

Legal Disclaimer: This is an unofficial electronic version of the Alternative Diesel Fuels regulation. The official legal edition is available at the OAL website: <http://oal.ca.gov/publications/ccr/>

CALIFORNIA AIR RESOURCES BOARD

REGULATION ON COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS

Unofficial Electronic Version

Title 13, California Code of Regulations, Sections 2293 – 2293.9 and  
Appendix 1 of Subarticle 2

Legal Disclaimer: This is an unofficial electronic version of the Alternative Diesel Fuels regulation. The official legal edition is available at the OAL website:  
<http://oal.ca.gov/publications/ccr/>

## CALIFORNIA AIR RESOURCES BOARD

### REGULATION ON COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS

Unofficial Electronic Version

Title 13, California Code of Regulations, Sections 2293 – 2293.9 and Appendix 1

Effective May 3, 2021

#### LEGAL DISCLAIMER & USER'S NOTICE

This compilation of California Air Resources Board (CARB) specifications for alternative motor vehicle fuels, collectively referred to as the California Alternative Diesel Fuel (ADF) regulation, was produced by CARB staff for the reader's convenience. The preamble, hyperlinks, text and paragraph formatting, and Table of Contents contained in this document are for convenience only. This compilation is not meant to be a substitute for the actual text of the regulations. CARB is not responsible for any errors or omissions in the information provided, and reserves the right to make corrections without notice. The Office of Administrative Law (OAL) maintains the official California Code of Regulations, which is available in loose-leaf printed format from Thomson - West / Barclays (1-800-888-3600). An online version, which is maintained and updated weekly by OAL through a contract with Thomson - West / Barclays, may be found at [https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I9EFE102992764F38A312FCA8E745BB4B&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I9EFE102992764F38A312FCA8E745BB4B&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default))

The user assumes full responsibility for the files he/she uploads and/or downloads and/or views including data destroyed by viruses or other computer initiated problems. Neither CARB nor any of its respective employees warrant that the service will be uninterrupted or error free.

Title 13, California Code of Regulations, Division 3, Chapter 5 (Standards for Motor Vehicle Fuels), Article 3 (Specifications for Alternative Motor Vehicle Fuels) consists of three Subarticles. Subarticle 1 (starting with section 2290) contains specifications for alternative motor vehicle fuels. Subarticle 2 (starting with section 2293) contains the Commercialization of Alternative Diesel Fuels regulation that establish a comprehensive, multi-state process governing the commercialization of alternative diesel fuels (ADF) in California. Subarticle 3 contains ancillary provisions.

This compilation does not include sections 2292.1 (Fuels Specifications for M-100 Fuel Methanol), 2292.2 (Specifications for M-85 Fuel Methanol), 2292.3 (Specifications for E-100 Fuel Ethanol), 2292.4 (Specifications for E-85 Fuel Ethanol), 2292.5 (Specifications for Compressed Natural Gas), 2292.6 (Specifications for Liquefied Petroleum Gas, and 2292.7 (Specifications for Hydrogen), which continue to apply.

Legal Disclaimer: This is an unofficial electronic version of the Alternative Diesel Fuels regulation. The official legal edition is available at the OAL website: <http://oal.ca.gov/publications/ccr/>

The Authority and References, which appear at the end of each section, have also been excluded from this compilation to shorten this document for reader convenience.

## TABLE OF CONTENTS

### California Code of Regulations, Title 13, Division 3 Chapter 5. Standards for Motor Vehicle Fuels

#### Article 3. Specifications for Alternative Motor Vehicle Fuels

|                                                                                      |    |
|--------------------------------------------------------------------------------------|----|
| <b>SUBARTICLE 2. COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS</b> .....             | 5  |
| § 2293. Purpose. ....                                                                | 5  |
| § 2293.1. Basic Prohibitions. ....                                                   | 5  |
| § 2293.2. Definitions. ....                                                          | 5  |
| § 2293.3. Exemptions.....                                                            | 9  |
| § 2293.4. General Requirements Applicable to All ADFs. ....                          | 10 |
| § 2293.5. Phase-In Requirements.....                                                 | 10 |
| (a) Stage 1: Pilot Program.....                                                      | 10 |
| (b) Stage 2: Development of Fuel Specification. ....                                 | 16 |
| (c) Stage 3 Evaluation: Commercial Sales .....                                       | 22 |
| (d) Stage 3B: Commercial Sales Not Subject to In-use Requirements... ..              | 22 |
| § 2293.6. In-use Requirements for Specific ADFs to Stage 3A. ....                    | 23 |
| (a) Biodiesel Provisions for Blends of B20 and Below.....                            | 23 |
| § 2293.7. Specifications for Alternative Diesel Fuels. ....                          | 27 |
| (a) Specifications for Biodiesel.....                                                | 27 |
| § 2293.8. Reporting and Recordkeeping. ....                                          | 28 |
| (a) General Reporting Requirements.....                                              | 28 |
| (b) Stage Specific Reporting Requirements.....                                       | 28 |
| (c) Recordkeeping .....                                                              | 31 |
| § 2293.9. Severability.....                                                          | 33 |
| Appendix 1 of Subarticle 2. In-use Requirements for Pollutant Emissions Control..... | 35 |

## SUBARTICLE 2. COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS

### § 2293. Purpose.

The purpose of this regulation is to establish a comprehensive, multi-stage process governing the commercialization of alternative diesel fuels (ADF) in California, ranging from the initial limited sales of an ADF while it undergoes a screening evaluation; through expanded sales governed by enhanced monitoring, testing, and multimedia evaluations; and ending with full-scale commercial sales as warranted. This regulation is intended to foster the introduction and use of innovative ADFs in California while preserving or enhancing public health, the environment and the emissions benefits of the existing motor vehicle diesel fuel regulations.

### § 2293.1. Basic Prohibitions.

- (a) Starting January 1, 2016, no person shall sell, offer for sale or supply an ADF for use in California unless that person is in compliance with this subarticle and with the terms of any approved and current Executive Order issued under section 2293.5 that is applicable to the person or the ADF.
- (b) For the purposes of this subarticle, each retail sale of ADF for use in a motor vehicle and each supply of ADF into a motor vehicle fuel tank constitutes a separate sale or supply by each and every person who previously sold or supplied such ADF in violation of this subarticle.

