9-12 Amend Section:

(C) ~~Any potential partnerships between air districts and dealers must be identified in the off-road equipment replacement plan.~~ The off-road equipment replacement plan must identify the air district's process for oversight and review of dealer identified tasks.

b) Off-Road Equipment Replacement, Chapter 9, Section C.6.(B), page 9-15 Amend Section:

(B) Equipment dealers that enter into a contract with an air district must:

****

9.13 Off-Road Equipment Replacement, Chapter 9, Section C.5.(G)(1),(2), and (3) page 9-13, Amend sections and renumber subsequent sections:

(G) Air districts are responsible for completing a pre-inspection of the old equipment, a post-inspection of the replacement equipment, and a salvage inspection of the old equipment if equipment destruction is not conducted by an air district approved salvage yard. Pre-inspections may be done by an air district approved dealer.

(1) Pre-inspection must verify the operational condition of the old equipment. The pre-inspection must verify, at a minimum, the following items:

a. Tires in usable condition (able to hold air, sufficient tread or tracks, etc.)
b. Steering wheel operational
c. Equipment able to start up and move backwards and forwards
d. Buckets, blades, rollers, etc. are working
e. Undercarriage structurally sound
f. Fuel tank in usable condition
g. No parts stripped
h. Equipment not vandalized
i. In addition, clear photographs of the old equipment must include the following views:

1. Right Side - hood down
2. Front - hood down
3. Left Side - hood down
4. Equipment serial number
~~5. Engine - left side~~
~~6. Engine - right side~~
7. Engine Serial Number - either tag or stamp on block
~~8. Equipment Identification, if available~~
9. DOORS Equipment Identification Number (EIN), if applicable
10. Rear

(2) The post-inspection must include clear photographs of the following views:

~~a. Right Side - hood down~~ Picture(s) of equipment
~~b. Front - hood down~~
~~c. Left Side - hood down~~
d. Equipment serial number
~~e. Engine - left side~~

~~f. Engine - right side~~
g. Engine Serial Number and Engine Information – tag
~~h. Equipment Identification, if available~~
~~i. DOORS EIN, if applicable~~
~~j. Rear~~
k. Diesel Emission Control Device (if available)
l. Hour meter reading

(3) Salvage inspection must include clear photographs of the destroyed engine block and cut frame rails. In addition, the following views must be taken:

a. Equipment serial number
~~b. Engine side view~~
c. Engine serial number either stamped on the block or on the tag
d. Destroyed engine block either in-frame or out of frame as specified in Chapter 3: Program Administration
e. Cut structural components
~~f. Destroyed attachments, if scrapped~~
g. Other views dependent on the method of equipment destruction

9.14 Off-Road Equipment Replacement, Chapter 9, Section C.5.(l)(4), page 9-14
Amend Section:

(4) Failure on the air district's part to follow up with such salvage inspection would constitute a finding in future ARB's ~~audit~~ Incentive Program Review of the air district's Carl Moyer Program.

9.15 Off-Road Equipment Replacement, Chapter 9, Section C.7.(B)(1), page 9-16
Amend Section:

(1) Applicants must submit information regarding fleet size and compliance status. ~~This must include the DOORS ID of the fleet, DOORS EIN of the existing (old) existing equipment, and if available, DOORS EIN of the replacement equipment.~~ All documentation submitted must be signed and dated by the applicant and include language certifying that the fleet list provided is accurate and complete. Air districts are not required to validate submitted information and will not be held liable if fleet owners falsify fleet information.

a. The following information shall be submitted at the time of application:
1. The DOORS ID of the fleet
2. The DOORS EIN if the (old) existing equipment
3. Fleet size information (total horsepower) as reported to DOORS.

4. Information to determine compliance with the Off-Road Regulation.
    i. Prior to 1/1/2014, large fleets are not required to show compliance with the Off-Road Regulation.
    ii. Prior to 1/1/2017, medium fleets are not required to show compliance with the Off-Road Regulation.
    iii. Prior to 1/1/2019, small fleets are not required to show compliance with the Off-Road Regulation.

~~a. Applicants should use the online fleet average calculator (http://arb.ca.gov/msprog/ordiesel/documents/documents.htm) to determine their fleets' compliance status and submit the information to the air district.~~

****

9.16a) Amend Section C.2.(D), page 9-4:

(D) The old equipment must be registered in the Diesel Off-road On-line Reporting System (DOORS) if it is subject to the Regulation for In-Use Off-Road Diesel-Fueled Fleets~~Vehicles~~ (Off-Road Regulation).

****

b) Amend Section C.3.(H)(4), page 9-8:

(4) If documentation can be provided to the air district and ARB that a retrofit is not technically feasible, available, or safe, then the retrofit is not required. Documentation of retrofit unavailability for mobile cargo handling equipment must follow the process set out in the Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, California Code of Regulations, title 13, section 2479 (f) (2). Documentation for a retrofit that impairs the safe operation of a vehicle must follow the process set out in the Regulation for In-Use Off-Road Diesel-Fueled Fleets~~Vehicle Regulation~~, California Code of Regulations, title 13, section 2449 (e)(8). A determination that a retrofit is not required due to safety concerns must be made prior to retrofit installation phase of a project.

c) Amend Section C.7., page 9-16:

7. Projects Subject to the Regulation for In-Use Off-Road Diesel-Fueled Fleets ~~Vehicle Regulation~~

****

(I) For more information on eligibility of off-road diesel equipment, please see the Regulation for In-Use Off-Road Diesel-Fueled Fleets~~Vehicles~~

~~Regulation~~ Carl Moyer Program Implementation Chart available at http://www.arb.ca.gov/msprog/moyer/guidelines/supplemental-docs.htm.

Chapter 10: PORTABLE AND STATIONARY AGRICULTURAL SOURCES

10.1 Portable and Stationary Agricultural Sources, Chapter 10, Sections C.1(K), page10- 4 Amend Section:

(K) Costs for necessary peripheral equipment associated with electric motor projects that may be included in the grant award amount, include~~from~~ the service pole forward (e.g., service pole with guy wire, control panel, motor leads, concrete pad, headshaft or gear head and tubing if required for diesel to motor conversion, and up to 150 feet of connecting electric line from the pole forward to the motor). ~~may be included in the grant award amount.~~

10.2 Portable and Stationary Agricultural Sources, Chapter 10, Section C.1(L), page 10-5 Amend Section:

(L) Variable frequency devices (VFD) may be eligible for funding provided~~:~~ the air district must report VFD cost and serial number information in CARL.

~~(1) The air district provides notification to ARB liaison with correspondence to be placed in the air district project file.~~

~~(2) The air district reports VFD cost and serial number information in CARL.~~

~~(3) The VFD costs less than 50 percent of the new motor cost. A VFD cost that is 50 percent or greater than the new motor cost requires a case-by-case approval from ARB.~~

10.3 Portable and Stationary Agricultural Sources, Chapter 10, Section C.1.(P), page 10-5 Amend Section:

(P) In electric motor projects, the applicant must have documentation of application or payment to the local utility company for power installation. This documentation requirement applies to new motor and repower installations.

10.4 Portable and Stationary Agricultural Sources, Chapter 10, Section C.2.(B), page 10-6 Amend Section:

(B) New engine/motor repower projects in which the horsepower of the new engine/motor is an increase to 150 percent or larger from the baseline (existing) engine ~~requires a case-by-case approval from ARB.~~ may be funded at an air district's discretion if the applicant pays for the additional cost associated with the larger engine/motor. The eligible grant funding will be based on the smaller sized engine/motor. The emission reduction calculations shall be based upon the funded (higher horsepower) engine/motor. Air districts that choose to fund horsepower engine/motor must document in the project file the equipment cost of the funded (higher horsepower) engine/motor as well as the method used to determine the project grant amount (e.g. dealership cost estimate of the lower horsepower engine/motor.)

10.5 Portable and Stationary Agricultural Sources, Chapter 10, Section C.2.(C), page10-6 Amend Section:

(C) A repower project in which the total number of existing engines is different than the total number of replacement engines/motors requires a non-calculation project entry into CARL. If the total sum of the new engine(s)/motor(s) horsepower is greater than 125 percent of the sum of the existing engine(s)/motor(s) total horsepower then the load factor must be adjusted. ~~case-by-case approval from ARB.~~

10.6 Portable and Stationary Agricultural Sources, Chapter 10, Section C.2.(F), page 10-6 Delete Section and renumber subsequent sections:

~~(F) Genset engines are not eligible for repowers.~~

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10.7 Portable and Stationary Agricultural Sources, Chapter 10, Section C.7.(B), page10-9 Amend Section:

(B) Diesel engines regulated under the Portable Engine ATCM must be registered (or permitted) in an air district to be eligible for repower projects or documentation must be included in the project file from the air district stating that a registration (or permit) is not required to operate in their air district. ~~If portable diesel engines are required by the air district to be registered or permitted then these engines must have registration or permits to be eligible for engine repowers.~~

Attachment II
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Chapter 11: LOCOMOTIVES

11.1 Locomotives, Chapter 11, Section A, page 11-1; Section B, Table 11-2, page 11-2; Section D.2, pages 11-2 to 11-6 Amend Sections:

a) Amend Section A, page 11-1:

A. Projects Eligible for Funding

****

Project Types: Five types of locomotive projects are eligible for Carl Moyer Program funding:

~~1.~~ Locomotive replacement ~~Alternative technology switcher~~ ~~(or other cleaner-than-required new locomotive)~~
2. Idle limiting device (ILD)
3. U.S. EPA certified engine remanufacture kit or repower/refurbishment
4. ARB verified retrofit
5. Head end power unit (HEP)

****

b) Amend Section B, Table 11-2:

Table 11-2

Maximum Grant Amount for Carl Moyer Program Locomotive Projects

Railroad Class/Type	Locomotive Replacement ~~Alternative Technology Switcher~~	Idle Limiting Device (ILD)	Refurbishment or Certified Remanufacture Kit
Class 1	50 percent	not eligible	50 percent
Class 3, Passenger, Military, and Industrial	85 percent	50 percent (passenger locomotives on case-by-case basis)	Tier 0+: 75 percent* Tier 1+: 80 percent* Tier 2+: 85 percent*

** "+" is used to refer to the new U.S. EPA locomotive engine remanufacture standards (U.S. EPA, 2008)*

****

c) Amend Section D.2, pages 11-2 to 11-6 Amend Sections:

2. Locomotive ~~Alternative Technology Switcher~~ Replacement

~~Alternative switcher~~ Locomotives Replacements are funded by the Carl Moyer Program and include Tier 4 locomotives (or cleaner), genset locomotives (multi-engine switcher) and electric-hybrid locomotives. Multi-engine switchers are typically powered by two or three off-road engines, while electric-hybrids use a small diesel engine to charge batteries that provide locomotive power. ~~These locomotives typically include an existing locomotive frame significantly refurbished with a new engine or engines, batteries, electronics, controls, and other equipment. The replacement engines have a much lower horsepower rating and emissions than the typical switch locomotive engine.~~ United States Environmental Protection Agency (U.S. EPA) considers a~~n~~ refurbished locomotive ~~alternative technology switcher~~ a new locomotive if it includes at least 75 percent (by value) new parts.

(A) The locomotive replacement ~~alternative technology switcher~~ must achieve a NOx emission rate of 3.5 g/bhp-hr and a PM emission rate of 0.10 g/bhp-hr.

****

(C) Baseline emissions for a~~n~~ locomotive replacement ~~alternative technology switcher~~ project reflect Tier 0 emission rates for Class 1 and intercity passenger and commuter locomotives and uncontrolled emission rates for Class 3 locomotives and small passenger locomotives related to tourism, unless the locomotive to be replaced is currently certified, or is required by the U.S. EPA at time of next rebuild to be certified, to a more stringent tier. In this situation, the baseline emissions for calculation purposes must reflect the current, or required, tier.

****

(G) Project life:

(1) Class 1 locomotive replacement ~~alternative technology switcher~~ projects in air districts other than the South Coast must have a minimum project life of 10 years. ARB may approve a project life of less than 10 years for these locomotives on a case-by-case basis. Projects with shorter lives may be subject to additional funding restrictions, such as a lower cost-effectiveness limit or a project cost cap.

