## FINAL REGULATION ORDER

Amend section 2293.2 and Appendix 1 of Subarticle 2, title 13, California Code of Regulations, to read as follows:

[Note: The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions from the existing regulatory text. All portions that remain unchanged from the originally proposed regulation are indicated by the symbol "* * * * * *" for reference.]

### SUBARTICLE 2. COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS

### § 2293.2. Definitions.

(a) For the purposes of this subarticle, the definitions in Health and Safety Code sections 39010 through 39060 shall apply, except as otherwise specified in this subarticle. The following definitions shall also apply to this subarticle:

* * * * * *

(10.5) "Designated Equivalent Limits Diesel" means a commercial California diesel fuel or blend of commercial California diesel fuels, produced at a California refinery or refineries, that meets the requirements of 13 CCR 2282(h) and may contain 2-ethyl-hexyl nitrate. Designated Equivalent Limits Diesel does not contain biodiesel or di-tert-butyl peroxide (DTBP).

(10.6) "Diesel Test Fuel" means a fuel against which alternative diesel fuels are tested for emission-equivalency and certification. Designated Equivalent Limits Diesel and Reference CARB Diesel are Diesel Test Fuels.

(10.7) "Emissions Test Facility" means an independent test facility that conducts dynamometer exhaust emissions testing for certification of alternative diesel fuels or additives resulting in emissions equivalence with diesel.

(15.5) "Independent Laboratory" means a facility that tests composition and fuel properties for each candidate fuel and each component of each candidate fuel received from the emissions test.

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**NOTE:** Authority cited: Sections 39600, 39601, 39667, 43013, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 40000, 43000, 43016, 43018, 43101, 43830.8 and 43865, Health and Safety Code: and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

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***Appendix 1 of Subarticle 2. In-use Requirements for Pollutant Emissions Control***

A person subject to the Stage 3A in-use requirements (section 2293.62293.5(c)) may meet the in-use requirements imposed above the Pollutant Control Trigger Level by implementing any of the following in-use requirements as applicable, either alone or in combination:

Additives or ADF formulations approved for NOx emission control purposes, pursuant to section (a)(1) of this appendix, additives or ADF formulations certified as emissions equivalent to CARB Diesel or better pursuant to section (a)(2) of this appendix an ADF-CARB diesel blend certified as emissions equivalent to CARB diesel or better, a neat ADF finished fuel certified as emissions equivalent to CARB diesel or better, or other options certified by the Executive Officer for this purpose.

(a) Biodiesel:

(1) Approved Emissions Equivalent Additives and ADF Formulations:

The following list shows the additive and required amounts by saturation and blend level, as well as approved blends for Alternative Diesel Fuel formulations:

(A) Di-tert-butyl peroxide (DTBP): Biodiesel blends above the NOx emission control trigger level that contain DTBP by volume in the amounts specified in the table below meet the in-use requirements for biodiesel.

Table A.5: DTBP NOx Control Blend Level

| **Biodiesel Saturation Level** | **Biodiesel Blend Level** | **Required level of DTBP (volume percent of blend)*** |
|---|---|---|
| Low Saturation | >B5 to <B10 | 0.5 minimum |
| | B10 to <B15 | 0.75 minimum |
| | B15 to B20 | 1.0 minimum |
| High Saturation | B10 to <B15 | 0.25 minimum |
| | B15 to B20 | 0.5 minimum |

* The U.S. Environmental Protection Agency regulates the use of DTBP and other diesel additives under 40 Code of Federal Regulation part 79. Use of DTBP must comply with all federal requirements and limitations, including blend volume limits specified on product labeling.

(B) [Reserved]Approved ADF Formulations

1. Renewable hydrocarbon diesel formulation 1: Blends consisting solely of renewable hydrocarbon diesel at not less

than 75 percent by volume, biodiesel, and CARB diesel, where the total biodiesel content of the blend does not exceed 20 percent by volume.

2. Renewable hydrocarbon diesel formulation 2: Blends consisting solely of renewable hydrocarbon diesel at not less than 55 percent by volume, biodiesel, and CARB diesel, where the total biodiesel content of the blend does not exceed 20 percent by volume.