### § 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:
  - (1) "Alternative diesel fuel" or "ADF" means any fuel used in a compression ignition engine that is not petroleum-based, does not consist solely of hydrocarbons, and is not subject to a specification under subarticle 1 of this article.
  - (2) "Biodiesel" means a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats that is 99-100 percent biodiesel by volume (B100 or B99) and meets the specifications set forth by ASTM International in the latest version of *Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels D6751* contained in the ASTM publication entitled: *Annual Book of ASTM Standards, Section 5*, as defined in CCR, title 4, section

4140(a).

- (3) "Biodiesel Blend" means biodiesel blended with CARB diesel.
- (4) "Blend Level" means the ratio of an ADF to the CARB diesel it is blended with, expressed as a percent by volume. The blend level may also be expressed as "AXX," where "A" represents the particular ADF and "XX" represents the percent by volume that ADF is present in the blend with CARB diesel (e.g., a 20 percent by volume biodiesel/CARB diesel blend is denoted as "B20").
- (5) "Blendstock" means a component that is either used alone or is blended with another component(s) to produce a finished fuel used in a motor vehicle. A blendstock that is used directly as a transportation fuel in a vehicle is considered a finished fuel.
- (6) "B5" means a biodiesel blend containing no more than five percent biodiesel by volume.
- (7) "B20" means a biodiesel blend containing more than five and no more than 20 percent biodiesel by volume.
- (8) "Candidate ADF" means a fuel that is in the Stage 1 or Stage 2 evaluation process in this subarticle.
- (9) "CARB Diesel" means a light or middle distillate fuel that may be comingled with up to five (5) volume percent biodiesel and meets the definition and requirements for "diesel fuel" or "California nonvehicular diesel fuel" as specified in CCR, title 13, division 3, chapter 5, article 2 (commencing with section 2281). "CARB diesel" may include: renewable hydrocarbon diesel; gas-to-liquid fuels; Fischer-Tropsch diesel; diesel fuel produced from renewable crude; CARB diesel blended with additives specifically formulated to reduce emissions of one or more criteria or toxic air contaminants relative to reference CARB diesel; and CARB diesel specifically formulated to reduce emissions of one or more criteria or toxic air contaminants relative to reference CARB diesel.
- (10) "Criteria Pollutant" means any air pollutant for which a California ambient air quality standard (CAAQS) or a national ambient air quality standard (NAAQS) has been established
- (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.
- (11) "Executive Officer" means the Executive Officer of the Air Resources Board, or his or her designee.
- (12) "Executive Order" or "EO" means a document signed by the Executive Officer or his or her designee under this subarticle that: a) provides an exemption from in-use requirements, b) approves a formulation under the certification procedures as an equivalent CARB diesel formulation, or c) specifies the stage under which a regulated party(ies) for an ADF or candidate ADF is or will be operating. An Executive Order includes any enforceable terms, conditions, and requirements that the regulated party(ies) must meet in order to sell, offer for sale, or supply that ADF or candidate ADF for use in California.
- (13) "Finished Fuel" means a fuel that is used directly in a vehicle for transportation purposes without requiring additional chemical or physical processing.
- (14) "Fuel Blender" means any person who blends an ADF with another fuel.
- (15) "Hydrocarbon" means any homogeneous mixture with elemental composition primarily of hydrogen and carbon that may contain residual impurities.
- (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.
- (16) "Importer" has the same meaning as defined in the Low Carbon Fuel Standard regulation at CCR, title 17, section 95481(a).
- (17) "Multimedia Evaluation" has the same meaning as defined in California Health and Safety Code section 43830.8(b).

- (18) “New Technology Diesel Engine” or “NTDE” means a diesel engine that meets at least one of the following criteria:
- (A) Meets 2010 ARB emission standards for on-road heavy duty diesel engines under section 1956.8.
  - (B) Meets Tier 4 emission standards for non-road compression ignition engines under sections 2421, 2423, 2424, 2425, 2425.1, 2426, and 2427.
  - (C) Is equipped with or employs a Diesel Emissions Control Strategy (DECS), verified by ARB pursuant to CCR, title 13, chapter 14 (commencing with section 2700), which uses selective catalytic reduction to control Oxides of Nitrogen (NOx).
- (19) “Offsetting Factors” means any factors in the commercial market that serve to offset the emissions of a pollutant from the use of an ADF. Offsetting factors may include, but are not limited to, the use of:
- (A) Specific vehicle technologies such as NTDEs that have been proven to reduce emissions of the pollutant;
  - (B) Fuels that reduce emissions of the pollutant; and
  - (C) Feedstocks that have been shown to reduce or eliminate increases in the pollutant.
- (20) “Person” has the same meaning as defined in California Health and Safety Code section 39047 and includes, but is not limited to, ADF producers, importers, marketers and blenders. “Person” includes the plural when two or more persons are subject to an executed Executive Order or an interim or final fuel specification issued pursuant to the requirements of this subarticle.
- (21) “Pollutant Control Level” means a blend level of an ADF above which per gallon in-use requirements have been established by regulation to ensure there will be no increases in one or more criteria pollutants when compared to emissions from Reference CARB Diesel.
- (22) “Potential Adverse Emissions Impacts” means for any given ADF or ADF blend, any criteria pollutant for which testing during a multimedia evaluation results in statistically significant increases of that criteria pollutant above an appropriate baseline for that ADF.



- (23) "Producer" has the same meaning as defined in the Low Carbon Fuel Standard regulation at CCR, title 17, section 94581(a).
- (24) "Reference CARB Diesel" means "reference fuel" as defined in section 2282(g)(3).
- (25) "Renewable hydrocarbon diesel" means a diesel fuel that is produced from nonpetroleum renewable resources but is not a mono-alky ester and which is registered as a motor vehicle fuel or fuel additive under 40 Code of Federal Regulations part 79.
- (26) "Toxic Air Contaminant" means any substance identified or designated by the Air Resources Board as a toxic air contaminant pursuant to California Health and Safety Code section 39657, or is designated as a hazardous air pollutant under section 112 of the federal Clean Air Act (42 U.S.C. § 7412).
- (27) "Trade Secret" has the same meaning as defined in California Government Code section 6254.7.