****

11.2 Locomotives, Chapter 11, Section D.2 (B) (1), page 11-5 Amend Section:

(1) U.S. EPA certified emission rates for the project locomotive are found at www.usepa.gov/otaq/certdata.htm. On the U.S. EPA spreadsheets, "L/H" refers to a line haul locomotive, "SW" refers to a switcher, and "THC" refers to total hydrocarbons. The U.S. EPA emission factors must be adjusted as follows (see Table 11-5): THC must be converted to ROG by multiplying by 1.053, and NOx and PM must be multiplied by 0.94 and 0.86, respectively, to account for the use of ultra low sulfur diesel. If this emission factor data is not made available by EPA for a locomotive which has been certified by EPA based on off-road engine certifications, districts must ask ARB to provide or approve appropriate locomotive emission factors.

****

11.3 Locomotives, Chapter 11, Section D.1 (J), page 11-4, Section D.2 (A) (1), page 11.5, and Section D.4, page 11-7 Amend Sections:

a) Amend Section D.1(J), page 11-4:

1. General Locomotive Project Criteria

****

(J) Locomotives must be both certified by EPA and verified by ARB in order to be eligible for funding.

****

b) Amend Section D.2 (A) (1), page 11-5:

(1) New locomotives with an aggregate engine power rating greater than or equal to 1,006 horsepower (750 kW) must be certified by U.S. EPA and verified by ARB to achieve this emission level (or cleaner).

****

c) Amend Section D.4, page 11-7:

4. U.S. EPA-Certified and ARB-verified Engine Remanufacture Kit or Locomotive Refurbishment

Engine remanufacture kits typically include new fuel injectors, cylinder head assemblies, pistons, and other engine components. Engine remanufacture kits must be certified by U.S. EPA, verified by ARB, and meet all of the following criteria to be eligible for Carl Moyer Program funding. Locomotive refurbishments (or repowers) are also eligible for funding, provided the engine is certified and verified.

(A) Purchase and installation of the cleanest available tier U.S. EPA-certified and ARB verified remanufacture kit or refurbishment (engine repower) is eligible for Carl Moyer Program funding. Applicants must provide evidence that the kit for which funding is requested is the cleanest available kit certified for use on the project locomotive.

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Chapter 12: MARINE VESSELS

12.1 Marine Vessels, Chapter 12, Table 12-1, page 12-1; Table 12-2, page 12-3 Amend Tables.

A. Projects Eligible for Funding

****

Attachment II
Strikeout/Underline Language of Changes to 2011 Carl Moyer Program Guidelines

Table 12-1
Summary of Funding Opportunities

Project Type	Subject to ARB Rule	Moyer Funding Opportunities[1]
Vessels subject to Commercial Harbor Craft Regulation Schedules for Meeting Tier 2 or Tier 3 Standards (ex: ~~B~~barge, crew & supply, dredge, excursion, ferry, towboat, tugboat~~,~~) - engine repower, remanufacture, retrofit or new purchase	Commercial Harbor Craft Regulation[2]	Limited opportunity
Vessels ***not*** subject to Commercial Harbor Craft Regulation Schedules for Meeting Tier 2 or Tier 3 Standards (ex: ~~F~~fishing vessel or pilot/work boat) - engine repower, remanufacture, retrofit or new purchase	No	Not limited by regulation
Shore power - shore-side	Shore Power Regulation[3]	Very limited opportunity
Shore power - vessel retrofit	Shore Power Regulation[3]	Limited opportunity

[1] Limited opportunities means a fleet's compliance status with the ARB regulation must be determined. Contact air district Moyer Program staff or consult CHC regulation Carl Moyer Implementation Charts at: http://www.arb.ca.gov/msprog/moyer/guidelines/supplemental-docs.htm in addition to these guidelines.
[2] Harbor Craft Regulation: http://www.arb.ca.gov/ports/marinevess/harborcraft.htm
[3] Shore Power Regulation: http://www.arb.ca.gov/ports/shorepower/shorepower.htm

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B. Maximum Eligible Funding Amounts

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Table 12-2
Maximum Project Costs Eligible for Carl Moyer Program Funding

Project Type		Maximum
Vessels subject to Commercial Harbor Craft Regulation Schedules for Meeting Tier 2 or Tier 3 Standards (ex: barge, crew & supply, dredge, excursion, ferry, towboat, tugboat)	Engine repower or remanufacture kit	50 percent
Vessels ***not*** subject to Commercial Harbor Craft Regulation Schedules for Meeting Tier 2 or Tier 3 Standards (ex: ~~F~~fishing, pilot, work boat)~~, other vessels not subject to Harbor Craft Regulation in-use compliance requirements.~~	Engine repower or remanufacture kit compliant to EPA marine Tier 2 emission level	80 percent
	Compliant to EPA marine Tier 3 emission level	85 percent
Any vessel propulsion engine repower with an off-road Tier 2 or cleaner certified engine		Case-by-Case Basis
ARB Verified Marine Retrofit Device		Case-by-Case Basis
New Vessel Purchase		Case-by-Case Basis
Shore power – shore-side		50 percent of transformer & other equipment between the vessel and transformer
Shore power – ship-side		100 percent of retrofit cost; 50 percent of transformer cost

****

12.2 Marine Vessels, Chapter 12, Section C.2.(A), page 12-5 Amend Section:

C.2. Repower

(A) All new engines and replacement engines purchased for Carl Moyer Program marine vessel repower projects must meet the requirements of the Commercial Harbor Craft Regulation set forth under California Code of Regulations, title 17, sections 93118.5(e). The regulation includes requirements for newly acquired engines and requirements for replacement engines in vessels subject to the schedules to meet Tier 2

and Tier 3 standards. ~~be certified to meet U.S. EPA Tier 2 marine emission standards or cleaner (e.g., Tier 3 or higher).~~ Use of an off-road certified engine must adhere to the requirements set forth under California Code of Regulations, title 17, sections 93118.5(e)(3) and (e)(4), especially the marinization requirements set forth in Code of Federal Regulations, title 40, part 1042.605. Project proposals for repower of propulsion engines with off-road engines will be considered on a case-by-case basis.

~~(1) Project proposals for repower of propulsion engines will be considered on a case-by-case basis.~~

~~(2) Tier 2 engines that are less than or equal to 100 horsepower and are installed after January 1, 2009 are only eligible for Carl Moyer Program funds if it can be demonstrated that a Tier 3 engine is unavailable or technically infeasible.~~

12.3 Marine Vessels, Chapter 12, Section C.2.(D)(3), page 12-6 Amend Section:

(3) Costs related to the purchase and/or installation of a new transmission may be eligible when it is a necessary part of the engine repower; and an ineligible expense when it is required for maintenance or repair purposes. Ordinarily, a statement from the vendor or applicant that the new reduced emissions engine is not compatible with the existing baseline transmission is sufficient justification for eligibility; please retain a copy of the vendor or applicant's statement(s) or other documentation in the project file. ~~on a case-by-case basis. Districts should provide the following for all requests:~~

~~a. Documentation from engine dealer/installer justifying the necessity of a new transmission.~~

b. ~~Notification to ARB liaison with correspondence to be placed in air district project file.~~

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Strikeout/Underline Language of Changes to 2011 Carl Moyer Program Guidelines

Chapter 13: LIGHT-DUTY VEHICLES

13.1 Light-Duty Vehicles, Chapter 13, Section C. pages 13-2 and 13-3 Amend Section:

C. Regulatory Background

Light-duty vehicle retirement projects are subject to the requirements of the Voluntary Accelerated Vehicle Retirement Regulation (VAVR Regulation), Cal. Code Regs., tit. 13, §§ 2601 et seq. Air districts may choose to act as the enterprise operator in lieu of contracting out this work to a third party. However, costs incurred by the District to perform the duties of the enterprise operator shall be considered administrative costs.

Light and medium-duty vehicle projects funded through AB923 are authorized by Health and Safety code Section 44229 which states in subsection (b)(4) that these projects must be in compliance with guidelines adopted by ARB. This chapter constitutes ARB's adopted guidelines for light-duty projects.

13.2 Light-Duty Vehicles, Chapter 13, Section M., page 13-9 Amend Section:

L. Emission Benefits

Emission reductions from conventional VAVR projects are calculated using the VAVR Regulation methodology. They are equal to the retired vehicle's emission rates minus those of the replacement vehicle with the difference multiplied by the average vehicle miles traveled by light duty vehicles in the year of vehicle retirement and by the three year project life. The retired vehicle's emission rates are equal to those for gasoline-powered, light-duty vehicles for the model year of the retired vehicle in the year of vehicle retirement. Replacement vehicle emissions are the fleet average emissions for all gasoline-powered light-duty vehicles for model years 1990 through the year of vehicle retirement. Emission rates and average vehicle miles traveled are generated by ARB's motor vehicle emissions model. NOx, ROG, CO, and PM emission reductions over the three year project life by vehicle model year are located in Tables 13-4 and 13-5 below. These tables will be updated on an as needed basis through a mail-out to reflect revisions to the motor vehicle emissions model and/or to include additional years.

****

13.3 Light-Duty Vehicles, Chapter 13, Section M. Emission Benefits, page 13-12

Add Tables 13-4, 13-5 and 13-7, renumber Table 3-4 to 13-6:

M. Emission Benefits

Add Tables:

****

Table 13-4					
Retired Vehicle Emission Reductions, CY 2014 (lbs/3 yr)					
MY	ROG			NOx Exhaust	PM10 Exhaust
	Exhaust	Evap	Total		
pre 1971	256.7	177.0	433.7	188.9	2.57
1971	258.4	175.1	433.5	192.3	2.64
1972	259.6	173.9	433.4	195.1	2.70
1973	262.9	173.9	436.8	198.2	2.75
1974	258.7	129.1	387.9	195.6	2.81
1975	212.8	118.3	331.0	193.2	3.09
1976	199.9	106.4	306.3	217.0	3.13
1977	209.6	83.2	292.8	229.4	3.08
1978	106.5	83.3	189.8	131.6	3.17
1979	102.1	81.7	183.8	127.1	3.17
1980	101.7	64.8	166.5	130.0	3.08
1981	90.2	60.7	150.9	104.1	1.22
1982	82.0	55.0	137.0	102.5	1.23
1983	69.0	52.8	121.8	103.0	1.20
1984	64.5	45.5	110.0	111.5	1.23
1985	57.0	42.2	99.2	108.8	1.24
1986	53.0	37.8	90.8	108.7	1.27
1987	48.9	43.7	92.5	103.6	1.29
1988	36.5	57.3	93.8	92.3	1.33
1989	38.7	58.1	96.9	79.6	1.33
1990	39.2	71.5	110.7	69.3	1.33
1991	39.9	55.0	95.0	83.6	0.70
1992	41.0	54.1	95.0	87.4	0.71
1993	35.6	52.6	88.1	82.7	0.73
1994	28.9	50.4	79.3	74.4	0.74
1995	23.2	42.7	66.0	57.0	0.74
1996	18.1	33.2	51.4	39.7	0.14
1997	17.2	24.7	41.9	37.9	0.16
1998	12.7	7.8	20.5	30.4	0.16
1999	9.5	6.6	16.1	27.0	0.16
2000	5.3	5.4	10.6	19.5	0.16
2001	4.2	4.1	8.3	17.4	0.16
2002	3.9	2.9	6.8	17.0	0.17
Source: EMFAC2011LDV					

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Table 13-5					
Retired Vehicle Emission Reductions, CY 2015 (lbs/3 yr)					
MY	ROG			NOx Exhaust	PM10 Exhaust
	Exhaust	Evap	Total		
pre 1972	253.9	175.2	429.2	189.2	2.59
1972	255.3	173.9	429.2	192.1	2.65
1973	258.4	174.4	432.8	195.0	2.70
1974	255.6	130.1	385.7	193.9	2.76
1975	207.6	119.6	327.2	192.2	3.03
1976	191.4	107.4	298.8	209.2	3.08
1977	201.8	83.8	285.6	221.1	3.03
1978	103.9	83.9	187.9	128.5	3.12
1979	99.7	82.3	182.0	124.3	3.12
1980	98.4	65.7	164.1	126.7	3.04
1981	87.5	61.5	149.0	101.8	1.20
1982	80.0	55.5	135.4	100.8	1.21
1983	68.1	52.9	121.0	102.0	1.18
1984	63.8	45.4	109.2	110.7	1.21
1985	56.2	42.4	98.6	108.0	1.22
1986	52.5	37.7	90.2	107.9	1.25
1987	48.7	42.2	90.9	103.9	1.27
1988	36.7	57.5	94.1	93.3	1.32
1989	38.9	60.9	99.8	80.7	1.32
1990	39.4	77.2	116.6	70.7	1.32
1991	40.1	58.8	98.9	85.5	0.69
1992	41.1	58.3	99.4	89.6	0.71
1993	36.0	57.1	93.1	85.4	0.72
1994	30.0	55.1	85.1	78.3	0.74
1995	24.2	47.1	71.4	60.4	0.73
1996	18.9	36.7	55.6	41.8	0.14
1997	17.9	27.5	45.4	40.0	0.16
1998	13.6	9.3	22.9	32.4	0.16
1999	10.5	8.1	18.7	29.1	0.16
2000	6.2	6.9	13.0	21.5	0.16
2001	5.1	5.7	10.7	19.3	0.17
2002	4.7	4.4	9.2	18.8	0.17
2003	3.9	2.9	6.8	18.4	0.17
Source: EMFAC2011LDV					

1. Emission reductions for diesel-powered vehicles were estimated using a similar methodology. Because of very limited data and only minor differences in emission rates from one year to another, average emission reductions were only estimated for two model year ranges for all four calendar years. Replacement vehicle emission rates were the same as those used for gasoline-powered vehicles. Average NOx, ROG, CO, and PM emission reductions over the 3 year project life by model year range are located in Table 13-6 and updated average emission reductions are located in Table 13.7. There are no evaporative emission reductions for retiring a diesel-powered vehicle.