(2) Certification of Alternative Diesel Fuels or Additives Resulting in Emissions Equivalence with Diesel

(A) Upon application of any producer or importer, the Executive Officer may certify alternative diesel fuel formulations or additives in accordance with (a)(2) of this appendix.

1. The applicant shall initially submit a proposed test protocol to the Executive Officer. The proposed test protocol shall include:

a. The identity~~y~~ies and attestations of independence of the entity~~y~~ies proposed to conduct and the entities proposed to observe and verify the tests described in (a)(2)(F) of this appendix;

b. Test procedures consistent with the requirements of (a)(2) of this appendix;

c. Product sources of the biodiesel additive certification fuel, Diesel Test Fuels, and other fuel blending components including ADF formulation components such as renewable hydrocarbon diesel, and additives, blending verification reports, and ~~T~~test data for the results of analyses of all fuel blending components, additives, and test fuels, sent by each emissions test facility to the same independent laboratory, showing that the proposed~~fuel to be used as the~~ biodiesel additive certification fuel and Diesel Test Fuels~~Reference CARB Diesel~~ satisfy~~ies~~ the specifications identified in (a)(2)(D) and (a)(2)(E) of this appendix;

d. Reasonably adequate quality assurance and quality

control procedures; and

e. Notification of any outlier identification and exclusion procedure that will be used, and a demonstration that any such procedure meets generally accepted statistical principles.; and

f. Demonstration that use of the proposed ADF additive or formulation to mitigate NOx emissions is based on sound principles of science and engineering. Such a basis may be demonstrated with data from peer-reviewed journal articles or a description of the proposed chemical mechanism of pollutant reduction during combustion along with preliminary test data and independent academic analysis.

2. Within 20 business days of receipt of a proposed test protocol, the Executive Officer shall advise the applicant in writing either that it is complete or that specified additional information is required to make it complete. Within 15 business days of submittal of additional information, the Executive Officer shall advise the applicant in writing either that the information submitted makes the proposed test protocol complete or that specified additional information is still required to make it complete. Within 20 business days after the proposed test protocol is deemed complete, the Executive Officer shall either approve the test protocol as consistent with (a)(2) of this appendix or advise the applicant in writing of the changes necessary to make the test protocol consistent with (a)(2) of this appendix. Any notification of approval of the test protocol shall include the name, telephone number, and address of the Executive Officer's designee to receive notifications pursuant to (a)(2)(F) of this appendix, and the address of the California Air Resources Board facility to which retained test fuel, additive, and blending component samples shall be shipped. The tests shall not be conducted until the protocol is approved by the Executive Officer.After the test protocol has been approved by the Executive Officer, and before the beginning of any emissions testing, each emissions test facility shall ship to the California Air Resources Board retained samples of all test fuels, additives, and blending components, identical in composition and volume to the samples sent to the independent laboratory for analyses. The emission tests shall not be conducted until the

Executive Officer has notified the applicant in writing that the retained samples have been received by the California Air Resources Board facility.

3. Upon completion of the tests, the applicant may submit an application for certification to the Executive Officer. The application shall include the approved test protocol, all of the test data, a copy of ~~the~~each complete test log prepared in accordance with (a)(2)(F) of this appendix, ~~a~~ demonstrations that the candidate fuels meet~~s~~ the requirements for certification set forth in (a)(2)(C) of this appendix, verification reports by independent, state-licensed professional engineers describing the observation that they undertook and any ways in which the testing or blending deviated from the requirements of this appendix, and such other information as the Executive Officer may reasonably require.

4. Within 20 business days of receipt of an application, the Executive Officer shall advise the applicant in writing either that it is complete or that specified additional information is required to make it complete. Within 15 business days of submittal of additional information, the Executive Officer shall advise the applicant in writing either that the information submitted makes the application complete or that specified additional information is still required to make it complete. Within 20 business days after the application is deemed complete, the Executive Officer shall grant or deny the application. Any denial shall be accompanied by a written statement of the reasons for denial.

(B) The candidate fuels.