(b) List of Acronyms and Abbreviations

|              |                                                                                 |
|--------------|---------------------------------------------------------------------------------|
| AAQS         | Ambient Air Quality Standards                                                   |
| ADF          | Alternative Diesel Fuel or Fuels                                                |
| API          | American Petroleum Institute                                                    |
| ARB or Board | California Air Resources Board                                                  |
| ASTM         | ASTM International formerly known as American Society for Testing and Materials |
| CCR          | California Code of Regulations                                                  |
| CI           | Carbon Intensity                                                                |
| EO           | Executive Order                                                                 |
| EmFAC        | ARB's Emission (Em) Factors (FAC) Model                                         |
| FAME         | Fatty Acid Methyl Esters                                                        |
| GVWR         | Gross Vehicle Weight Rating                                                     |
| H&SC         | California Health and Safety Code                                               |
| LRT          | Low Carbon Fuel Standard Reporting Tool                                         |
| MMWG         | Multimedia Working Group                                                        |
| NOx          | Oxides of Nitrogen                                                              |
| NTDE         | New technology diesel engines                                                   |
| PM           | Particulate Matter                                                              |
| ppm          | Parts per Million                                                               |
| U.S. EPA     | U.S. Environmental Protection Agency                                            |

**§ 2293.3. Exemptions.**

This subarticle does not apply to any of the following, as specified:

- (a) Fuels that have a specification under CCR, title 13, division 3, chapter 5, article 3, subarticle 1 (commencing with section 2290);
- (b) CARB diesel blends comprised solely of CARB diesel and one or more diesel additives comprising in the aggregate no more than 1.0 percent by volume of the CARB diesel blend. This exemption does not apply to additives used pursuant to the in use requirements specified in Appendix 1.

#### **§ 2293.4. General Requirements Applicable to All ADFs.**

Starting January 1, 2016, any person who sells, offers for sale or supplies an ADF for use in motor vehicles in California must first meet the requirements in this subarticle and must also:

- (a) Have the ADF registered with U.S. EPA under 40 Code of Federal Regulations part 79.
- (b) Meet all applicable regulatory requirements of the California Department of Food and Agriculture (including, but not limited to, those in Cal. Code Regs., tit. 4, §§ 4140-4148, 4200, and 4202-4205).
- (c) Meet all other applicable local, State, and federal requirements.

#### **§ 2293.5. Phase-In Requirements.**

[Note: The goal of this comprehensive process is to foster the introduction of new, lower polluting ADF fuels by allowing the limited sales of innovative ADFs in stages while emissions, performance, and environmental impacts testing is conducted. This testing is intended to develop the necessary real-world information to quantify the environmental and human health benefits from using new ADFs, determine whether these fuels have adverse environmental impacts relative to conventional CARB diesel, and identify any vehicle/engine performance issues such fuels may have.]

An ADF that has not been approved for commercialized sales under subsection (c) for Stage 3A fuels or subsection (d) for Stage 3B fuels may only be sold, offered for sale, or supplied for use in motor vehicles in California pursuant to an approved Executive Order (EO) for candidate ADF issued under subsection (a) for a Stage 1 pilot program or under subsection (b) for a Stage 2 ADF.

- (a) Stage 1: Pilot Program.

[Note: The purpose of this stage is to allow limited, small fleet use of innovative fuels while requiring screening tests and assessments to quickly determine whether there will be unreasonable potential impacts on air quality, the environment and vehicular performance. Such data will help inform more extensive testing and analysis to be conducted in Stage 2. This Stage 1 is modeled after the existing ARB regulation that provides limited, fuel test program exemptions under 13 CCR 2259.]

(1) Stage 1 Application.

A person seeking a Stage 1 Executive Order (EO) for an ADF must submit an application to the Executive Officer that includes all the following information:

- (A) Expected program duration, not to exceed one year except as provided in section 2293.5(a)(4) below;
- (B) An estimate of the maximum number of vehicles or engines, engine certification levels, and vehicle types (e.g., urban bus, refuse hauler, line haul truck) involved in the program;
- (C) The estimated mileage duration per vehicle involved in this stage;
- (D) The quantity of fuel expected to be used in the pilot program, not to exceed the energy equivalent of one million gallons (approximately 35 million megajoules) of diesel fuel per year, per ADF total;
- (E) The site(s) in which the testing during this stage will be conducted (including the street address, city, county, and zip code);
- (F) The manner in which the distribution pumps will be labeled to ensure proper use of the test fuel and meet California's fuel labeling requirement in accordance with California Business and Professions Code, section 13480(a);
- (G) The name, address, telephone number, title of the person(s) and the name of the company or organization requesting entry into a Stage 1 pilot program; and
- (H) If different from the information in (G) above, the name, address, telephone number and title of the person(s) and the name of the company or organization responsible for recording and making

the information specified above available to the Executive Officer and the location in which such information will be maintained.

- (I) Chemical and physical properties of the candidate ADF: complete chemical speciation, Chemical Abstract Services (CAS) numbers (if available), density, energy content, vapor pressure, oxidative potential, distillation curve, log Kow (water-octanol partition coefficient), and Henry's law coefficient.
- (J) Environmental information about the ADF: Material Safety Data Sheet(s) (MSDS) for all components of the candidate ADF, production process diagram, identification of potential human health or environmental effects, lifecycle flow diagram (including all stages of the process-raw material extraction, manufacturing, distribution, use and disposal including all intervening transportation steps), and potential release scenarios during production (including by-products), transportation and use.
- (K) A statement whether the fuel will be blended with diesel, whether it can be used as a neat fuel, or whether it can be used either way.
- (L) Plan for commercialization under this regulation.
- (M) Emissions testing completed on criteria pollutants.
- (N) Attestation that the vehicles to be used in the pilot program are owned by the applicant or the applicant has received written consent from their owners.
- (O) The vehicle identification number (VIN) of each vehicle participating in the pilot program, if known.
- (P) Affirmative statement that the owner(s) of all vehicles to be used in the applicant's pilot program are aware of any possible warranty issues that may arise from the use of the candidate ADF or candidate ADF/CARB diesel blend in their engines.
- (Q) One of the following:
  - 1. A declaration that a fuel standard has been approved for the ADF pursuant to Chapter 14 of the Business and Professions Code (section 13400 et seq.); or if no such

standard exists,

2. A copy of the developmental fuel variance the applicant has submitted to the California Department of Food and Agriculture pursuant to Business and Professions Code section 13405, proof of its approval and a declaration that:
  - a. The requirements of Business and Professions Code sections 12001 – 13800 other than those pertaining to fuel quality, have been met, and
  - b. The California Department of Food and Agriculture received a copy of the application required to be submitted under 13 CCR §2293.5.
- (R) Proof that the candidate complies with the U.S. Environmental Protection Agency requirements at 40 Code of Federal Regulations part 79.
- (S) It is the responsibility of the applicant to identify any specific portion of the information submitted above as trade secret. Any such trade secret information identified by the applicant shall be treated pursuant to 17 CCR 91000 – 91022 and the California Public Records Act (Government Code section 6250 et seq.).
- (2) Stage 1 Application Completeness Determination.
  - (A) After receiving a pilot program application, the Executive Officer shall advise the applicant in writing within 30 business days either that the application is complete or that specified additional information is required to make it complete.
  - (B) After receiving the additional information required under (A), the Executive Officer shall advise the applicant in writing within 15 business days either that the application is complete or that specified additional information is still required to make it complete.
  - (C) If additional information is required and not received within 60 business days the application will be deemed incomplete.
- (3) Public Comment and Final Action on a Stage 1 Application.