Renumber Table from 13-4 to 13-6:

Table ~~13-4~~ 13-6

Retired Diesel-Powered Vehicle Emission Reductions*

Model Year Range	Pollutant	lb/3 yr CY 2010-2013
Pre 1984	ROG	5.764
	NOx	22.926
	PM	3.733
1984-1992	ROG	5.092
	NOx	40.051
	PM	5.166

*Source: EMFAC2007 V2.3 Nov 1 2006

Add Table 13-7:

Table 13-7
Retired Diesel-Powered Vehicle Emission Reductions*

Model Year Range	Pollutant	lb/3 yr CY 2012~~0~~-2015~~3~~
Pre 1984	ROG	5.8
	NOx	88.0
	PM	7.2
1984-1992	ROG	13.6
	NOx	281.2
	PM	9.6

*Source: EMFAC2011LDV

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Chapter 14: LAWN AND GARDEN EQUIPMENT REPLACEMENT

14.1 Lawn and Garden Replacement, Chapter 14, Section D, Amend Table 14-1, page 14-10

Table 14-1
Gasoline Lawn Mower Emission Reductions (lbs/~~10~~yr)

Model Year	ROG			NOx	PM10
	Exhaust	Evap	Total	Exhaust	Exhaust
2010	0.290	0.847	1.137	0.071	0.048

OFF-ROAD VOUCHER INCENTIVE PROGRAM (ORVIP)

ORVIP.1. Section B, page 2, Amend Section:

B. Project Funding Amounts

The maximum total project funding amounts associated with reducing the eligible costs of an ORVIP project are pre-determined and shown in Appendix O. If there is a discrepancy between the engine horsepower of the existing and replacement equipment, then the lower horsepower should be used to determine the voucher funding amount.

ORVIP.2. Section C.1.(E), page 3, Amend Section:

C.1. General Program Criteria

****

E) Obtaining Financing: The participant may obtain public and/or private financing to assist in the purchase of replacement equipment, but cannot seek additional public funded grants~~.~~, except as allowed in C.2(A)(6).

****

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ORVIP.3.a) Section C.2.(A)(9), page 5, Amend Section:

1. **Participant Requirements**

****

(9) Voucher Redemption Deadline: The dealer and owner must agree on a date in which the replacement equipment will be delivered. The voucher will be redeemable within thirty (30) calendar days of issuance or by the delivery date agreed upon by the dealer and owner, whichever is later. If the owner is unable to purchase the replacement equipment after a voucher has been issued, the owner must notify the dealer and the air district immediately so that funds can be reallocated.

b) Appendix D4., page 36, Amend Section:

4. Owner Obligation: The Owner must comply with the following requirements in accordance with the Guidelines, and submit certification to the Air District verifying that the requirements have been met. Within sixty (60) calendar days of receiving equipment under this Agreement, Owner will:

****

ORVIP.4. Section C.4.(C)(1), page 8, Amend Section:

4. Replacement Equipment Requirements

****

(1)Engines participating in the averaging, banking, and trading program that are certified to family emission limits (FEL) higher than the Tier 4 ~~applicable~~ emission standards, as designated on the ARB Executive Order, are ~~in~~eligible to participate in the CMP. The funding levels associated with Tier 3 must be used when determining allowable funding for these engines.

****

ORVIP.5. Section C.4.(C)(2), page 8, Amend Section and renumber subsequent sections:

4. Replacement Equipment Requirements

****

(2)Engines participating in the averaging, banking, and trading program that are certified to family emission limits (FEL) below the applicable emission standards are eligible to participate in the ORVIP. The funding levels associated with the applicable interim Tier 4 (interim Tier 4, Tier 4 Phase-Out, Tier 4 Phase-

in/Alternate NOx) or Tier 4 Final emission standards, per the Executive Order, must be used when determining allowable funding for these engines.

****

ORVIP.6. Section C.4.(C)(4), page 9, Delete section and renumber all subsequent sections:

4)~~The engine in the replacement equipment must be certified to a NOx emission standard that is at least 15 percent lower than the emission standard(s) applicable to the existing engine and be certified to either the current applicable emission standard, except as noted below, or to a FEL NOx or Oxides of Nitrogen plus Non-Methane Hydrocarbon (NOx+NMHC) level that is lower than the required emission standard.~~

ORVIP.7. Section C.4.(C)(5), page 9, Amend Section:

(5)Equipment manufactured under the "Flexibility Provisions for Equipment Manufacturers", as described in California Code of Regulations, title 13, section 2423(d), are ~~in~~eligible for CMP funding as replacement equipment~~.~~,provided the engine is certified at or below the Tier 3 emission standards. Eligible equipment produced under the "Flexibility Provisions for Equipment Manufacturers" whose engine family is certified to a FEL are also subject to the provisions of section C.4.(C)(1). Equipment manufactured under the flexibility provisions with an engine whose engine family meets a standard, Tier or FEL less stringent than Tier 3 are ineligible for funding.

ORVIP.8.a) Section C.5.(Q), page 11, Amend Section:

(Q) Air districts must approve or reject applications within ~~five~~ fifteen (15) business days of receipt.

b) Section C.5.(V), page 13, Amend Section:

(V) Rejected Projects: Air districts must mail or email an application rejection letter and the application package to the applicant if their application has been rejected. This letter must be issued by the end of the ~~five-day~~ fifteen (15) business day review period. The air district must state the reason(s) for the rejection on the rejection letter. The air district must also notify the dealer by mailing or emailing a copy of the rejection letter. A template of the rejection letter is in Appendix K.

c) Section C.5.(BB), page 14, Amend Section:

(BB) Air districts must enter all project data information into the CARL database within five (5) business days of approving an application for a voucher. Payment

information should be submitted within ~~five~~ fifteen (15) business days after payment is issued.

ORVIP.9. Section C.5.(FF), page 14, Amend Section:

(FF) Audit and Monitoring: Air districts must allow ARB to monitor their voucher program, which includes ~~audits~~ Incentive Program Review of the air district's implementation of the program. Most ARB ORVIP ~~audits~~ reviews will occur during a regular CMP ~~audit~~ Incentive Program Review, however ARB may request project information on an as needed basis.

ORVIP.10. Section C.6.(A)(9), page 17, Amend Section:

(9) Ensure the existing equipment ~~and its original, signed title~~ is sent to a participating dismantler yard for destruction within ~~thirty~~ sixty (~~3~~60) calendar days of owner delivery to the dealership. Immediately notify the air district of the location and date of delivery of the existing equipment to the dismantler.

ORVIP.11. Section D, page 22, Amend Section D flow chart:

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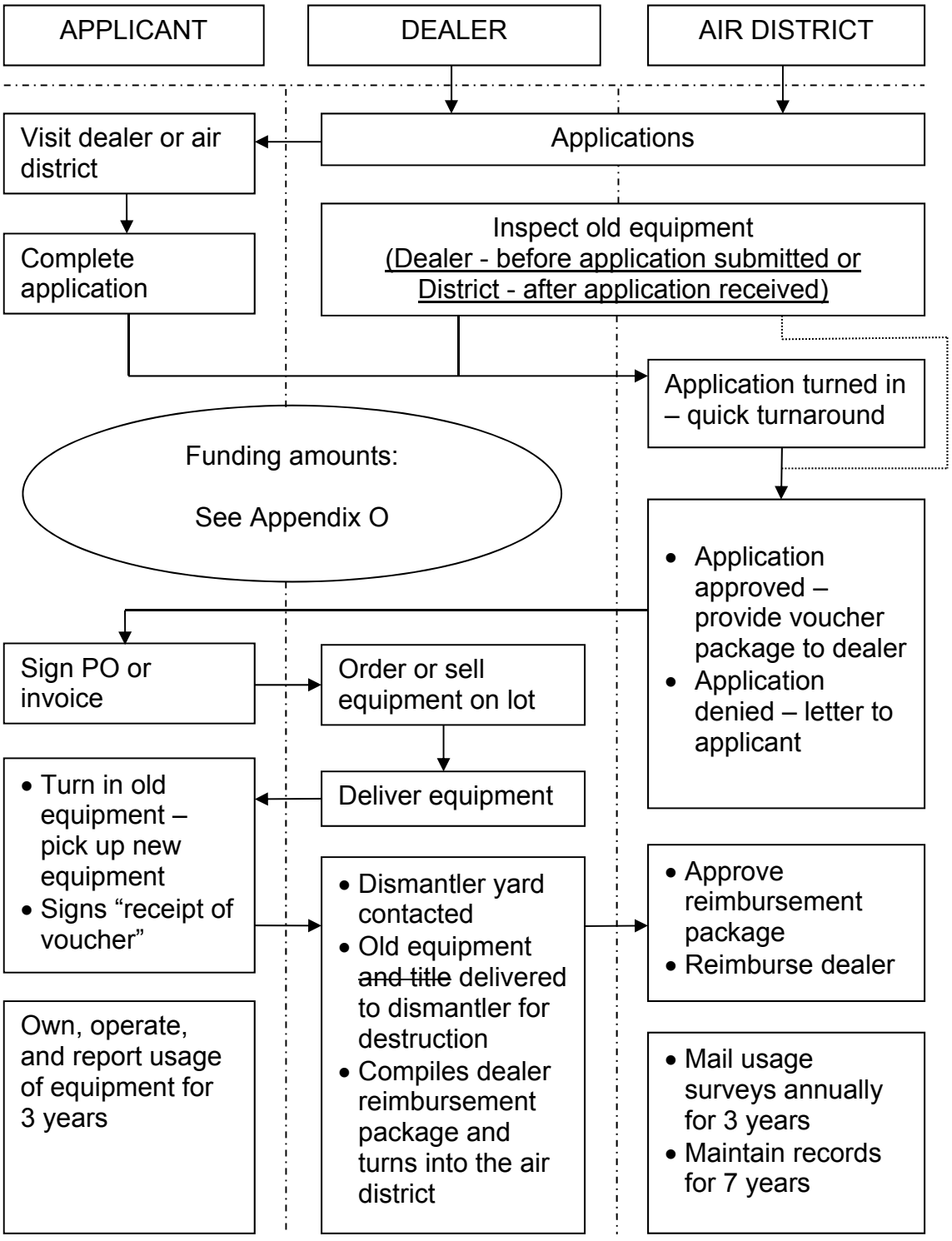

ORVIP.12. a) Section C.1.(A)(2), page 3, Amend Section:

(2) Construction tractors/loaders/backhoes in small fleets that have a total fleet hp of 2,500 or less, as determined by the In-Use Off-Road Diesel-Fueled Fleets ~~Vehicles~~ Regulation, California Code of Regulations, title 13, section 2449, et seq. (Off-Road Regulation).

b) Section D, page 21, Amend Section D:

D. Definitions

****

Small Fleets: As defined in the In-Use Off-Road Diesel-Fueled Fleets ~~Vehicles~~ Regulation (California Code of Regulations, title 13, § 2449(c)(25)(C)): "Small Fleet" means a fleet with total maximum power of less than or equal to 2,500 hp that is owned by a business, non-profit organization, or local municipality, or a local municipality fleet in a low population county irrespective of total maximum power, or a non-profit training center irrespective of total maximum power, or a captive attainment area fleet irrespective of total maximum hp.