The biodiesel additive certification fuel, Diesel Test Fuels, additives, and any other candidate fuel blending components, including ADF formulation components such as renewable hydrocarbon diesel, shall be shipped directly from their product source facilities to each emissions test facility for analysis, blending, and emission testing. Each emissions test facility shall ship samples of each biodiesel additive certification fuel and diesel test fuel to the same independent laboratory for analysis. Each candidate fuel and each component of each candidate fuel shall be analyzed for composition and properties as required under (a)(2)(B)1, (B)2, (C), (D), and (E) of this appendix by the same independent laboratory, separately for each emissions test

facility. The biodiesel additive certification fuel, Diesel Test Fuels, additives, and other candidate fuel blending components shall be analyzed to determine compliance with applicable specifications before the blending of the candidate fuels. Each candidate fuel shall be blended at the test facility where it will undergo emissions testing, and the blending shall be observed by an independent, state-licensed professional engineer. Verification of the candidate fuel blending shall be submitted with the analysis results for each candidate fuel and each candidate fuel component along with the proposed test protocol. The candidate fuels to be used in the comparative testing described in (a)(2)(F) of this appendix shall be one of the following:

1. ADF formulation: The candidate fuels shall be the same fuel blendstock or fuel blend that the applicant is attempting to certify. Results of each analysis of the fuel blendstock or fuel blend for properties and composition by the independent laboratory shall be provided with the proposed test protocol. If the applicant is attempting to certify a fuel blend such as a biodiesel with a heightened fuel specification or biodiesel produced utilizing a specified production technology, that blend shall consist of the fuel blendstock blended to 20 percent with the Reference CARB Diesel for two emission tests and with the Designated Equivalent Limits Diesel for the third test. The applicant shall report all of the candidate fuel properties under (a)(2)(~~D~~C) of this appendix for ~~the~~each candidate fuel sent by each emissions test facility to the independent laboratory.

2. Biodiesel additives: The candidate fuels shall be a mixture of the additive to be certified at the concentration specified by the applicant and the biodiesel additive certification fuel blendstock ~~properties~~ specified in (a)(2)(D) of this appendix. Results of each chemical analysis of the additive formulation by the independent laboratory shall be provided with the proposed test protocol. If the additive to be certified is meant to be used in B20 fuel blends, the candidate fuels shall be a mixture of the additive to be certified at the concentration specified by the applicant and the biodiesel additive certification fuel specified in (a)(2)(D) of this appendix blended to 20 volume percent biodiesel content with the Reference CARB Diesel for two emission tests and with the Designated Equivalent Limits Diesel for the third test. The applicant shall report all of the candidate fuel properties under (a)(2)(C) of this

appendix for ~~both~~ the certification fuel without the additive, and ~~the~~each candidate fuel sent by each emissions test facility to the independent laboratory.

(C) Candidate fuel properties.

1. The applicant shall report all of the properties listed below for ~~the~~each candidate fuel. ~~The~~Each candidate fuel shall be representative of the fuel that the applicant will produce commercially and shall not contain streams or feedstocks that will not be used in the commercial fuel that the applicant intends to sell. If the E~~e~~xecutive O~~o~~fficer determines that ~~the~~a candidate fuel contains streams or feedstocks that will not be used in the commercial fuel, this will be grounds for rejection of the application.

2. The following documents are incorporated by reference:

a. ASTM D5186-03, "Standard Test Method for Determination of the Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels and Aviation Turbine Fuels by Supercritical Fluid Chromatography (2009)."

b. ASTM D4629-12, "Standard Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection (2012)."

c. ASTM D445-14e2, "Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity) (2014)."

d. ASTM D93-13e1, "Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester (2013)."

e. ASTM D86-12, "Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure (2012)."

f. EN 14103:2011, "Fat and oil derivatives. Fatty acid methyl esters (FAME). Determination of ester and linolenic acid methyl ester contents (2011)."

Table A.7: Candidate Ffuel Pproperties

| Property | Test Method |
|---|---|
| Sulfur Content | ASTM D5453-93 |
| Aromatic Hydrocarbon Content, Volume % | ASTM D5186-03(2009) |
| Polycyclic Aromatic Content, Weight % | ASTM D5186-03(2009) |
| Nitrogen Content | ASTM D4629-12 |
| ~~Unadditized~~ Cetane Number | ASTM D613-14, ASTM D6890-13be1, ASTM D7170-14; or ASTM D7668-14a |
| API Gravity | ASTM D287-12b |
| Viscosity at 40°C, cSt | ASTM D445-14e2 |
| Flash Point, °F, minimum | ASTM D93-13e1 |
| Distillation, °F | ASTM D86-12 |
| Initial Boiling Point | |
| 10 % Recovered | |
| 50 % Recovered | |
| 90 % Recovered | |
| End Point | |
| FAME Content % | EN14103:2011 |

(D) Biodiesel Aadditive Ceertification Ffuel.