- (A) After deeming an application complete, the Executive Officer shall post the application on ARB's internet web site for 30 business days for public comments. Only comments related to potential factual or methodological errors or the candidate ADF's impacts to public health or the environment may be considered by the Executive Officer. Within 30 business days, the applicant shall either make revisions to its application and submit those revisions to the Executive Officer, or submit a detailed written response to the Executive Officer explaining why no revisions are necessary.
- (B) Within 30 business days of receiving the applicant's response to the public comments under (A), the Executive Officer shall either approve or disapprove the pilot program. The Executive Officer shall notify the applicant of his/her decision in writing and provide, if the application is denied, the reasons for the denial.
- (C) The Executive Officer shall disapprove a proposed pilot program if he/she determines the use of the candidate ADF, under the terms and conditions of the pilot program as proposed, poses substantial risk to the community in which the pilot program is proposed to be conducted, presents risks that substantially outweigh the putative benefits of using the candidate ADF, or may cause a significant adverse impact on the environment.
- (D) No approval of a pilot program shall be effective without an approved Executive Order (EO) executed between the Executive Officer and the applicant(s). The EO shall include terms and conditions that the applicant must meet in order to provide the candidate ADF fuel in California during the term of the EO. The terms and conditions shall be based on the information specified in section 2293.5(a) above, as well as the following:
  - 1. Any additional information the Executive Officer determines is necessary to fill in data gaps that may have been identified during the application process;
  - 2. Additional toxicity and other testing the Executive Officer determines is necessary and appropriate to better characterize any substance in the candidate ADF;
  - 3. Evidence of substantial progress in working in good faith with the original equipment/engine manufacturers of the

engines involved in the EO, consensus standards organizations (e.g., ASTM), regulatory agencies, and other interested parties toward developing a consensus set of fuel specifications for the candidate ADF; and

4. The use of adequate controls to ensure appropriate fuel quality and performance in consideration of vehicle performance, impact on the environment and fuel production. Appropriate controls include but are not limited to the use of interim fuel specifications and consensus standards.

(4) Operation under a Stage 1 EO.

- (A) For the duration of the EO, the applicant must meet all the terms and conditions specified therein;
- (B) The Executive Officer may terminate or modify an EO, with 30 business days written notice to the applicant(s), for failure of the applicant(s) to comply with any of the terms and conditions of the EO, failure to comply with any other applicable provision in this subarticle, or for good cause. Good cause includes, but is not limited to, a determination by the Executive Officer that the information submitted in the application was inaccurate or incomplete or that the use of the ADF, under the terms and conditions of the approved pilot program, may pose an unacceptable risk to the community in which the pilot program is being conducted, or its risks substantially outweigh the putative benefits of using the candidate ADF;
- (C) The Executive Officer shall not revoke or modify an approved Stage 1 EO without first affording the applicant an opportunity for a hearing in accordance with CCR, title 17, division 3, chapter 1, subarticle 1.25, article 2 (commencing with Section 60055.1). The Executive Officer may temporarily suspend an EO without a hearing and prior to revocation or modification if the Executive Officer determines that continued operations under the EO may adversely affect human health;
- (D) In the event an applicant cannot complete an approved pilot program within the allotted time, the applicant(s) may request a six month extension, renewable up to three times; and
- (E) Upon successful completion of the pilot program, the applicant(s)

may submit an application for a Stage 2 EO, as specified in section 2293.5(b) below.

(b) Stage 2: Development of Fuel Specification.

[Note: The purpose of this stage is to allow limited but expanded fleet use of an ADF that has successfully undergone the Stage 1 pilot program. Stage 2 candidate ADFs undergo additional emissions and performance testing to better characterize potential impacts on air quality, the environment and vehicular performance. This testing and assessment will be conducted pursuant to a formal multimedia evaluation leading to the development of a fuel specification, as appropriate. Further, the multimedia evaluation will be the basis for determining whether the candidate ADF has potential adverse emissions impacts. The determination of potential adverse emissions impacts determines whether the candidate ADF can proceed to Stage 3A or Stage 3B.]

A person who has successfully completed a Stage 1 pilot program for a candidate ADF under subsection (a) may apply for a Stage 2 EO for that candidate ADF.

(1) Stage 2 Application.

An applicant for Stage 2 must submit an application to the Executive Officer that includes all the following information:

- (A) Planned duration for this stage, not to exceed one year, renewable up to four times or as otherwise provided in section 2293.5(b)(4);
- (B) An estimate of the maximum number of vehicles or engines, engine certification levels, and vehicle types (e.g., urban bus, refuse hauler, line haul truck) involved in this stage along with a description of the emissions control technology;
- (C) The estimated mileage duration per vehicle involved in this stage;
- (D) The quantity of the candidate ADF fuel expected to be used in this stage, not to exceed the energy equivalent of 30 million gallons of diesel fuel per year;
- (E) The site(s) in which the testing during this stage will be conducted (including the street address, city, county, and zip code);
- (F) Any changes or updates to the information submitted under



section 2293.5(a)(1)(F)—(R) to reflect the expanded scope of vehicles, locations, fuel volume, timeframe, and other aspects of operation under Stage 2. For each of these items, the applicant must specify whether there has been no change or update, or if there has been a change or update, what that change or update is; and

- (G) Identification of the test lab and principal investigator, including his/her curriculum vitae, who will be conducting the multimedia evaluation for the candidate ADF.
- (H) It is the responsibility of the applicant to identify any specific portion of the information submitted above as trade secret. Any such trade secret information identified by the applicant shall be treated pursuant to 17 CCR 91000 - 91022 and the California Public Records Act (Government Code section 6250 et seq.).

(2) Stage 2 Application Completeness Determination

- (A) After receiving a Stage 2 application, the Executive Officer shall advise the applicant in writing within 30 business days either that the application is complete or that specified additional information is required to make it complete;
- (B) After receiving the additional information required under (A), the Executive Officer shall advise the applicant in writing within 15 business days either that the application is now complete or that specified additional information is still required to make it complete.
- (C) If additional information is required and not received within 60 business days the application will be deemed incomplete.