****

c) Appendix A, page 23, Amend Appendix A:

(Appendix A, Off-Road Voucher Incentive Program Application Package)

****

Eligibility Criteria

To be eligible for funding in the Off-Road Voucher Incentive Program, projects must meet the criteria described in the Off-Road Voucher Incentive Program (ORVIP) Guidelines. These criteria include, but are not limited to, the following:

- Eligible Equipment: Uncontrolled off-road compression ignition equipment with engines that are greater than or equal to than 25 horsepower (hp) and less than 175 hp that meet the following criteria are eligible to participate in the ORVIP:
  - Agricultural tractors that are not currently regulated by an Air Resources Board (ARB) in-use regulation.
  - Construction tractors/loaders/backhoes in small fleets that have a total fleet hp of 2500 or less, as determined by the In-Use Off-Road Diesel-Fueled Fleets ~~Vehicles~~ Regulation (Off-Road Regulation).

o Construction tractors/loaders/backhoes in medium fleets as determined by the In-Use Off-Road Diesel-Fueled Fleets ~~Vehicles~~ Regulation (Off-Road Regulation) until December 31, 2013.

****

ORVIP.13. Section D, page 21, Amend Section:

D. Definitions

****

Uncontrolled Engine: An off-road diesel engine that is manufactured in the following years and is not certified to any ARB off-road diesel emission standards or any U.S. EPA non-road diesel emission standards, and that has not been retrofitted with a VDECS:

- Pre-199~~8~~9 (25 to 49 hp)
- Pre-199~~7~~8 (50 to 99 hp)
- Pre-199~~6~~7 (100 to 174 hp)

****

ORVIP.14. Appendix B Sections 7- 9, page 32 Amend Various Sections:

4. DEALER TRAINING
The air district~~'s method for working with ARB and setting up~~ provides training for the participating dealers on the ORVIP. If the air district chooses to have dealers do the inspections, the air district must specify the media in which the inspection photographs will be submitted to the air district. The air district must work with ARB in coordinating training and materials.

5. DISMANTLER TRAINING
The air district~~'s method for working with ARB and setting up~~ provides training for the participating dismantlers on the ORVIP.

6. OUTREACH
The air district~~'s plan on outreach and their method of collaborating with ARB~~ establishes ~~i~~an ~~the~~ outreach goal for the ORVIP.

ORVIP.15. Appendix I, page 48, Table I Required Photographs, Amend Table:
(Amend Required Photographs Portion:)

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Required Photographs

- Digital photos should be clear images with a minimum of 640x480 capture resolution. The Air District will specify the digital media required to save the pictures on.
- If applicable to the equipment, the DOORS EIN is not required to be photographed at the post inspection, but the EIN will need to be obtained by the post inspection.

(check the boxes/circles of pictures taken)

Pre-inspection of existing equipment	Post inspection of replacement equipment
❑ Equipment from left side ❑ Equipment from right side ❑ Equipment from front ❑ Equipment from back ❑ DOORS EIN (if applicable) ❑ Equipment serial number ~~❑ Engine from drivers side~~ ❑ Engine tag (if available)* o Engine make o Engine model o Engine serial number o Engine family number	~~❑ Equipment from left side~~ ~~❑ Equipment from right side~~ ~~❑ Equipment from front~~ ~~❑ Equipment from back~~ ❑ Picture(s) of equipment ~~❑ DOORS EIN (if applicable)~~ ❑ Equipment serial number ~~❑ Engine from drivers side~~ ❑ Engine tag o Engine make o Engine model o Engine serial number o Engine family number
Pre-Dismantler inspection of existing equipment	**Dismantler inspection of existing equipment**
❑ Equipment from left side ❑ Equipment from right side ❑ Equipment from front ❑ Equipment from back ~~❑ DOORS EIN (if applicable)~~ ❑ Equipment serial number ~~❑ Engine from drivers side~~ ❑ Engine tag (if available)* o Engine make o Engine model o Engine serial number o Engine family number	~~❑ Equipment from left side~~ ~~❑ Equipment from right side~~ ~~❑ Equipment from front~~ ~~❑ Equipment from back~~ ❑ Picture(s) of equipment ~~❑ DOORS EIN (if applicable)~~ ❑ Equipment serial number ~~❑ Engine from drivers side~~ ❑ Engine tag (if available)* o Engine make o Engine model o Engine serial number o Engine family number ❑ Cut in frame rails ❑ Hole in engine block (at least 3 inches wide)

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ORVIP.16. Appendix N, page 53, Usage Survey Table, Amend Table:

****

Using the map at right, estimate the percentage of your ~~annual mileage or fuel~~ usage that occurred in each area.	
North Coast:	Northeast Plateau:
Lake County:	Sacramento Valley:
San Francisco Bay:	Mountain Counties:
North Central Coast:	Lake Tahoe:
South Central Coast:	San Joaquin Valley:
South Coast:	Great Basin Valleys:
San Diego County:	Mojave Desert:
Outside California:	Salton Sea:
Note: The total of all percentages must equal 100.	

****

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ORVIP.17. Appendix O, page 54 and 56 VIP Replacement Funding Matrix – Construction Tractor/Loader /Backhoe Table and VIP Replacement Funding Matrix – Agricultural Tractor Table Amend Tables:

(Amend Table)

****

VIP Replacement Funding Matrix – Construction Tractor/Loader/Backhoe								
	125-149 Horsepower				**150-174 Horsepower**			
Minimum Annual Usage (Hours)	Tier 3	Tier 4 Phase Out	Tier 4 Phase-In or Alternate NOx	Tier 4 Final	Tier 3	Tier 4 Phase Out	Tier 4 Phase-In or Alternate NOx	Tier 4 Final
400								$11,000
500		$10,000	$10,000	$11,500		$12,000	$12,000	$14,000
600		$12,000	$12,000	$14,000	$11,500	$14,000	$14,500	$17,000
700	$11,000	$14,000	$14,000	$16,500	$13,500	$16,500	$17,000	$19,500
800	$13,000	$16,000	$16,000	$19,000	$15,500	$19,000	$19,500	$22,500
900	$14,500	$18,000	$18,000	$21,000	$17,500	$21,500	$22,000	$25,500
1000	$16,000	$20,000	$20,000	$23,500	$19,500	$24,000	$24,500	$28,500
1100	$17,500	$22,000	$22,000	$26,000	$21,500	$26,000	$26,500	$31,000
1200	$19,500	$24,000	$24,500	$28,500	$23,500	$28,500	$29,000	$34,000
1300	$21,000	$26,000	$26,500	$30,500	$25,000	$31,000	$31,500	$37,000
1400	$22,500	$28,000	$28,500	$33,000	$27,000	$33,500	$34,000	$39,500
1500	$24,000	$30,000	$30,500	$35,500	$29,000	$36,000	$36,500	$42,500
1600	$26,000	$32,000	$32,500	$38,000	$31,000	$38,000	$39,000	$45,500
1700	$27,500	$34,000	$34,500	$40,000	$33,000	$40,500	$41,500	$48,000
1800	$29,000	$36,000	$36,500	$42,500	$35,000	~~$43,500~~ $43,000	$44,000	$51,000
1900	$31,000	$38,000	$38,500	$45,000	$37,000	$45,500	$46,500	$54,000
2000	$32,500	$40,000	$40,500	$47,500	$39,000	$48,000	$49,000	$57,000
2100	$34,000	$42,000	$42,500	$49,500	$41,000	$50,000	$51,000	$59,500
2200	$35,500	$44,000	$44,500	$50,000	$43,000	$52,500	$53,500	$60,000
2300	$37,500	$46,500	~~$46,500~~ $46,000	$50,000	$45,000	$55,000	$56,000	$60,000
2400	$39,000	$48,000	$49,000	$50,000	$47,000	$57,500	$58,500	$60,000
2500	$40,500	$50,000	$50,000	$50,000	$48,500	$60,000	$60,000	$60,000
2600	$42,000	$50,000	$50,000	$50,000	$50,500	$60,000	$60,000	$60,000
2700	$44,000	$50,000	$50,000	$50,000	$52,500	$60,000	$60,000	$60,000
2800	$45,500	$50,000	$50,000	$50,000	$54,500	$60,000	$60,000	$60,000
2900	$47,000	$50,000	$50,000	$50,000	$56,500	$60,000	$60,000	$60,000
3000	$48,500	$50,000	$50,000	$50,000	$58,500	$60,000	$60,000	$60,000
3100+	$50,000	$50,000	$50,000	$50,000	$60,000	$60,000	$60,000	$60,000

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(Amend Table)

****

VIP Replacement Funding Matrix – Agricultural Tractor								
	75-99 Horsepower				**100-124 Horsepower**			
Minimum Annual Usage (Hours)	Tier 3	Tier 4 Phase Out	Tier 4 Phase-In or Alternate NOx	Tier 4 Final	Tier 3	Tier 4 Phase Out	Tier 4 Phase-In or Alternate NOx	Tier 4 Final
200	$5,000	$6,500	$6,500	$7,500		$8,500	$9,000	$10,000
300	$7,500	$9,500	$10,000	$11,000	~~$10,000~~ $11,500	$13,000	$13,500	$15,000
400	$10,000	$13,000	$13,500	$15,000	~~$13,000~~ $15,500	$17,500	$18,000	$20,000
500	$12,500	$16,000	$16,500	$18,500	~~$16,500~~ $19,500	$22,000	$22,500	$25,000
600	$15,000	$19,500	$20,000	$22,500	~~$20,000~~ $23,000	$26,500	$27,000	$30,000
700	$17,500	$22,500	$22,500	$22,500	~~$23,500~~ $27,000	$30,000	$30,000	$30,000
800	$20,000	$22,500	$22,500	$22,500	~~$26,500~~ $31,000	$30,000	$30,000	$30,000
900+	$22,500	$22,500	$22,500	$22,500	~~$30,000~~ $31,000	$30,000	$30,000	$30,000

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Appendix B: DEFINITIONS

AppB. Appendix B, Definition, Retuned Funds, page B-10, Amend Section:

Returned Funds: Funds that must be returned to ARB for reallocation because they are either not expended by the required funding year expenditure deadline, or are associated with an ARB ~~audit~~ Incentive Program Review mitigation measure.

APPENDIX C

COST-EFFECTIVENESS CALCULATION METHODOLOGY

A. Introduction

All projects are subject to the cost-effectiveness limit defined in Appendix G: Cost Effectiveness Limit and Capital Recovery Factors. Carl Moyer Program (Moyer) funding, funding under the air district's ~~fiduciary~~budget authority or fiduciary control, ~~other public funds from local, state, federal or any other public agency that are received by the grantee, or funding provided by a port authority (to meet the match fund requirement)~~ and all state funds must be included in determining the cost-effectiveness of surplus emission reductions. ~~Excluded from this requirement is f~~Funding provided by federal programs designed to reduce greenhouse gas emissions (GHGs) or funding provided by the Alternative and Renewable Fuel and Vehicle Technology Program to reduce GHGs do not need to be included in the cost-effectiveness calculation. Projects that include such funds must meet all other Carl Moyer Program requirements. For more details see Chapters 2 and 3.

B. General Cost-Effectiveness Calculations

1. Calculating Cost-Effectiveness

The cost-effectiveness of a project is determined by dividing the annualized cost of the potential project by the annual weighted surplus emission reductions that will be achieved by the project as shown in formula C-1 below.

Formula C-1: Cost-Effectiveness of Weighted Surplus Emission Reductions ($/ton)

$$\text{Cost-Effectiveness (\$/ton)} = \frac{\text{Annualized Cost (\$/yr}\sout{\text{year(yr)}}\text{)}}{\text{Annual Weighted Surplus Emission Reductions (tons/yr)}}$$

~~Descriptions~~ Directions on how to calculate annual emission reductions and annualized cost are provided in the ~~following~~ sections that follow.

2. Determining the Annualized Cost

Annualized cost is the amortization of the one-time incentive grant amount for the life of the project to yield an estimated annual cost. The annualized cost is calculated by multiplying the incremental cost by the capital recovery factor (CRF) from Table G-3. The resulting annualized cost is used to complete formula C-1 above to determine the cost-effectiveness of surplus emission reductions.

Formula C-2: Annualized Cost ($)

*Annualized Cost = CRF * incremental cost ($)*

3. *Calculating the Incremental Cost*

Maximum eligible percent funding amounts define incremental ~~cost,~~cost; in many cases an applicant will provide an estimate of the cost of the reduced technology. The incremental cost is determined by multiplying the cost of the reduced technology by the maximum eligible percent funding amount (from applicable chapter), as described in formula C-3 below.