The biodiesel additive certification fuel shall be a biodiesel (fatty acid methyl ester) produced by transesterification of low saturation feedstock with the following properties.

Table A.8: Biodiesel Additive Ceertification Ffuel ~~blendstock~~ Pproperties

| Property | Test Method | Fuel Specifications |
|---|---|---|
| Sulfur Content | ASTM D5453-93 | 15 ppm maximum |
| Nitrogen Content | ASTM D4629-12 | 10 ppm maximum |
| Unadditized Cetane Number (Each of 3 measurements with equipment and operator same as for Diesel Test Fuels) | ASTM D613-14, ASTM D6890-13be~~l~~1, ASTM D7170-14; or ASTM D7668-14a | 47.0 – 50.0 |
| API Gravity | ASTM D287-12b | 27.0 – 33.0 |
| Viscosity at 40°C, cSt | ASTM D445-14e2 | 1.9 - 6.0 |
| Flash Point, °F, minimum | ASTM D93-13e1 | 266 |
| Distillation, °F | ASTM D86-12 | |
| 90 % Recovered | | 620 - 680 |

| | | |
|---|---|---|
| FAME Content % | EN 14103:2011 | Report |

The biodiesel additive certification fuel must not contain DTBP or other additives; the applicant must submit data to CARB that demonstrates meeting this provision prior to test fuel approval. The same biodiesel additive certification fuel must be used for blending each of the candidate fuels for a certification test program.

(E) Diesel Test Fuels

The applicant shall report all of the properties specified under (a)(2)(E)1 and 2 of this appendix for each Diesel Test Fuel sent by each emissions test facility to the same independent laboratory.

1. The Reference CARB Diesel.

The Reference CARB Diesel used in the comparative testing described in (a)(2)(F) of this appendix shall be produced from straight-run California diesel fuel by a hydrodearomatization process and shall have the characteristics set forth below under "Reference CARB Diesel~~Fuel~~ Specifications" (the listed ASTM methods are incorporated herein by reference):

Table A.9: Reference ~~Fuel~~CARB Diesel Specifications

| **Property** | **Test Method** | **Fuel Specifications** |
|---|---|---|
| Sulfur Content | ASTM D5453-93 | 15 ppm maximum |
| Aromatic Hydrocarbon Content, Volume % (Each of 3 measurements) | ASTM D5186-03(2009) | 10.0 % maximum |
| Polycyclic Aromatic Content, Weight % (Each of 3 measurements) | ASTM D5186-03(2009) | 1.4 % maximum |
| Nitrogen Content | ASTM D4629-12 | 10 ppm maximum |
| Unadditized Cetane Number (Each of 3 measurements) | ASTM D613-14, ASTM D6890-13be1, ASTM D7170-14; or ASTM D7668-14a | 48.0 minimum |
| API Gravity | ASTM D287-12b | 33.0 – 39.0 |
| Viscosity at 40°C, cSt | ASTM D445-14e2 | 2.0 – 4.1 |

| | | |
|---|---|---|
| Flash Point, °F, minimum | ASTM D93-13e1 | 130 |
| Distillation, °F | ASTM D86-12 | |
| Initial Boiling Point | | 340 – 420 |
| 10 % Recovered | | 400 – 490 |
| 50 % Recovered | | 470 – 560 |
| 90 % Recovered | | 550 – 610 |
| End Point | | 580 – 660 |

The Reference CARB Diesel fuel must not contain biodiesel, DTBP, or other additives; the applicant must submit data to CARB that demonstrates meeting this provision prior to test fuel approval. The same Reference CARB Diesel must be used for blending each of the candidate fuels containing Reference CARB Diesel for a certification test program.