(3) Public Comment and Final Action on a Stage 2 Application

- (A) After deeming an application complete, the Executive Officer shall post the application on ARB's internet web site for 30 business days for public comments. Only comments related to potential factual or methodological errors or information regarding vehicle performance or the candidate ADF's impacts to public health or the environment may be considered by the Executive Officer. Within 30 business days, the applicant shall either make revisions to its application and submit those revisions to the Executive Officer, or submit a detailed written response to

the Executive Officer explaining why no revisions are necessary;

- (B) Within 30 business days of receiving the applicant's response to the public comments under (A), the Executive Officer shall either approve or disapprove the Stage 2 application. The Executive Officer shall notify the applicant of his/her decision in writing and provide, if the application is denied, the reasons for the denial;
- (C) The Executive Officer shall disapprove a proposed pilot program if he/she determines the use of the ADF, under the terms and conditions of the Stage 2 program as proposed, poses a substantial risk to the community(ies) in which the program is proposed to be conducted, presents risks that substantially outweigh the putative benefits of using the ADF, or may cause a significant adverse impact on the environment;
- (D) No approval of a Stage 2 program shall be effective without an approved Executive Order (EO) executed between the Executive Officer and the applicant(s). The EO shall include terms and conditions that the applicant must meet in order to provide the ADF fuel in California during the term of the EO. The terms and conditions shall be based on the information specified in section 2293.5(b)(1) above, as well as the following:
  - 1. Any additional information requested in writing by the Executive Officer to fill in data gaps that may have been identified during the application process;
  - 2. Additional toxicity and other testing the Executive Officer determines is necessary and appropriate to better characterize any substance in the ADF;
  - 3. Substantial progress in working in good faith with the original equipment/engine manufacturers of the engines involved in the EO, consensus standards organizations (e.g., ASTM), regulatory agencies, and other interested parties toward developing a consensus set of fuel specifications for the ADF. These efforts must culminate in adoption of consensus standards by the end of the Stage 2 EO.

(4) Operation under a Stage 2 EO

- (A) For the duration of the EO, the applicant must meet all the terms and conditions specified therein;
  - (B) The Executive Officer may terminate or modify an EO, with 30 business days written notice to the applicant(s), for failure of the applicant(s) to comply with any of the terms and conditions of the EO, failure to comply with any other applicable provision in this subarticle, or for good cause. Good cause includes, but is not limited to, a determination by the Executive Officer that the information submitted in the application was inaccurate or incomplete or that the use of the ADF, under the terms and conditions of the approved Stage 2 program, may pose an unacceptable risk to the community in which the Stage 2 program is being conducted, or its risks substantially outweigh the putative benefits of using the ADF;
  - (C) In the event an applicant cannot complete an approved Stage 2 program within the allotted time, the applicant(s) may request a 1 year extension, renewable up to four times. The Executive Officer may provide additional extensions due to delays in completion of a multimedia evaluation, adoption of the applicable consensus standards, or for other good cause;
  - (D) Upon successful completion of the Stage 2 program, the applicant(s) may sell, offer for sale, or supply an ADF intended for use in motor vehicles in California pursuant to either Stage 3A or 3B, whichever applies, as specified in section 2293.5(c) or (d) below.
- (5) Multimedia Evaluation and Determination of Potential Adverse Impacts
- (A) All applicants with an approved stage 2 EO shall conduct a multimedia evaluation of the ADF that complies with Health and Safety Code section 43830.8 and all requirements of this subsection. Each applicant shall:
    - 1. Submit and obtain Executive Officer approval of a Tier I Report that provides all available background information on the fuel and identifies potential adverse impacts to public health or the environment, key risk assessment elements, and key knowledge gaps pertaining to impacts from the production, use, or disposal of the fuel;
    - 2. If one or more key knowledge gaps are identified in the

- Tier I Report, submit and obtain Executive Officer approval of a Tier II Report that provides the risk assessment design, including experimental test protocols and documents, to address the key knowledge gaps;
3. Complete the risk assessment and submit and obtain Executive Officer approval of a Tier III Report that includes the results of the assessment, an analysis of any significant adverse impacts on public health or the environment, and conclusions; and
  4. Provide any additional information or analysis that Executive Officer determines is necessary to address comments or concerns raised by the multimedia working group comprised of agencies described in Health and Safety Code section 43830.8(g), by peer reviewers asked to review the multimedia evaluation, or by the California Environmental Policy Council established pursuant to the Public Resources Code section 71017(b).
- (B) The multimedia evaluation shall identify and evaluate any significant adverse impact on public health or the environment, including air, water, or soil, that may result from the production, use, or disposal of the ADF, under Stage 2, Stage 3A, or Stage 3B, relative to an appropriate baseline identified by the Executive Officer in consultation with the multimedia working group. The evaluation shall address all impacts listed in Health and Safety Code section 42830.8(c); any other impacts specified by the Executive Officer; and any additional impacts identified during preparation of Tier I, Tier II, or Tier III reports.
- (C) In addition to determining any significant impacts, the multimedia assessment shall also include an evaluation of potential strategies that may reduce or eliminate each of the significant impacts identified;
- (D) If the findings from the multimedia evaluation show a statistically significant increase in any criteria, toxic, or other air pollutant from the use of an ADF in a motor vehicle, compared to the baseline, the Executive Officer shall determine whether there is a level below which the use of a candidate ADF or a candidate ADF blend would avoid a detrimental impact on ambient air quality.

(6) Completion of Stage 2

An applicant operating under a Stage 2 EO may qualify for commercial sales of the ADF under section 2293.5(c) for Stage 3A or section 2293.5(d) for Stage 3B if the Executive Officer determines in writing that the applicant has successfully completed the requirements of Stage 2.

(A) To successfully complete Stage 2, the applicant must meet all the following requirements;

1. Comply with all requirements specified in the approved Stage 2 EO;
2. Adopt consensus standards applicable to the ADF;
3. Obtain approval of at least 75 percent of compression ignition engine original equipment manufacturers for which the ADF is expected or intended to be used. Such approval must represent approval of the ADF blend levels expected or intended to be used in those engines;
4. Identify appropriate fuel specifications or in-use requirements for the ADF identified as part of the multimedia evaluation conducted according to the provisions of this article;
5. Upon request, provide additional information or data necessary for ARB to review the potential environmental effects of Stage 3A or 3B commercial sales that may be required under the California Environmental Quality Act (Public Resources Code section 21000 et seq.) or other laws; and
6. Obtain a written determination by the Executive Officer that all the above requirements have been met.