Formula C-3: Incremental Cost ($)

*Incremental Cost = Cost of Reduced Technology ($) * Maximum Eligible Percent Funding Amount*

Generally the cost of the baseline vehicle for a new purchase is assumed to be a certain percentage of the cost of a new vehicle meeting reduced emissions from the standard. The cost of the baseline technology for a repower is assumed to be a percentage of the new engine. For retrofits, there is no baseline technology cost; hence the entire cost of the retrofit may be eligible for funding in most cases, but not for on-road. Refer to the On-Road chapter for specific eligible retrofit cost.
For school bus fleet modernization projects, the incremental cost is determined by adjusting the value given to the vehicle by the National Automotive Dealership Association (NADA), as described in formula C-4 below.

Formula C-4: Incremental Cost for School Bus Fleet Modernization Projects ($)

When the replacement school bus is not new, use the NADA value:

*where the NADA value is the retail value of the used school bus * 100 percent*

*when the replacement school bus is new, then use the Invoice of the new school bus * 100 percent*

Use the results from formula C-3 or C-4 to complete formula C-2 to determine the annualized cost of a project.

4. Calculating the Annual Weighted Surplus Emission Reductions

Annual weighted emission reductions are estimated by taking the sum of the project's annual surplus pollutant reductions following formula C-5 below. This will allow projects that reduce one, two, or all three of the covered pollutants to be evaluated for eligibility to receive Carl Moyer Program funding. While oxides of nitrogen (NOx) and reactive organic gases (ROG) emissions are given equal ~~weight;~~ weight, emissions of ~~diesel (~~particulate matter~~)~~ (PM) ~~have been identified as a toxic air contaminant and thus~~ carry a greater weight in the calculation. ~~However, emissions of combustion PM from gasoline, spark ignition engines have not been identified as a toxic air contaminant, therefore NOx, ROG, and PM emissions are given equal weight in the calculation.~~

Formula C-5: Annual Weighted Surplus Emission Reductions (tons/yr)

Weighted Emission Reductions =

*NOx reductions (tons/yr) + ROG reductions (tons/yr) + [20 * (PM reductions (tons/yr)]*

The result of formula C-5 is used to complete formula C-1 to determine the cost-effectiveness of surplus emission reductions.

In order to determine the annual surplus emission reductions by pollutant, formula C-15 below must be completed for each pollutant (NOx, ROG, and PM), for the baseline technology and the reduced technology, totaling up to six calculations:

Baseline Technology	Reduced Technology
1. Annual emissions of NOx	4. Annual emissions of NOx
2. Annual emissions of ROG	5. Annual emissions of ROG
3. Annual emissions of PM	6. Annual emissions of PM

These calculations are completed for each pollutant by multiplying the engine emission factor or converted emission standard (found in Appendix D) by the annual activity level and by other adjustment factors as specified for the calculation methodologies presented.

5. Calculating Annual Emission Reductions Based on Usage

Usage: The Carl Moyer Program allows the emissions reductions from a project to be calculated using the following activity factors on an annual basis:

(A) Hours of operation,
(B) Fuel consumption, or
(C) Miles traveled.

Specific activity factors allowed for each project category may differ and are identified in the source category chapters of the Carl Moyer Program Guidelines.

(A) Calculating Annual Emissions Based on Hours of Operation

When actual annual hours of equipment operation are the basis for determining emission reductions, ~~the equipment activity level must be based on a properly functioning hour meter (See Chapter 2 and the relevant source category chapter for additional information on this topic). In addition,~~ the horsepower rating of the engine and an engine load factor found in Appendix D must be used. ~~A default load factor of 0.43 is used for those projects where no specific equipment load factor is available in Appendix D.~~ The method for calculating emission reductions based on hours of operation is described in formula C-6 below.

Formula C-6: Estimated Annual Emissions <u>Reductions</u> based on hours of Operation (tons/yr)

Annual Emission<u>s</u> Reductions =

*Emission Factor or Converted Emission Standard (grams per brake horsepower-hour)(g/bhp-hr)) * Horsepower * Load Factor * Activity (hours(hrs)/yr) * Percent Operation in California (CA) * ton/907,200grams (g)*

The engine load factor is an indicator of the nominal amount of work done by the engine for a particular application. It is given as a fraction of the rated horsepower of the engine and varies with engine application. For projects in which the horsepower of the baseline technology and reduced technology are different by more than 25 percent, the load factor must be adjusted following formula C-7 below. It is important to understand the replacement load factor must never exceed 100 percent in cases where the reduced technology engine is significantly smaller than the baseline technology engine.

Formula C-7: Replacement Load Factor

*Replacement Load Factor = Load Factor $_{baseline}$ * hp $_{baseline}$/hp $_{reduced}$*

****

(B) Calculating Annual Emissions Based on Fuel Consumption

When annual fuel consumption is used for determining emission reductions, the equipment activity level must be based on annual fuel usage within California provided by the applicant. Fuel records must be maintained by the engine owner as described in the relevant source category chapter for additional information on this topic.

A fuel consumption rate factor must be used to convert emissions given in g/bhp-hr to units of grams of emissions per gallon of fuel used (g/gal). The fuel consumption rate factor is a number that combines the effects of engine efficiency and the energy content of the fuel used in that engine into an approximation of the amount of work output by an engine for each unit of fuel consumed. The fuel consumption rate factor is found in Table D-24 in Appendix D. Formulas C-8 and C-9 below are the formulas for calculating annual emissions based on annual fuel consumed.

Formula C-8: Estimated Annual Emissions based on Fuel Consumed using

Emission Factors or Converted Emission Standard (tons/yr)

Annual Emission Reductions =

*Emission Factor or Converted Emission Standard (g/bhp-hr) * fuel*

*consumption rate factor (bhp-hr/gallon (gal)) * Activity (gal/yr) * Percent*

*Operation in CA * ton/907,200g*

Formula C-9: Estimated Annual Emissions based on Fuel using Emission Factors (tons/yr)

Annual Emission Reductions =

*Emission Factor (g/gal) * Activity (gal/yr) * Percent Operation in CA * ton/907,200g*

(C) Calculating Annual Emissions Based on Annual Miles Traveled

Calculations based on annual miles traveled are used for on-road projects only. Mileage records must be maintained by the engine owner as described in Chapter 4: On-road Heavy-Duty Vehicles.

Calculating Using Emission Factors: There is no conversion since the emission factors for on-road projects provided are given in units of g/mile. Formula C-10 describes the method for calculating pollutant emissions based on emission factors and miles traveled.

Formula C-10: Estimated Annual Emissions based on Mileage using Emission Factors (tons/yr)

Annual Emission Reductions =

*Emission Factor (g/mile) * Activity (miles/yr) * Percent Operation in CA * ton/907,200g*

Calculating Annual Emissions Based on Converted Standards: The unit conversion factor found in Tables D-5 and D-6 (Appendix D) are used to convert the units of the converted emission standard (g/bhp-hr) to g/mile. Formula C-11 describes the method for calculating pollutant emissions using converted emission standards.

Formula C-11: Estimated Annual Emissions based on Mileage using Converted Emission Standards (tons/yr)

Annual Emission Reductions =

*Converted Emission Standard (g/bhp-hr) * Unit Conversion (bhp-hr/mile) * Activity (miles/yr) * Percent Operation in CA * ton/907,200g*

6. Calculating Two for One Projects

Two for One Projects: For equipment replacement of Two for One Project, two baseline technology equipment will be replaced for one reduced technology. First, calculate the emission reduction benefits based on activity for each baseline engine separately using formulas C-6, C-8 or C-10. These emission reductions will then be summed together before deducting the emission reduction benefits of the reduced

technology using formula C-13. See the sample calculations supplemental document for an example on this calculation methodology.

7. Calculating Split Project Life Projects

Split Project Life: Split Project Life Projects must use a separate project life for the two baseline technology scenarios. First, formula C-6, C-8, or C-10 must be used to calculate emission reduction by pollutant for the two baseline scenarios:

(A) Baseline technology to phase 1 reduced technology
(B) Phase 1 reduced technology to phase 2 reduced technology

Formula C-5 is used to calculate the annual emission reductions for each baseline technology. Next, a fraction of the project life must be applied to the annual emission reductions for each of the baseline scenarios, as outlined below in formula C-12.

Formula C-12: Split Project Life

Total Annual Weighted Surplus Emission Reductions =

*(Fraction project life / Total project life * Annual weighted surplus emissions from transaction 1) + Fraction project life / Total project life * Annual weighted surplus ~~transaction~~ <u>emissions</u> from transaction 2)*

Total Annual Weighted Surplus Emission Reductions = $(n_1 / t * a_1) + (n_2 / t * a_2)$

n_1 = *fraction project life from transaction 1*
n_2 = *fraction project life from transaction 2*
a_1 = *Annual weighted surplus emissions from transaction 1*
a_2 = *Annual weighted surplus ~~transaction~~ <u>emissions</u> from transaction 2*
t = *total project life*

8. *Calculating Annual Surplus Emission Reductions by Pollutant*

The final step in this portion of the calculations is to determine the annual surplus emission reductions by pollutant. For new purchases and repower projects, subtract the annual emissions for the reduced technology from the annual emissions for the baseline technology following formula C-13 below.

Formula C-13: Annual Surplus Emission Reductions by Pollutant (tons/yr) for

Repowers and New Purchases

Annual Surplus Emission Reductions (by pollutant) =

Annual Emissions for the Baseline Technology – Annual Emissions for the Reduced Technology

For retrofits, multiply the baseline technology pollutant emissions by the percent of emission reductions that the ARB-verified reduced technology is verified to following formula C-14 below.

Formula C-14: Annual Surplus Emission Reductions by Pollutant (tons/yr) for

Retrofits

Annual Surplus Emission Reductions (by pollutant) =

*Annual Emissions for the Baseline Technology * Reduced Technology Verification Percent*

Calculations must be done for each pollutant, NO_x, PM, and ROG, giving a total of three calculations.

For fleet modernization projects the baseline will be the newer vehicle emissions.

The annual surplus emission reductions by pollutant would be used in Formula C-5 to calculate the annual surplus emission reductions.

9. Calculating a Conversion from Grams to Tons per Year

Conversion to Tons per Year: Since the emission factor or converted standard is given in units of grams, a conversion from grams to tons is also required, as illustrated in formula C-15 below.

Formula C-15: Estimated Annual Emissions by Pollutant (tons/yr)

Annual Emission Reduction =

Emission Factor or Converted Emission Standard (g/bhp-hr) * Annual Activity * Adjustment Factor(s) * Percent Operation in CA * ton/907,200g

10. Calculations for ~~Comingling~~Co-Funding with Moyer and other Public Funds

Other public financial incentive funds, including tax incentives, received by the grantee directly must be deducted from the incremental cost. Air districts must request information from grantee to determine what other public financial incentive funds will be used for the project. Other public funds which are determined to be operating funds and not incentives do not need to be subtracted from the incremental cost. Advice of legal counsel is recommended to assist in determining if other public funds should be classified as incentives or operating funds. ~~If the other public financial incentive funds are not intended to be used to pay for eligible costs, then the incremental cost is not reduced by the other public financial incentive funds. Use formula C-16 below to determine the amount that is cost effective to be annualized in C-2.~~ Formula C-16 below must be used with formula C-3 for projects with co-funding to determine the maximum grant amount based on incremental cost.

Formula C-16: Incremental Cost Limit for Moyer Grant for Grantees receiving other Public Financial Incentive Funds (must be used with formula C-3 for projects with co-funding)

Maximum Moyer Grant Amount (if ~~project is~~ cost-effective) =

Incremental Cost (from formula ~~C-2 or~~ C-3) - Other Public Financial Incentive Funds (including tax rebates and credits)

In addition to Carl Moyer Program funds, air districts must also include ~~non-Moyer funds provided by the air district~~ all funds under the district's budget authority or fiduciary control plus any other state funds when calculating cost-effectiveness for the project; the total funds contributed by the air district plus all state funds must meet current cost-effectiveness limits. Use formula C-17a below (instead of formula C-2) to determine the annualized cost for projects with co-funding.