2. The Designated Equivalent Limits Diesel.

The Designated Equivalent Limits Diesel used in the comparative testing described in (a)(2)(F) of this appendix shall be a commercially available California diesel fuel or blend of commercially available California diesel fuels that does not contain biodiesel or DTBP and meets all of the specifications set forth in section 2282(h)(1). If the Designated Equivalent Limits Diesel is a blend, it shall be blended at the emissions test facility from products shipped directly to the independent laboratory from the product source facilities, and the blending shall be observed and verified by an independent, state-licensed professional engineer. Identification of product sources, certificates of analysis for the fuels, and verification of the blending shall be submitted with the proposed test protocol. Designated Equivalent Limits Diesel properties shall be analyzed in triplicate for triplicate demonstrations of compliance with the respective specifications.

(F) Emissions testing.

1. Exhaust emission tests using ~~the~~each candidate fuel and ~~the reference fuel~~each Diesel Test Fuel shall be conducted in accordance with the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles," as incorporated

by reference in CCR, title 13, section 1956.8(b). The tests shall be performed using ~~a Detroit Diesel Corporation Series 60 engine, through December 31, 2017, or a~~ 2004-2006 model-year, Cummins ISM370 engines having a nominal torque rating of 1450 ft-lb and a nominal power output of 360 to 380 hp, and produced between January 2004 and December 2006, inclusive, ~~starting January 1, 2015,~~ or, if the Executive Officer determines that the 2004-2006 Cummins ISM370 is no longer representative of the pre-2007 model-year, heavy duty diesel engine fleet, another engine model found by the Executive Officer to be representative of such engines. ~~A determination by the Executive Officer that an engine is no longer representative shall not affect the certification of a diesel fuel formulation based on prior tests using that engine pursuant to a protocol approved by the Executive Officer.~~

2. The comparative testing shall be conducted at two emissions test facilities, one using Reference CARB Diesel and one using both Reference CARB Diesel and Designated Equivalent Limits Diesel in separate tests. If the testing uses an engine as described in (a) below, the testing may occur at a single emissions test facility using Reference CARB Diesel and Designated Equivalent Limits Diesel. All testing must be observed by ~~a party or~~independent parties that are mutually agreed upon by the Executive Officer and the applicant. The testing at each test facility shall be observed by and verified by an independent, state-licensed professional engineer. The applicant shall be responsible for all costs of the comparative testing.

   a. Approval of a single engine for certification testing at a single emissions test facility: The Executive Officer may determine that any single, specific test engine located at a specific emissions test facility adequately represents California diesel engines for the purpose of certifying B20 additive or ADF formulations and is therefore considered approved for single engine certification testing. This part does not supersede any requirement other than the requirement to use two engines at two emissions test facilities. In order to make this determination, the requirements and criteria in i-iii or iv below must be met.

      i. Approval of test plan: The Executive Officer must first preapprove any test plan designed to

demonstrate the acceptability of specific single-engine certification testing rather than two-engine certification testing.

1. The test plan must identify each emissions test facility and each test engine and must include all of the test protocols for each emissions test facility and each test engine consistent with the requirements of section (a)(2)(A).

2. The test plan must include testing of the same Diesel Test Fuel and the same twenty-percent blend with Biodiesel Additive Certification Fuel in accordance with the requirements of this section (a)(2) at a minimum of three emissions test facilities.

3. For each test engine at each emissions test facility, testing shall be performed in the test sequence, D B20 B20 D D B20 B20 D, on each of five days of testing, where D is the Diesel Test Fuel and B20 is the blend with Biodiesel Additive Certification Fuel at twenty percent.

ii. Acceptability criteria of single engines for certification testing.

1. All data generated under each Executive-Officer-approved test plan must be submitted prior to Executive Officer consideration for approval of any applicable single-engine acceptability for certification testing or any applicable B20 ADF certification.

2. In determining the acceptability of single engines for certification testing, the Executive Officer may review and consider all applicable testing procedures and test-engine operating data, including test-cycle performance and specific emissions data.

3. The NOx emission criterion for acceptability of single-engine testing is as follows:

$$(100\%)[(\overline{X}_{B20}/\overline{X}_{D})\text{Engine 1} - (\overline{X}_{B20}/\overline{X}_{D})\text{Engine k}] \leq 1.00\%,$$

where $\overline{X}_{B20}$ and $\overline{X}_{D}$ are the average specific NOx emissions with the B20 test fuel and Diesel Test Fuel, respectively, Engine 1 is the engine with the largest relative increase in NOx emissions with the B20 test fuel compared to the Diesel Test Fuel and is deemed to be acceptable for single-engine B20 ADF certification testing, and Engine k is any of the other engines.