(B) In the event the Executive Officer makes a determination of potential adverse emissions impacts under section 2293.5(b)(5)(D), the Executive Officer shall post notice on the ARB website of his/her intent to initiate an evaluation to determine whether the use of a candidate ADF or candidate ADF blend would lead to adverse emissions impacts considering the existence of offsetting factors, and if such impacts are found, develop and establish

appropriate fuel specifications and/or in-use requirements to be added to section 2293.6 or 2293.7, as appropriate.

(c) Stage 3 Evaluation: Commercial Sales

In the event the Executive Officer has determined that a candidate ADF or candidate ADF blend has potential adverse emissions impacts, the Executive Officer shall direct ARB staff to conduct an evaluation to consider the effects of offsetting factors and the resultant impact that the use of the candidate ADF will have on criteria, toxic, or other air pollutants and resultant effect on air quality.

- (1) If the Executive Officer determines that no adverse emissions impact will occur as a result of the use of a candidate ADF or candidate ADF blend when considering offsetting factors, the candidate ADF or ADF blend shall then be subject to the provisions of Stage 3B in section 2293.5(d).
- (2) If the Executive Officer finds that after considering offsetting factors, the use of a candidate ADF or candidate ADF blend would result in adverse emissions impacts, then the fuel must be considered under Stage 3A. In that case, the Executive Officer shall determine conditions of ADF use including, but not limited to, appropriate fuel specifications and/or in-use requirements to preclude adverse emission impacts. Conditions of use may consider, but are not limited to, the effect of ADF feedstocks, the region of ADF use, or any seasonal effects relative to emissions impacts on air quality mandates.
- (3) If the Executive Officer finds appropriate fuel specifications and/or in-use requirements that would eliminate or reduce the adverse air quality impacts found in 2293.5(c)(2), then the Executive Officer will direct staff to initiate a rulemaking process to establish those standards under this subarticle.

(d) Stage 3B: Commercial Sales Not Subject to In-use Requirements

If the Executive Officer has determined that there are no potential adverse emissions impacts in accordance with 2293.5(b)(5)(D), or that there would be no adverse emissions impacts in accordance with 2293.5(c)(1) for a candidate ADF or candidate ADF blend, no in-use requirements are required for the fuel. The applicant may apply to the Executive Officer, and the Executive Officer may approve, a Stage 3B EO for commercial sales of the ADF or the ADF blend without amendment of this subarticle. Stage 3B activities are subject to the reporting and recordkeeping provisions specified in section 2293.8 and any conditions or limitations that the Executive Officer includes in the Stage 3B EO to ensure commercial sales meet any applicable standards and avoid any significant impact

to public health or the environment.

**§ 2293.6. In-use Requirements for Specific ADFs to Stage 3A.**

The following in-use requirements apply to the specified ADFs that are sold, offered for sale, supplied for use in California, or produced in or imported into California:

(a) Biodiesel Provisions for Blends of B20 and Below

This section includes specific provisions applicable to the use of biodiesel in the State.

(1) Phase-in period for biodiesel

- (A) Starting January 1, 2016, any person who produces, imports, blends, sells, or offers for sale or supply any biodiesel or biodiesel blends, shall be subject to the reporting requirements of Stage 3A, pursuant to 2293.8.
- (B) Starting January 1, 2018 any person who produces, imports, blends, sells, or offers for sale or supply any biodiesel or biodiesel blends in California, shall be subject to pollutant control levels under section 2293.6(a)(2).

(2) Pollutant Control Level

Table A.1 below shows fuel quality requirements for biodiesel blends depending on feedstock saturation and time of year. Biodiesel blends above the pollutant control level for NOx emissions are required to employ one of the in-use requirements for biodiesel listed in Appendix 1 of this subarticle.

Table A.1. Pollutant Control Level for NOx

| Feedstock Saturation | Time of Year    | NOx Control Level                |
|----------------------|-----------------|----------------------------------|
| Low Saturation       | Apr 1 to Oct 31 | B5, 5 volume percent biodiesel   |
|                      | Nov 1 to Mar 31 | B10, 10 volume percent biodiesel |
| High Saturation      | Jan 1 to Dec 31 | B10, 10 volume percent biodiesel |

(3) Biodiesel saturation level:

Table A.2 below shows the requirements for determination of saturation level for biodiesel feedstocks. The following documents are hereby incorporated by reference:

- (A) ASTM D613-14, "Standard Test Method for Cetane Number of Diesel Fuel Oil (2014)."
- (B) ASTM D6890-13be1, "Standard Test Method for Determination of Ignition Delay and Derived Cetane Number (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber (2013)."
- (C) ASTM D7170-14, "Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils—Fixed Range Injection Period, Constant Volume Combustion Chamber Method (2014)."
- (D) ASTM D7668-14a, "Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils—Ignition Delay and Combustion Delay Using a Constant Volume Combustion Chamber Method (2014)."

Table A.2. Biodiesel Saturation Level

| <b>Biodiesel Saturation Level</b> | <b>Unadditized Cetane Number</b> | <b>Test Method</b>                                               |
|-----------------------------------|----------------------------------|------------------------------------------------------------------|
| Low Saturation                    | <56                              | ASTM D613-14; ASTM D6890-13be1; ASTM D7170-14; or ASTM D7668-14a |
| High Saturation                   | ≥56                              | ASTM D613-14; ASTM D6890-13be1; ASTM D7170-14; or ASTM D7668-14a |

(4) Sunset of Biodiesel In-use Requirements

- (A) For on-road applications, NOx control requirements under 2293.6(a)(2) for biodiesel blends up to B20 will no longer be in effect when the vehicle miles travelled (VMT) by heavy-duty on- road diesel NTDEs in California reaches 90 percent of total VMT by the California heavy-duty on-road diesel vehicle fleet. The portion of VMT by on-road diesel vehicles in California represented by NTDEs will be determined using the most current CARB mobile source emission inventory and any



related tools.