Formula C-17a: Annualized Cost for Grantees receiving other Public Financial Incentive Funds (replaces Formula C-2 for projects with co-funding)

Annualized Cost ($) =

*CRF * [Maximum Moyer Grant Amount (from formula C-16) + Air District Funds + State Funds]*

For projects that include co-funding and the maximum grant amount based on incremental cost plus other district and state funds exceeds the cost-effectiveness limit, formula C-17b must be used with formula C-18 to determine the maximum grant amount. The final Moyer grant amount for a project is derived once the state and air district funds are deducted. Use formula C-17b below to determine the amount of funds the grantee ~~will~~ may receive from the Carl Moyer Program.

Formula C-17b: Maximum Moyer Grant for Grantees receiving public funds ~~from Air District~~ (must be used with formula C-18 for projects with co-funding where the maximum grant amount based on incremental cost plus other district and state funds exceeds the cost-effectiveness limit)

Moyer Grant Amount to Grantee =

Cost-effective Grant Amount (from formula ~~C-1~~C-18) – [Air District Funds + State Funds]

Beginning July 1, 2011, federal funding from programs that reduce greenhouse gas emissions (GHGs) or funding provided by the Alternative and Renewable Fuel and Vehicle Technology Program to reduce GHGs are not required to be included in formulas C-16, C-17a and C-17b; for more details see Chapter 2 and 3.

11. Calculation for projects exceeding the Cost Effectiveness Limit

For projects that have exceeded the weighted cost effectiveness limit, the calculation methodology below must be applied in order to ensure final grant amounts meet the cost effectiveness limit requirement. The maximum grant amount is determined by multiplying the maximum allowed cost-effectiveness limit by the estimated annual emission reductions and dividing by the capital recovery factor in the C-18 formula below.

Formula C-18: Maximum Grant Amount for projects exceeding Cost Effectiveness Limit

Maximum Grant Amount =

*(Cost-effectiveness limit * estimated annual emission reductions)/CRF*

C. List of Formulas

For an easy reference, the necessary formulas to calculate the cost-effectiveness of surplus emission reductions for a project funded through the Carl Moyer Program are provided below.

Formula C-1: Cost-Effectiveness of Weighted Surplus Emission Reductions ($/ton):

$$\text{Cost-Effectiveness (\$/ton)} = \frac{\text{Annualized Cost (\$/yr)}}{\text{Annual Weighted Surplus Emission Reductions (tons/yr)}}$$

Formula C-2: Annualized Cost ($)

*Annualized Cost = CRF * incremental cost ($)*

Formula C-3: Incremental Cost ($)

Incremental Cost = Cost of Reduced Technology ($) * Maximum Eligible Percent Funding Amount

Formula C-4: Incremental Cost for School Bus Fleet Modernization Projects ($)

When the replacement school bus is not new use the NADA value

where the NADA value is the retail value of the used school bus * 100 percent.

~~when~~When the replacement school bus is new then ~~us~~ use the ~~Invoice~~ invoice of the new school bus * 100 percent

Formula C-5: Annual Weighted Surplus Emission Reductions

Weighted Emission Reductions =

NO_x reductions (tons/yr) + ROG reductions (tons/yr) + [20 * (PM reductions (tons/yr)]

Formula C-6: Estimated Annual Emissions based on hours of Operation (tons/yr)

Annual Emission Reductions =

Emission Factor or Converted Emission Standard (g/bhp-hr) * Horsepower * Load Factor * Activity (hrs/yr) * Percent Operation in CA * ton/907,200g

Formula C-7: Replacement Load Factor

Replacement Load Factor = Load Factor $_{baseline}$ * hp $_{baseline}$/hp $_{reduced}$

Formula C-8: Estimated Annual Emissions based on Fuel Consumed using Emission Factors or Converted Emission Standard (tons/yr)

Annual Emission Reductions =

Emission Factor or Converted Emission Standard (g/bhp-hr) * fuel consumption rate factor (bhp-hr/gal) * Activity (gal/yr) * Percent Operation in CA * ton/907,200g

Formula C- 9: Estimated Annual Emissions based on Fuel using Emission Factors (tons/yr)

Annual Emission Reductions =

Emission Factor (g/gal) * Activity (gal/yr) * Percent Operation in CA * ton/907,200g

Formula C-10: Estimated Annual Emissions based on Mileage using Emission Factors (tons/yr)

Annual Emission Reductions =

Emission Factor (g/mile) * Activity (miles/yr) * Percent Operation in CA * ton/907,200g

Formula C-11: Estimated Annual Emissions based on Mileage using Converted Emission Standards (tons/yr)

Annual Emission Reductions =

Converted Emission Standard (g/bhp-hr) * Unit Conversion (bhp-hr/mile) * Activity (miles/yr) * Percent Operation in CA * ton/907,200g

Formula C-12: Split Project Life

Total Annual Weighted Surplus Emission Reductions =

(Fraction project life / Total project life * Annual weighted surplus emissions from transaction 1) + Fraction project life / Total project life * Annual weighted surplus ~~transaction~~ emissions from transaction 2)

Total Annual Weighted Surplus Emission Reductions = $(n_1 / t * a_1) + (n_2 / t * a_2)$

n_1 = fraction project life from transaction 1
n_2 = fraction project life from transaction 2
a_1 = Annual weighted surplus emissions from transaction 1
a_2 = Annual weighted surplus ~~transaction~~ emissions from transaction 2
t = total project life

Formula C-13: Annual Surplus Emission Reductions by Pollutant (tons/yr) for

Repowers and New Purchases

Annual Surplus Emission Reductions (by pollutant) =

Annual Emissions for the Baseline Technology – Annual Emissions for the Reduced Technology

Formula C-14: Annual Surplus Emission Reductions by Pollutant (tons/yr) for

Retrofits

Annual Surplus Emission Reductions (by pollutant) =

Annual Emissions for the Baseline Technology * Reduced Technology Verification Percent

Formula C-15: Estimated Annual Emissions by Pollutant (tons/yr)

Annual Emission Reduction =

*Emission Factor or Converted Emission Standard (g/bhp-hr) * Annual Activity * Adjustment Factor(s) * Percent Operation in CA * ton/907,200g*

Formula C-16: Incremental Cost Limit for Moyer Grant for Grantees receiving other Public Financial Incentive Funds

Maximum Moyer Grant Amount (if ~~project is~~ cost-effective) =

Incremental Cost (from formula ~~C-2 or~~ C-3) - Other Public Financial Incentive Funds

Formula C-17a: Annualized Cost for Grantees receiving other Public Financial Incentive Funds

Annualized Cost ($) =

CRF * [Maximum Moyer Grant Amount (from formula C-16) + Air District Funds + State Funds]

Formula C-17b: Moyer Grant for Grantees receiving public funds from Air District

Moyer Grant Amount to Grantee =

Cost-effective Grant Amount (from formula ~~C-1~~ C-18) – [Air District Funds + State Funds]

Formula C-18: Maximum Grant Amount for projects exceeding Cost Effectiveness Limit

Maximum Grant Amount =

(Cost-effectiveness limit * estimated annual emission reductions)/CRF

****

APPENDIX D

TABLES FOR EMISSION REDUCTION AND COST-EFFECTIVENESS CALCULATIONS

a.) Appendix D, Tables D1 – D6, pages D-3 – D-7, Amend Tables D1-D6.

HEAVY-DUTY ON-ROAD PROJECTS

~~Table D-1a~~

Attachment II
Strikeout/Underline Language of Changes to 2011 Carl Moyer Program Guidelines

Heavy Heavy-Duty Diesel Engines
Converted Emission Standards

EO Certification Level g/bhp-hr	g/bhp-hr[a]			g/mile[b]			g/gal[c][d]		
	Diesel NOx	Diesel ROG	Alternative Fuel NOx	Diesel NOx	Diesel ROG[e]	Alternative Fuel NOx	Diesel NOx	Diesel ROG[e]	Alternative Fuel NOx
6.0 NOx	5.58	0.29	4.80	16.74	0.86	14.40	103.23	5.33	88.80
5.0 NOx	4.65	0.24	4.00	13.49	0.70	11.60	86.03	4.44	74.00
4.0 NOx	3.72	0.19	3.20	10.79	0.56	9.28	68.82	3.55	59.20
2.5 NOx+NMHC	2.21	0.11	2.00	6.41	0.33	5.80	40.86	2.11	37.00
1.8 NOx+NMHC	1.59	0.08	1.44	4.61	0.24	4.18	29.42	1.52	26.64
1.5 NOx+NMHC	1.33	0.07	1.20	3.84	0.20	3.48	24.52	1.27	22.20
1.20 NOx+NMHC	1.06	0.05	0.96	3.07	0.16	2.78	19.61	1.01	17.76
0.84 NOx+NMHC	0.74	0.04	0.67	2.15	0.11	1.95	13.73	0.71	12.43
0.20 NOx	0.19	0.13	0.16	0.54	0.37	0.46	3.44	2.36	2.96
PM10	**Diesel PM10**		**Alternative Fuel PM10**	**Diesel PM10**		**Alternative Fuel PM10**	**Diesel PM10**		**Alternative Fuel PM10**
0.01	0.008		0.010	All Except Urban Bus			0.15		0.19
				0.023		0.029			
				Urban Bus					
				0.032		0.040			
0.10	0.08		0.10	All Except Urban Bus			1.33		1.85
				0.209		0.290			
				Urban Bus					
				0.320		0.400			

a - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values and the ultra-low sulfur diesel fuel correction factors listed in Tables D-25 and D-26, respectively.

b - Mileage based emissions factors were calculated using conversion factors from Table D-28.

c - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.

d - Fuel based factors are for engines less than 750 horsepower only.

e - ROG = HC * 1.26639.

~~Table D-1b~~

~~Medium Heavy-Duty Diesel Engines 2007-2010~~
~~Converted Emission Standards~~

~~EO Certification Level g/bhp-hr~~	~~g/bhp-hr[a]~~			~~g/mile[b]~~			~~g/gal[c][d]~~		
	~~Diesel NOx~~	~~Diesel ROG~~	~~Alternative Fuel NOx~~	~~Diesel NOx~~	~~Diesel ROG[e]~~	~~Alternative Fuel NOx~~	~~Diesel NOx~~	~~Diesel ROG[e]~~	~~Alternative Fuel NOx~~
~~6.0 NOx~~	~~5.58~~	~~0.29~~	~~4.80~~	~~10.60~~	~~0.52~~	~~8.64~~	~~103.23~~	~~5.33~~	~~88.80~~
~~5.0 NOx~~	~~4.65~~	~~0.24~~	~~4.00~~	~~8.37~~	~~0.43~~	~~7.20~~	~~86.03~~	~~4.44~~	~~74.00~~
~~4.0 NOx~~	~~3.72~~	~~0.19~~	~~3.20~~	~~6.70~~	~~0.35~~	~~5.76~~	~~68.82~~	~~3.55~~	~~59.20~~
~~2.5 NOx+NMHC~~	~~2.21~~	~~0.11~~	~~2.00~~	~~3.98~~	~~0.21~~	~~3.60~~	~~40.86~~	~~2.11~~	~~37.00~~
~~1.8 NOx+NMHC~~	~~1.59~~	~~0.08~~	~~1.44~~	~~2.86~~	~~0.15~~	~~2.59~~	~~29.42~~	~~1.52~~	~~26.64~~
~~1.5 NOx+NMHC~~	~~1.33~~	~~0.07~~	~~1.20~~	~~2.39~~	~~0.12~~	~~2.16~~	~~24.52~~	~~1.27~~	~~22.20~~
~~1.20 NOx+NMHC~~	~~1.06~~	~~0.05~~	~~0.96~~	~~1.91~~	~~0.10~~	~~1.73~~	~~19.61~~	~~1.01~~	~~17.76~~
~~0.84 NOx+NMHC~~	~~0.74~~	~~0.04~~	~~0.67~~	~~1.34~~	~~0.07~~	~~1.21~~	~~13.73~~	~~0.71~~	~~12.43~~
~~0.20 NOx~~	~~0.19~~	~~0.13~~	~~0.16~~	~~0.33~~	~~0.23~~	~~0.29~~	~~3.44~~	~~2.36~~	~~2.96~~
~~PM10~~	~~Diesel PM10~~		~~Alternative Fuel PM10~~	~~Diesel PM10~~		~~Alternative Fuel PM10~~	~~Diesel PM10~~		~~Alternative Fuel PM10~~
~~0.01~~	~~0.008~~		~~0.010~~	~~All Except Urban Bus~~			~~0.15~~		~~0.19~~
				~~0.014~~		~~0.018~~			
				~~Urban Bus~~					
				~~0.032~~		~~0.040~~			
~~0.10~~	~~0.08~~		~~0.10~~	~~All Except Urban Bus~~			~~1.33~~		~~1.85~~
				~~0.130~~		~~0.180~~			
				~~Urban Bus~~					
				~~0.320~~		~~0.400~~			