As determined by the Executive Officer, Engine 1 and each Engine k that meets the above criterion when tested in accordance with the requirements of this section (a)(2) is deemed to be acceptable for single-engine B20 ADF certification testing, unless the Executive Officer determines that the testing did not conform to the approved test plan or that specific test-engine operating data, such as test-cycle performance or specific emissions data, are anomalous.

iii. Additional criterion for certification of B20 ADF candidate fuel based on single engine testing. For single-engine B20 ADF certification testing, certification test results for each Diesel Test Fuel must meet the following additional criterion:

$$(100\%)[(\overline{X}_{C}/\overline{X}_{R})\text{Certification Testing} - (\overline{X}_{B20}/\overline{X}_{D})\text{Engine Acceptability Testing}] \leq 2.00\%,$$

where $\overline{X}_{C}$ and $\overline{X}_{R}$ are the average specific PM emissions from the engine with the B20 candidate fuel and Diesel Test Fuel, respectively, used in certification testing and

$\overline{X}_{B20}$, and $\overline{X}_{D}$ are the average specific PM emissions from the same engine with the B20 test fuel and Diesel Test Fuel, respectively, used in engine acceptability testing. The Executive Officer will determine approval of B20 ADF additive formulations and other formulations for certification based on all applicable emissions criteria, testing procedures, and test-engine operating data, including test-cycle performance and specific emissions data.

iv. Any specific single engine that is one of the two engines used for emissions testing resulting in a successful additive or ADF formulation certification, as evidenced by issuance of an Executive Order granted to that additive or ADF formulation, may be deemed by the Executive Officer to be acceptable for single engine testing. The criteria in iii above apply to that engine, based on the PM results generated from the additive or ADF formulation certification testing.

3. For each comparative test, t~~T~~he applicant shall use one of the following test sequences:

a. If both cold start and hot start exhaust emission tests are conducted, a minimum of five exhaust emission tests shall be performed on the engine with each fuel, using either of the following sequences, where "R" is the Reference CARB Diesel or the Designated Equivalent Limits Diesel and "C" is the candidate fuel: RC RC RC RC RC (and continuing in the same order) or RC CR RC CR RC (and continuing in the same order).

The engine mapping procedures and a conditioning transient cycle shall be conducted with the Reference CARB Diesel or the Designated Equivalent Limits Diesel before each cold start procedure using the Reference CARB Diesel or the Designated Equivalent Limits Diesel. The reference cycle used for the candidate fuel shall be the same cycle as that used for the fuel preceding it.

b. If only hot start exhaust emission tests are conducted, one of the following test sequences shall be used throughout the testing, where "R" is the Reference CARB Diesel or the Designated Equivalent Limits Diesel and "C" is the candidate fuel:

Alternative 1: RC CR RC CR (continuing in the same order for a given calendar day; a minimum of twenty individual exhaust emission tests must be completed with each fuel)

Alternative 2: RR CC RR CC (continuing in the same order for a given calendar day; a minimum of twenty individual exhaust emission tests must be completed with each fuel)

Alternative 3: RRR CCC RRR CCC (continuing in the same order for a given calendar day; a minimum of twenty-one individual exhaust emission tests must be completed with each fuel)

For all alternatives, an equal number of tests shall be conducted using the Reference CARB Diesel or the Designated Equivalent Limits Diesel and the candidate fuel on any given calendar day. At the beginning of each calendar day, the sequence of testing shall begin with the fuel that was tested at the end of the preceding day. The engine mapping procedures and a conditioning transient cycle shall be conducted after every fuel change and/or at the beginning of each day. The reference cycle generated from the Reference CARB Diesel or the Designated Equivalent Limits Diesel for the first test shall be used for all subsequent tests.

For alternatives 2 and 3, each paired or triplicate series of individual tests shall be averaged to obtain a single value which would be used in the calculations conducted pursuant to (a)(2~~3~~)(G) of this appendix.