- (B) When the conditions in 2293.6(a)(4)(A), the Executive Officer will issue an Executive Order certifying that the provisions of section 2293.6(a)(2) are no longer in effect for biodiesel used in on-road applications. The Executive Order will be posted on the CARB website.
  - (C) For off-road applications, NO<sub>x</sub> control requirements under 2293.6(a)(2) for biodiesel blends up to B20 will no longer be in effect when the hours of operation by heavy-duty off-road diesel NTDEs in California reaches 90 percent of the total hours of operation by the California heavy-duty off-road diesel engine fleet. The portion of total hours of operation by off-road diesel engines in California represented by NTDEs will be determined using the most current CARB mobile source emission inventory and related tools.
  - (D) When the conditions in 2293.6(a)(4)(C) occur, the Executive Officer will issue an Executive Order certifying that the provisions of section 2293.6(a)(2) are no longer in effect for biodiesel used in off- road applications. The Executive Order will be posted on the CARB website.
- (5) Exemption from In-Use Requirements
- (A) Fleet Exemption

The Executive Officer shall grant a fleet an exemption from the requirements of section 2293.6(a)(2) if the fleet owner or operator can demonstrate that at least 90 percent of the fleet consists of a combination of light and medium duty vehicles and heavy duty vehicles with NTDEs, as calculated pursuant to section 2293.6(a)(5)(A)2, and that any biodiesel above the pollutant control level will only be used in the exempted fleet. The application must provide sufficient documentation to demonstrate that the fleet meets all requirements for the fleet exemption. At a minimum, the applicant must provide documentation to demonstrate each of the following:

1. The fleet fueling facility has a centralized, secure fueling area, or uses another secure method of fueling.
2. The fleet consists of at least 90 percent in aggregate of

light and medium duty diesel vehicles (GVWR  $\leq 14,500$ lbs) and heavy duty diesel vehicles equipped with NTDEs. The aggregation shall be weighted according to each vehicle's rated maximum horsepower.

3. The fleet fueling facility has procedures or protocols in place to reasonably preclude fueling of vehicles that were not included in the aggregate calculation in section 2293.6(a)(5)(A)2.

(B) Retail Fueling Station Exemption

The Executive Officer shall grant a retail fueling station an exemption from the requirements of section 2293.6(a)(2) if the retail fueling station owner can demonstrate that at least 90 percent of all sales at the station of biodiesel blends above the pollutant control level, are to a combination of light and medium duty vehicles (GVWR  $\leq 14,500$ lbs) and heavy duty vehicles with NTDEs. The applicant must provide sufficient information, including data, surveys, or other proof, to demonstrate that the station meets all requirements for the retail fueling station exemption.

(C) In order for an exemption to be granted, the applicant must submit an application containing the following:

1. The name, title, address and telephone number of the person(s) requesting an exemption from whom further information may be requested;
2. Whether the application is for an exemption for a fleet, or a retail fueling station; and
3. The additional information and demonstrations required under section 2293.6(a)(5)(A) and (B).

(D) Within 20 business days after receipt of an application, the Executive Officer shall advise the applicant in writing either that the application 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 that the information submitted makes the application complete or that specified additional information is still required to make the application

complete. Within 20 business days after an application has been deemed complete, the Executive Officer shall grant or deny an application.

- (E) The Executive Officer shall grant an exemption if the Executive Officer determines the applicant has satisfied all requirements of section 2293.6(a)(5), while considering the impact on air quality. The Executive Officer may request any additional information reasonably necessary to determine the applicant's eligibility for an exemption. The exemption shall be granted in the form of an executive order which shall automatically terminate effective upon a sunset of the in-use requirements, in accordance with section 2293.6(a)(4). The executive order shall contain such terms and conditions that the Executive Officer believes are needed to ensure the exempted activities continue to meet the requirements of this section 2293.6(a)(5), including but not limited to a requirement for periodic updates on the composition of fleets under an exemption. Failure to comply with all terms and conditions in an executive order are grounds for the Executive Officer to revoke the exemption.

(6) In-Use Requirement Program Review

- (A) On or before December 31, 2019, ARB staff will conduct a program review of biodiesel in-use requirements to determine the efficacy of in-use requirements under section 2293.6(a)(2). In conducting the program review, staff will consider the effects of offsetting factors, in addition to any other factors that may affect NOx emissions stemming from biodiesel use in motor vehicles.

**§ 2293.7. Specifications for Alternative Diesel Fuels.**

The following minimum specifications apply to the specified ADFs that are sold, offered for sale, supplied for use in California:

- (a) Specifications for Biodiesel.
  - (1) Biodiesel Blendstock or Neat Fuel (B100).
    - (A) The following documents are hereby incorporated by reference:
      1. ASTM D287-12b, "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method) (2012)."

2. ASTM D5453-93, "Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Motor Fuels and Oils by Ultraviolet Fluorescence (1993)."

Table A.3. Fuel Specifications for B100 Blendstock

| Property                  | Value           | Test Method                                                      |
|---------------------------|-----------------|------------------------------------------------------------------|
| Unadditized Cetane Number | ≥47             | ASTM D613-14, ASTM C6890-13be1, ASTM D7170-14; or ASTM D7668-14a |
| API Gravity               | ≥27 degrees API | ASTM D287-12b                                                    |
| Sulfur                    | ≤15 ppm         | ASTM D5453-93                                                    |

- (2) Biodiesel Blends. The fuel specifications promulgated by the California Department of Food and Agriculture in 4 CCR sections 4140-4148, 4200, and 4202-4205 shall apply to any biodiesel blend.

**§2293.8. Reporting and Recordkeeping.**

(a) General Reporting Requirements

- (1) Reporting periods are as follows: January 1 through March 31; April 1 through June 30; July 1 through September 30; and October 1 through December 31. Reports must be submitted to the Executive Officer by the end of the subsequent reporting period.
- (2) Reports must include the following information: year, reporting period, company name, address, contact name, phone, and email.

(b) Stage Specific Reporting Requirements

- (3) For Stages 1 and 2

A person operating under a Stage 1 or Stage 2 EO must submit quarterly reports to the Executive Officer throughout the term of the EO. Each report shall include the following:

- (A) The volume of ADF and ADF blend offered, supplied, or sold during each month by facility;
- (B) Any information specified under the terms of the EO;
- (C) Progress made toward completing the terms of the EO;

- (D) Any changes or updates to information submitted during the application process regarding the beneficial or adverse impacts of the ADF in California.

(4) For Stage 3A

Quarterly reports must be submitted to the Executive Officer by producers, importers, and blenders for fuels under Stage 3A. Each report shall include the following:

(A) Producers

1. Monthly volume of neat ADF produced by feedstock and supplied to California by facility;
2. Monthly volume of neat ADF sold, the date of sale, and the following purchaser information: company name, contact name, and contact information; and
3. Monthly volume of neat ADF used at the production facility to make a blended ADF, if applicable. Producers that also blend ADFs must also fulfill the blender reporting requirements in subdivision (C).