~~a - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values and the ultra low-sulfur diesel fuel correction factors listed in Tables D-25 and D-26, respectively.~~

~~b - Mileage based emissions factors were calculated using conversion factors from Table D-28.~~

~~c - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.~~

~~d – Fuel based factors are for engines less than 750 horsepower only.~~

~~e – ROG = HC * 1.26639~~

~~Table D-2a~~
~~Medium Heavy-Duty Alternative Fuel Engines~~
~~Converted Emission Standards~~

~~Model Year~~	~~g/bhp-hr~~		~~g/mile[(a)]~~		~~g/gal[(b,c)]~~	
	~~NOx~~	~~PM10~~	~~NOx~~	~~PM10~~	~~NOx~~	~~PM10~~
~~1988 – 1989~~	~~6.0~~	~~0.60~~	~~11.40~~	~~1.140~~	~~111.00~~	~~11.10~~
~~1990~~	~~6.0~~	~~0.60~~	~~10.80~~	~~1.080~~	~~111.00~~	~~11.10~~
~~1991 – 1993~~	~~5.0~~	~~0.25~~	~~9.00~~	~~0.450~~	~~92.50~~	~~4.63~~
~~1994 – 1997~~	~~5.0~~	~~0.10~~	~~9.00~~	~~0.180~~	~~92.50~~	~~1.85~~
~~1998 – 2001~~	~~4.0~~	~~0.10~~	~~7.20~~	~~0.180~~	~~74.00~~	~~1.85~~
~~2002 – 2006~~	~~2.0~~	~~0.10~~	~~3.60~~	~~0.180~~	~~37.00~~	~~1.85~~
~~2007 – 2009~~	~~1.2~~	~~0.01~~	~~2.16~~	~~0.018~~	~~22.20~~	~~0.19~~
~~2010+~~	~~0.2~~	~~0.01~~	~~0.36~~	~~0.018~~	~~3.70~~	~~0.19~~

~~a - Mileage based emissions factors were calculated using conversion factors from Table D-28.~~

~~b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.~~

~~c - Fuel based factors are for engines less than 750 horsepower only.~~

~~Table D-2b~~
~~Heavy Heavy-Duty Alternative Fuel Engines~~
~~Converted Emission Standards~~

~~Model Year~~	~~g/bhp-hr~~		~~g/mile[(a)]~~		~~g/gal[(b,c)]~~	
	~~NOx~~	~~PM10~~	~~NOx~~	~~PM10~~	~~NOx~~	~~PM10~~
~~1988 – 1989~~	~~6.0~~	~~0.60~~	~~18.60~~	~~1.860~~	~~111.00~~	~~11.10~~
~~1990~~	~~6.0~~	~~0.60~~	~~18.00~~	~~1.800~~	~~111.00~~	~~11.10~~
~~1991 – 1993~~	~~5.0~~	~~0.25~~	~~15.00~~	~~0.750~~	~~92.50~~	~~4.63~~
~~1994 – 1997~~	~~5.0~~	~~0.10~~	~~14.50~~	~~0.290~~	~~92.50~~	~~1.85~~
~~1998 – 2001~~	~~4.0~~	~~0.10~~	~~11.60~~	~~0.290~~	~~74.00~~	~~1.85~~
~~2002 – 2006~~	~~2.0~~	~~0.10~~	~~5.80~~	~~0.290~~	~~37.00~~	~~1.85~~
~~2007 – 2009~~	~~1.2~~	~~0.01~~	~~3.48~~	~~0.029~~	~~22.20~~	~~0.19~~
~~2010+~~	~~0.2~~	~~0.01~~	~~0.58~~	~~0.029~~	~~3.70~~	~~0.19~~

~~a - Mileage based emissions factors were calculated using conversion factors from Table D-28.~~

~~b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.~~

~~c - Fuel based factors are for engines less than 750 horsepower only.~~

~~**Table D-3**~~

~~**Diesel Medium Heavy-Duty Vehicles 14,001-33,000 pounds (lbs) Gross Vehicle Weight Rating (GVWR)**~~

~~**Emission Factors (g/mile)**[(a)]~~

~~Model Year~~	~~NOx~~	~~ROG~~	~~PM10~~
~~Pre-1984~~	~~17.21~~	~~0.29~~	~~0.792~~
~~1984 – 1986~~	~~16.65~~	~~0.29~~	~~0.720~~
~~1987 – 1989~~	~~14.60~~	~~0.18~~	~~0.504~~
~~1990~~	~~14.60~~	~~0.18~~	~~0.504~~
~~1991 – 1993~~	~~12.18~~	~~0.16~~	~~0.288~~
~~1994 – 1997~~	~~10.70~~	~~0.10~~	~~0.216~~
~~1998 – 2002~~	~~9.77~~	~~0.08~~	~~0.144~~
~~2003+~~	~~5.39~~	~~0.08~~	~~0.216~~
~~2004 – 2006~~	~~5.12~~	~~0.08~~	~~0.216~~
~~2007 – 2009~~	~~2.79~~	~~0.05~~	~~0.024~~
~~2010+~~	~~0.51~~	~~0.02~~	~~0.024~~

~~a - Emission factors incorporate the ultra low-sulfur diesel fuel correction factors in Table D-26.~~

~~**Table D-4**~~

~~**Diesel Heavy Heavy-Duty Vehicles 33,000+ lbs GVWR**~~

~~**Emission Factors (g/mile)**~~[~~(a)~~]

~~Model Year~~	~~NOx~~	~~ROG~~	~~PM10~~
~~Pre-1987~~	~~21.39~~	~~1.04~~	~~1.249~~
~~1987 – 1988~~	~~21.11~~	~~0.81~~	~~1.354~~
~~1989 – 1990~~	~~21.11~~	~~0.81~~	~~1.354~~
~~1991 – 1993~~	~~18.23~~	~~0.54~~	~~0.562~~
~~1994 – 1997~~	~~17.95~~	~~0.4~~	~~0.367~~
~~1998 – 2002~~	~~17.58~~	~~0.51~~	~~0.403~~
~~2003 – 2006~~	~~11.63~~	~~0.26~~	~~0.252~~
~~2007 – 2009~~	~~6.36~~	~~0.23~~	~~0.028~~
~~2010+~~	~~1.06~~	~~0.18~~	~~0.028~~

~~a - Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-26.~~

~~Table D-5~~

~~Diesel Urban Buses~~

~~Converted Emission Standards~~

~~Model Year~~	~~g/bhp-hr~~			~~g/mile[a]~~			~~g/gal[b,c]~~		
	~~NOx~~	~~ROG~~	~~PM10~~	~~NOx~~	~~ROG~~	~~PM10~~	~~NOx~~	~~ROG~~	~~PM10~~
~~1987 – 1990[d]~~	~~5.58~~	~~1.17~~	~~0.432~~	~~22.32~~	~~4.68~~	~~1.728~~	~~103.23~~	~~21.65~~	~~7.99~~
~~1991 – 1993[d]~~	~~4.65~~	~~1.17~~	~~0.072~~	~~18.60~~	~~4.68~~	~~0.288~~	~~86.03~~	~~21.65~~	~~1.33~~
~~1994 – 1995[d]~~	~~4.65~~	~~1.17~~	~~0.050~~	~~18.60~~	~~4.68~~	~~0.200~~	~~86.03~~	~~21.65~~	~~0.93~~
~~1996 – 2002[d]~~	~~3.72~~	~~1.17~~	~~0.036~~	~~14.88~~	~~4.68~~	~~0.144~~	~~68.82~~	~~21.65~~	~~0.67~~
~~2003[d,e]~~	~~2.21~~	~~0.12~~	~~0.007~~	~~8.84~~	~~0.48~~	~~0.028~~	~~40.89~~	~~2.22~~	~~0.13~~
~~2004 – 2006[f]~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~2007 – 2009~~	~~1.20~~	~~0.19~~	~~0.010~~	~~4.80~~	~~0.76~~	~~0.040~~	~~22.20~~	~~3.52~~	~~0.19~~
~~2010+~~	~~0.20~~	~~0.19~~	~~0.010~~	~~0.80~~	~~0.76~~	~~0.040~~	~~3.70~~	~~3.52~~	~~0.19~~

~~a - Mileage based emissions factors were calculated using conversion factors from Table D-28.~~

~~b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.~~

~~c - Fuel based factors are for engines less than 750 horsepower only.~~

~~d - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values and the ultra low-sulfur diesel fuel correction factors listed in Tables D-25 and D-26, respectively.~~

~~e - NOx +NMHC emission standard converted to NOx and ROG.~~

~~f - No diesel buses have been certified to the 0.5 g/bhp-hr for the 2004-2006 model year emission standard.~~

~~**Table D-6**~~

~~**Natural Gas Urban Buses**~~

~~**Converted Emission Standards**~~

~~Model Year~~	~~g/bhp-hr~~		~~g/mile[a]~~		~~g/gal[b,c]~~	
	~~NOx~~	~~PM10~~	~~NOx~~	~~PM10~~	~~NOx~~	~~PM10~~
~~1991 – 1993~~	~~5.00~~	~~0.100~~	~~20.00~~	~~0.40~~	~~92.50~~	~~1.85~~
~~1994 – 1995~~	~~5.00~~	~~0.070~~	~~20.00~~	~~0.28~~	~~92.50~~	~~1.30~~
~~1996 – 1997~~	~~4.00~~	~~0.050~~	~~16.00~~	~~0.20~~	~~74.00~~	~~0.93~~
~~1998 – 2002[e]~~	~~2.50~~	~~0.050~~	~~10.00~~	~~0.20~~	~~46.25~~	~~0.93~~
~~2003 – 2006[d,e,f]~~	~~1.44~~	~~0.020~~	~~5.76~~	~~0.08~~	~~26.64~~	~~0.37~~
~~2007 – 2009~~	~~1.20~~	~~0.010~~	~~4.80~~	~~0.04~~	~~22.20~~	~~0.19~~
~~2010+~~	~~0.20~~	~~0.010~~	~~0.80~~	~~0.04~~	~~3.70~~	~~0.19~~

~~a - Mileage based emissions factors were calculated using conversion factors from Table D-28.~~

~~b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.~~

~~c - Fuel based factors are for engines less than 750 horsepower only.~~

~~d - NOx+NMHC emission standard converted to NOx only.~~
~~e - A majority of the natural gas urban buses have been certified to the optional standards. Therefore, these values are based on the optional standards.~~
~~f - Many natural gas urban buses have been certified to optional standards below this level.~~

Table D-1
Diesel Engines
Medium Heavy-Duty and Heavy Heavy-Duty
Converted Emission Standards for Fuel Based Usage Calculations

EO Certification Standards g/hbp-hr		NOx	ROG[(a)]	PM10
		g/gal[(b)(c)(d)]		
6.0 NOx	0.60 PM10	103.23	5.33	7.992
5.0 NOx	0.25 PM10	86.03	4.44	3.330
5.0 NOx	0.10 PM10	86.03	4.44	1.332
4.0 NOx	0.10 PM10	68.82	3.55	1.332
2.5 NOx + NMHC	0.10 PM10	40.86	2.11	1.332
1.8 NOx + NMHC	0.01 PM10	29.42	1.52	0.148
1.5 NOx + NMHC	0.01 PM10	24.52	1.27	0.148
1.2 NOx + NMHC	0.01 PM10	19.61	1.01	0.148
0.84 NOx + NMHC	0.01 PM10	13.73	0.71	0.148
0.5 NOx	0.01 PM10	8.60	0.44	0.148
0.2 NOX	0.01 PM10	3.44	0.18	0.148

a - ROG = HC * 1.26639.
b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.
c - Fuel based factors are for engines less than 750 horsepower only.
d - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values and the ultra low-sulfur diesel fuel correction factors listed in Tables D-25 and D-26, respectively.