4. The applicant shall submit ~~a~~ test schedules to the Executive Officer at least one week prior to commencement of the tests. The test schedules shall identify the days on which the tests will be conducted, and shall provide for conducting the tests consecutively

without substantial interruptions other than those resulting from the normal hours of operations at the test facility~~y~~ies. The Executive Officer shall be permitted to observe any tests. The party~~y~~ies conducting the testing shall maintain ~~a~~ test logs which identify~~y~~ies~~s~~ all tests conducted, all engine mapping procedures, all physical modifications to or operational tests of the engines, all recalibrations or other changes to the test instruments, and all interruptions between tests and the reason for each such interruption. The party~~y~~ies conducting the tests or the applicant shall notify the Executive Officer by telephone and in writing of any unscheduled interruption resulting in a test delay of 48 hours or more, and of the reason for such delay. Prior to restarting the test, the applicant or person conducting the tests shall provide the Executive Officer with a revised schedule for the remaining tests. All tests conducted in accordance with the test schedule, other than any tests rejected in accordance with an outlier identification and exclusion procedure included in the approved test protocol, shall be included in the comparison of emissions pursuant to (a)(2~~3~~)(G) of this appendix.

5. In each test of a fuel, exhaust emissions of oxides of nitrogen (NOx) and particulate matter (PM) shall be measured.

(G) Process for determining if the tested candidate fuel fulfils the requirements for certification: For each Diesel Test Fuel, t~~T~~he average emissions during testing with the candidate fuel shall be compared to the average emissions during testing with the ~~Reference CARB~~ Diesel Test Fuel, applying one-sided Student's t statistics as set forth in Snedecor and Cochran, *Statistical Methods* (7th ed.), page 91, Iowa State University Press, 1980, which is incorporated herein by reference. The Executive Officer shall issue a certification pursuant to this paragraph only if he or she makes all of the determinations set forth ~~in (a)(3)(G)~~ below for each test, after applying the criteria of (a)(2~~3~~)(G)5. of this appendix.

1. The average NOx emissions during testing with a candidate fuel that contains renewable hydrocarbon diesel demonstrate at least a two percent reduction relative to the average NOx emissions during testing with the Diesel Test Fuel.

2. The average NOx emissions during testing with a candidate fuel that does not contain renewable hydrocarbon diesel do not exceed the average NOx emissions during testing with the Diesel Test Fuel.

~~1.~~ 3. The average PM ~~individual~~ emissions ~~of NOx and PM, respectively,~~ during testing with the candidate fuel do not exceed the average PM ~~individual~~ emissions ~~of NOx and PM, respectively,~~ during testing with the ~~Reference CARB~~ Diesel Test Fuel.

~~2.~~ 4. Use of any additive identified pursuant to (a)(2)(B) of this appendix in heavy-duty engines will not increase emissions of noxious or toxic substances which would not be emitted by such engines operating without the additive. In addition, cellular tests on the particulate emissions from heavy-duty engines will not show greater harm for mutagenicity, inflammation, DNA damage, or oxidative stress with the use of any such additive than would occur with such engines operating without the additive.

~~3.~~ 5. In order for the determinations of (a)(2)(G) of this appendix to be made, for each referenced pollutant the candidate fuel shall satisfy the following relationship:

~~$$\overline{x}_c < \overline{x}_R + \delta - S_p \times \sqrt{\frac{2}{n}} \times t(a, 2n-2)$$~~

$$\overline{x}_c < Z \times \overline{x}_R + \delta - S_p \times \sqrt{\frac{2}{n}} \times t(a, 2n-2)$$

Where:

$\overline{x}_c$ = Average emissions during testing with the candidate fuel

Z = Offset factor equal to 1.0 for all referenced pollutants for all candidate fuels, except for NOx for candidate fuels containing renewable hydrocarbon diesel, for which the offset factor is equal to 0.98

$\overline{x}_R$ = Average emissions during testing with the ~~Reference CARB~~ Diesel Test Fuel

$\delta$ = Tolerance level equal to 1 percent of $\overline{x}_R$ NOx, 2 percent of $\overline{x}_R$ for PM

$S_p$ = Pooled standard deviation

t(a, 2n-2) = The one-sided upper percentage point of t distribution with a = 0.15 and 2n-2 degrees of freedom

n = Number of tests of candidate fuel and ~~Reference CARB~~ Diesel Test Fuel

(H) If the Executive Officer finds that the~~a~~ candidate fuels have~~s~~ been properly tested in accordance with (a)(2)(F) of this appendix, and makes the determinations specified in (a)(2)(G) of this appendix for each test of each Diesel Test Fuel, then he or she shall issue an Executive Order certifying the alternative diesel fuel or additive formulation represented by the candidate fuel. The Executive Order shall identify all of the characteristics of the candidate fuels determined pursuant to (a)(2)(C) of this appendix. The Executive Order shall provide that the certified alternative diesel fuel formulation has the following specifications: [1] a sulfur content, total aromatic hydrocarbon content, polycyclic aromatic hydrocarbon content, and nitrogen content not exceeding that of the candidate fuels, [2] a cetane number and API gravity not less than that of the candidate fuels, [3] any additional fuel specification required under (a)(2)(C) of this appendix, and [4] presence of all additives that were contained in the candidate fuels, in a concentration not less than in the candidate fuels~~, except for an additive demonstrated by the applicant to have the sole effect of increasing cetane number~~. Additionally, the Executive Order shall contain a table mirroring Table A.5 in this a~~A~~ppendix ~~1 (a)(1)(A)~~ listing the required concentration of additive at each 5 percent interval of blend level, if applicable. All such characteristics shall be determined in accordance with the test methods identified in (a)(2)(C) of this appendix. The Executive Order shall assign an identification name to the specific certified biodiesel fuel formulation.

(I) ~~In-use testing~~Modification or revocation of an Executive Order.

1. The Executive Officer may review and, for good cause, modify or revoke an Executive Order issued pursuant to this appendix. Good cause includes emissions testing showing that the certified additive or ADF formulation does not meet the emissions equivalence criteria under (a)(2)(G) of this appendix or failure to comply with any requirement of this appendix. The Executive Officer may not revoke or modify an Executive Order without affording the entity to whom the Executive Order was issued the opportunity to submit, within 20 days of notification of a determination that such good cause exists, any information that it wants the Executive Officer to consider. Within 50 days after making an initial determination of good cause, the Executive Officer shall make a final determination based on available information regarding whether or not emissions equivalence has been demonstrated pursuant to regulatory requirements, and whether any other requirement of this appendix has not been met, and finalize any appropriate revocation or modification. ~~If the executive officer determines that a commercially available biodiesel fuel blend meets all of the specifications of a certified biodiesel fuel formulation set forth in an Executive Order issued pursuant to (a)(2)(H) of this appendix, but does not meet the criteria of (a)(2)(G) of this appendix when tested in accordance with (a)(2)(F), the Executive Officer shall modify the Executive Order as is necessary to assure that biodiesel fuel blends sold commercially pursuant to the certification will meet the criteria set forth in (a)(2)(G).~~ ~~The m~~Modifications to the order may include additional specifications or conditions, or a provision making the order inapplicable to specified biodiesel fuel producers.

2. To revoke or modify a certified Executive Order, the Executive Officer will issue a notice of determination of cause to revoke or modify. Once the notice of determination is issued, the entity to whom the Executive Order was issued may be required to discontinue distribution of their certified additive or ADF formulation, and accordingly notify all companies to which they have provided the certified additive or ADF formulation in the last six months of CARB's notice of intent to revoke or modify. At any time, an entity to whom an Executive Order is issued pursuant to this appendix may request to

withdraw their Executive Order by providing written notice to the Executive Officer requesting such withdrawal.

~~The Executive Officer shall not modify a prior Executive Order without the consent of the applicant and of the producer of the commercially available biodiesel fuel blend found not to meet the criteria, unless the applicant and producer are first afforded an opportunity for a hearing in accordance with CCR, title 17, division 3, chapter 1, subchapter 1.25, article 2 (commencing with Section 60055.1). If the Executive Officer determines that a producer would be unable to comply with this regulation as a direct result of an order modification pursuant to this subsection, the Executive Officer may delay the effective date of such modification for such period of time as is necessary to permit the producer to come into compliance in the exercise of all reasonable diligence.~~

(J) As of August 1, 2021, only biodiesel additives and ADF formulations that are approved under section (a)(1) of this appendix or certified according to the certification procedures under section (a)(2) of this appendix that became effective [insert the effective date of this subarticle] can be used to comply with the in-use requirements under section 2293.6.

(b) [Reserved]