Table D-2
Alternative Fuel Engines
Medium Heavy-Duty and Heavy Heavy-Duty
Converted Emission Standards for Fuel Based Usage Calculations

EO Certification Standards g/hbp-hr		NOx	ROG[(a)]	PM10
		g/gal[(b)(c)(d)]		
6.0 NOx	0.60 PM10	111.00	35.14	11.100
5.0 NOx	0.25 PM10	92.50	29.29	4.625
5.0 NOx	0.10 PM10	92.50	29.29	1.850
4.0 NOx	0.10 PM10	74.00	23.43	1.850
2.5 NOx + NMHC	0.10 PM10	37.00	11.71	1.850
1.8 NOx + NMHC	0.01 PM10	26.64	8.43	0.185
1.5 NOx + NMHC	0.01 PM10	22.20	7.03	0.185
1.2 NOx + NMHC	0.01 PM10	17.76	5.62	0.185
0.84 NOx + NMHC	0.01 PM10	12.43	3.94	0.185
0.50 NOx	0.01 PM10	9.25	2.93	0.185
0.20 NOX	0.01 PM10	3.70	1.17	0.185

a - ROG = HC * 1.26639.
b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.
c - Fuel based factors are for engines less than 750 horsepower only.
d - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values listed in Table D-25.

Table D-3
Medium Heavy-Duty Vehicles
Emission Factors for Mileage Based Calculations (g/mile)[a]

Model Year	Diesel[b]		
	NOx	ROG[c]	PM10
Pre-1987	14.52	0.75	0.69
1987-1990	14.31	0.59	0.75
1991-1993	10.70	0.26	0.41
1994-1997	10.51	0.20	0.23
1998-2002	10.33	0.20	0.25
2003-2006	6.84	0.13	0.16
2007-2009	4.01	0.11	0.02
2007-2009 (0.5 g/bhp-hr NOx or Cleaner)[d]	1.73	0.10	0.017
2010+	0.74	0.09	0.02

a - EMFAC 2011 Zero-Mile Based Emission Factors.
b - Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-26.
c - ROG = HC * 1.26639.
d - Use interpolated values assuming 1.2 g/bhp-hr NOx Standards for 2007-2009 Model Year Grouping and 0.2 g/bhp-hr NOx Standards for 2010+ Model Years.

Table D-4
Heavy Heavy-Duty Vehicles
Emission Factors for Mileage Based Calculations (g/mile)[a]

Model Year	Diesel[b]		
	NOx	ROG[c]	PM10
Pre-1987	21.37	1.09	1.25
1987-1990	21.07	0.86	1.35
1991-1993	18.24	0.56	0.56
1994-1997	17.92	0.42	0.37
1998-2002	17.61	0.43	0.40
2003-2006	11.64	0.27	0.25
2007-2009	6.62	0.23	0.03
2007-2009 (0.5 g/bhp-hr NOx or Cleaner)[d]	2.88	0.20	0.028
2010+	1.27	0.19	0.03

a - EMFAC 2011 Zero-Mile Based Emission Factors.
b - Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-26.
c - ROG = HC * 1.26639.
d - Use interpolated values assuming 1.2 g/bhp-hr NOx Standards for 2007-2009 Model Year Grouping and 0.2 g/bhp-hr NOx Standards for 2010+ Model Years.

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Table D-5
Diesel Urban Buses
Converted Emission Standards

EO Certification Standards[f] g/hbp-hr		NOx	ROG[a]	PM10	NOx	ROG[a]	PM10
		g/mile[b]			g/gal[c][d][e]		
6.0 NOx	0.6 PM10	22.32	1.15	1.73	103.23	5.33	7.99
5.0 NOx	0.1 PM10	18.60	0.96	0.29	86.03	4.44	1.33
5.0 NOx	0.07 PM10	18.60	0.96	0.20	86.03	4.44	0.93
4.0 NOx	0.05 PM10	14.88	0.77	0.14	68.82	3.55	0.67
2.5 NOx + NMHC	0.05 PM10	8.84	0.46	0.14	40.86	2.11	0.67
1.20 NOx	0.01 PM10	4.46	0.23	0.03	20.65	1.07	0.15
0.20 NOx	0.01 PM10	0.74	0.04	0.03	3.44	0.18	0.15

a - ROG = HC * 1.26639.
b - Mileage based emissions factors were calculated using conversion factors from Table D-28.
c - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.
d - Fuel based factors are for engines less than 750 horsepower only.
e - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values listed in Table D-25.
f - No diesel buses have been certified to the 0.5 g/bhp/hr for the 2004-2006 model year emission standard.

Table D-6
Natural Gas Urban Buses
Converted Emission Standards

EO Certification Standards g/hbp-hr		NOx	ROG[(a)]	PM10	NOx	ROG[(a)]	PM10
		g/mile[(b)]			g/gal[(c)(d)(e)]		
5.0 NOx	0.10 PM10	20.00	6.33	0.40	92.50	29.29	1.85
5.0 NOx	0.07 PM10	20.00	6.33	0.28	92.50	29.29	1.30
4.0 NOx	0.05 PM10	16.00	5.07	0.20	74.00	23.43	0.93
2.5 NOx + NMHC	0.05 PM10	8.00	2.53	0.20	37.00	11.71	0.93
1.8 NOx + NMHC[(f)(g)]	0.02 PM10	5.76	1.82	0.08	26.64	8.43	0.37
1.2 NOx	0.01 PM10	4.80	1.52	0.04	22.20	7.03	0.19
0.2 NOx	0.01 PM10	0.80	0.25	0.04	3.70	1.17	0.19

a - ROG = HC * 1.26639.
b - Mileage based emissions factors were calculated using conversion factors from Table D-28.
c - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.
d - Fuel based factors are for engines less than 750 horsepower only.
e - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values listed in Table D-25.
f - A majority of the natural gas urban buses have been certified to the optional standards. Therefore, these values are based on the optional standards.
g - Many natural gas urban buses have been certified to optional standards below this level.

b**.)** Appendix D, Table D-7 and Table D-8, page D-8, Delete Tables D-7 and D-8:

Table D-7
Transport Refrigeration Units (TRU) and Auxiliary Power Unit (APU) Default Load Factors - DELETED

~~Category~~	~~Horsepower~~	~~Load Factor~~
~~TRU~~	~~<25~~	~~0.64~~
	~~25 – 50~~	~~0.53~~
~~APU~~	~~<25~~	~~0.74~~

Table D-8
TRU and APU Emission Factors (g/bhp-hr) - DELETED

~~Horsepower~~	~~Tier / Model Year~~	~~NOx~~	~~ROG~~	~~PM10~~
~~< 11~~	~~Pre-1995~~	~~9.30~~	~~1.80~~	~~0.720~~
	~~1995 – 1999~~	~~8.70~~	~~1.26~~	~~0.410~~
	~~Tier 1~~	~~5.76~~	~~0.82~~	~~0.376~~
	~~Tier 2~~	~~4.14~~	~~0.59~~	~~0.304~~
	~~Tier 4~~	~~4.14~~	~~0.59~~	~~0.152~~
~~11 – 24~~	~~Pre-1995~~	~~6.44~~	~~2.21~~	~~0.550~~
	~~1995 – 1999~~	~~6.44~~	~~1.08~~	~~0.413~~
	~~Tier 1~~	~~5.49~~	~~0.77~~	~~0.306~~
	~~Tier 2~~	~~4.33~~	~~0.69~~	~~0.306~~
	~~Tier 4~~	~~4.33~~	~~0.69~~	~~0.152~~
~~25 – 49~~	~~Uncontrolled pre-1988~~	~~6.51~~	~~2.21~~	~~0.547~~
	~~Uncontrolled 1988 +~~	~~6.42~~	~~2.17~~	~~0.547~~
	~~Tier 1~~	~~5.26~~	~~1.74~~	~~0.480~~
	~~Tier 2~~	~~4.63~~	~~0.29~~	~~0.280~~
	~~Tier 4 Interim~~	~~4.55~~	~~0.12~~	~~0.128~~
	~~Tier 4 Final~~	~~2.75~~	~~0.12~~	~~0.008~~

c.) Appendix D, Table D-10.1, pages D-10 - D-11 and Table D-13, pages D-15 - D-16, Amend Tables D-10 and D-13:

OFF-ROAD PROJECTS AND NON-MOBILE AGRICULTURAL PROJECTS

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d.) Appendix D, Table D-10, pages D-10 - D-11 and Table D-13, pages D-15 - D-16, Amend Tables D-10 and D-13:

OFF-ROAD PROJECTS AND NON-MOBILE AGRICULTURAL PROJECTS

Amend Table:

Table D-10
Off-Road Diesel Engines Default Load Factors

Category	Equipment Type	Load Factor
Airport Ground Support	Aircraft Tug	0.54
	Air Conditioner	0.75
	Air Start Unit	0.90
	Baggage Tug	0.37
	Belt Loader	0.34
	Bobtail	0.37
	Cargo Loader	0.34
	Cargo Tractor	0.36
	Forklift	0.20
	Ground Power Unit	0.75
	Lift	0.34
	Passenger Stand	0.40
	Service Truck	0.20
	Other GSE	0.34
Agricultural (Mobile, Portable or Stationary)	Agricultural Mowers	0.43
	Agricultural Tractors	0.70
	Balers	0.58
	Combines/Choppers	0.70
	Chippers/Stump Grinders	0.73
	Generator Sets	0.74
	Hydro Power Units	0.48
	Irrigation Pump	0.65
	Shredders	0.40
	Sprayers	0.50
	Swathers	0.55
	Tillers	0.78
	Other Agricultural	0.51
Construction	Air Compressors	0.48
	Bore/Drill Rigs	0.50
	Cement & Mortar Mixers	0.56
	Concrete/Industrial Saws	0.73
	Concrete/Trash Pump	0.74
	Cranes	0.29
	Crawler Tractors	0.43
	Crushing/Process Equipment	0.78
	Excavators	0.38
	Graders	0.41
	Off-Highway Tractors	0.44

	Off-Highway Trucks	0.38
	Pavers	0.42

Category	Equipment Type	Load Factor
Construction	Other Paving	0.36
	Pressure Washer	0.30
	Rollers	0.38
	Rough Terrain Forklifts	0.40
	Rubber Tired Dozers	0.40
	Rubber Tired Loaders	0.36
	Scrapers	0.48
	Signal Boards	0.78
	Skid Steer Loaders	0.37
	Surfacing Equipment	0.30
	Tractors/Loaders/Backhoes	0.37
	Trenchers	0.50
	Welders	0.45
	Other Construction Equipment	0.42
Industrial	Aerial Lifts	0.31
	Forklifts	0.20
	Sweepers/Scrubbers	0.46
	Other General Industrial	0.34
	Other Material Handling	0.40
Logging	Fellers/Bunchers	0.71
	Skidders	0.74
Oil Drilling	Drill Rig	0.50
	Lift (Drilling)	0.60
	Swivel	0.60
	Workover Rig (Mobile)	0.50
	Other Workover Equipment	0.60
Cargo Handling	Container Handling Equipment	0.59
	Cranes	0.43
	Excavators	0.57
	Forklifts	0.30
	Other Cargo Handling Equipment	0.51
	Sweeper/Scrubber	0.68
	Tractors/Loaders/Backhoes	0.55
	Yard Trucks	0.65
~~Non-Mobile Agricultural Engines~~	~~Irrigation Pump~~	~~0.65~~
	~~Other~~	~~0.51~~
Other	All	0.43

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Amend Table:

LARGE SPARK IGNITION ENGINES

Table D-13
Off-Road LSI Equipment Default Load Factors

Category	Equipment Type	Load Factor
Agriculture (Mobile, Portable or Stationary)	Agricultural Tractors	0.62
	Balers	0.55
	Combines/Choppers	0.74
	Chipper/Stump Grinder	0.78
	Generator Sets	0.68
	Sprayers	0.50
	Swathers	0.52
	Pumps	0.65
	Other Agricultural Equipment	0.55
Airport Ground Support	A/C Tug	0.80
	Baggage Tug	0.55
	Belt Loader	0.50
	Bobtail	0.55
	Cargo Loader	0.50
	Forklift	0.30
	Ground Power Unit	0.75
	Lift	0.50
	Passenger Stand	0.59
	Other GSE	0.50
Construction	Air Compressors	0.56
	Asphalt Pavers	0.66
	Bore/Drill Rigs	0.79
	Concrete/Industrial Saws	0.78
	Concrete/Trash Pump	0.69
	Cranes	0.47
	Gas Compressor	0.85
	Paving Equipment	0.59
	Pressure Washer	0.85
	Rollers	0.62
	Rough Terrain Forklifts	0.63
	Rubber Tired Loaders	0.54
	Skid Steer Loaders	0.58
	Tractors/Loaders/Backhoes	0.48
	Trenchers	0.66
	Welder	0.51

	Other Construction	0.48
Industrial	Aerial Lifts	0.46
	Forklifts	0.30
	Sweepers/Scrubbers	0.71
	Other Industrial	0.54