(B) Importers

1. Monthly volume of neat ADF and ADF blend by feedstock or source, if known, imported into California;
2. Monthly volume of neat ADF and ADF blend sold, the date of sale, and the following purchaser information: company name, contact name, and contact information;
3. Monthly volume of neat ADF used by the importer to make a blended ADF, if applicable. Importers that also blend ADFs must also fulfill the blender reporting requirements in subdivision (C); and
4. Additional biodiesel specific reporting requirement: On or after January 1, 2018, monthly volume of biodiesel blends up to B20 imported into California by feedstock or source in accordance with in-use requirements in Appendix 1 of this Article including method of NOx control.

(C) Blenders

1. Monthly volume of neat ADF purchased or obtained by feedstock and the following supplier information: company name, contact name, and contact information; Monthly volume of blended fuel and the blend level produced;
2. The volume of ADF blend offered, supplied, or sold during each month;
3. Additional biodiesel specific reporting requirements on or after January 1, 2018:
  - a. Monthly volume, blend level, method of NOx control, and transaction date for biodiesel sold with NOx control in accordance with the in-use requirements in Appendix 1 of this Article and the following purchaser information: company name, contact name, and contact information; and
  - b. Monthly volume, blend level, and transaction date for biodiesel sold without NOx control in accordance with the in-use requirements in Appendix 1 of this Article, and the following purchaser information: company name, contact name, and contact information.

(5) For Stage 3B

Quarterly reports must be submitted to the Executive Officer by producers, importers, and blenders for fuels under Stage 3B. The required information may be submitted to ARB through the Low Carbon Fuel Standards Reporting Tool (LRT) to fulfill this requirement. The producer, importer, or blender must provide notice to ARB of their intent to use the LRT prior to report submittal. Each report shall include the following:

- (A) The volume of ADF blendstock sold, supplied, or offered for sale in California during each quarter;
- (B) The volume of ADF neat fuel, if applicable; and
- (C) The volume of ADF/CARB diesel blend, if applicable.

(c) Recordkeeping

(6) General Recordkeeping Requirements

- (A) Records must be made available to ARB or its designee within 15 business days of any request for the records; and Quarterly reports and all substantiating documentation must be maintained for the term specified in the stage-specific requirements in section 2293.8(c)(2) and (3), below.

(7) For Stages 1,2, and 3B

A person operating under a Stage 1, Stage 2, or Stage 3B EO must maintain records for a minimum of two years including quarterly reports, substantiating documentation, and the following:

- (A) Product transfer documentation including volume sold, if applicable;
- (B) Transaction invoices provided to downstream customers, including direct sales to fleets, if applicable; and
- (C) Any information specified under the terms of the EO.

(8) For Stages 3A

- (A) Producers shall maintain records for a minimum of 5 years, including quarterly reports, substantiating documentation, and the following:
1. Product transfer documentation of neat ADF including volume sold and CI pathway;
  2. Transaction invoices provided to downstream customers, including direct sales to fleets; and
  3. Additional biodiesel specific reporting requirements:
    - a. Volume of biodiesel or biodiesel blends sold under exemption from in-use requirements pursuant to 2293.6(a)(5);
    - b. Test records that the fuel meets the

specifications defined in section 2293.7; and

- c. On or after January 1, 2018, monthly volume of B100 that has been produced or supplied to California in accordance with in-use requirements in Appendix 1 of this Article including method of NOx control.
- (B) Importers shall maintain records for a minimum of 5 years, including quarterly reports, substantiating documentation, and the following:
1. Product transfer documentation for neat ADF and ADF blends including volume sold and CI pathway;
  2. Transaction invoices provided to downstream customers, including direct sales to fleets; and
  3. Additional biodiesel specific reporting requirements:
    - a. Volume of biodiesel or biodiesel blends sold under exemption from in-use requirements pursuant to 2293.6(a)(5); and
    - b. On or after January 1, 2018, monthly volume of B100 or biodiesel blends imported into California by source in accordance with in-use requirements in Appendix 1 of this Article including method of NOx control.
- (C) Blenders shall maintain records for a minimum of 5 years including quarterly reports, substantiating documentation, and the following:
1. Product transfer documentation for ADF blends including volume sold, CI pathway;
  2. Transaction invoices provided to downstream customers, including direct sales to fleets; and
  3. Additional biodiesel specific reporting requirements:
    - a. Volume of each biodiesel blend level recorded as either high saturation or low saturation; any mix of both high and low saturation will be recorded as



- low saturation;
  - b. Volume of B5 blend level including any blend between B1 to B5;
  - c. On or after January 1, 2018, monthly volume, blend level, method of NOx control, and transaction date for biodiesel sold with NOx control and without NOx control in accordance with the in-use requirements in Appendix 1 of this Article and the following purchaser information: company name, contact name, and contact information; and
  - d. On or after January 1, 2018, statements on invoices indicating NOx control for each transaction of B100 or biodiesel blend as described in Appendix 1.
- (D) Distributors shall maintain records for a minimum of 5 years including:
- 1. Product transfer documentation which indicates volume sold, CI pathway,
  - 2. Additional biodiesel specific reporting requirements on or after January 1, 2018: Statements on invoices indicating that B100 or biodiesel blend contains NOx control and the type of NOx control, as described in Appendix 1.
- (E) Retailers shall maintain records for a minimum of 5 years including:
- 1. Product transfer documentation which indicates volume sold, CI pathway; and
  - 2. Additional biodiesel specific reporting requirements:
    - a. Copy of any exemptions provided pursuant to section 2293.6(a)(5); and
    - b. On or after January 1, 2018: Statements on invoices indicating that B100 or biodiesel blend contains NOx control and the type of NOx control, as described in Appendix 1.

**§2293.9. Severability.**

Legal Disclaimer: This is an unofficial electronic version of the Alternative Diesel Fuels regulation. The official legal edition is available at the OAL website: <http://oal.ca.gov/publications/ccr/>

Each part of this subarticle shall be deemed severable, and in the event that any part of this subarticle is held to be invalid, the remainder of this subarticle shall continue in full force and effect.

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

A person subject to the Stage 3A in-use requirements (section 2293.6) 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, 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) 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 identities and attestations of independence of the entities 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 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 biodiesel additive certification fuel and

- Diesel Test Fuels satisfy the specifications identified in (a)(2)(D) and (a)(2)(E) of this appendix;
- d. Reasonably adequate quality assurance and quality control procedures;
  - 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 NO<sub>x</sub> 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. 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 each complete test log prepared in accordance with (a)(2)(F) of this appendix, demonstrations that the candidate fuels meet 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)(C) of this appendix for 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 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 the certification fuel without the additive, and 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 each candidate fuel. 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 Executive Officer determines that 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 Fuel Properties

| 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                                                    |
| 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 Additive Certification Fuel.

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 Certification Fuel Properties

| 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 D6890-13be1, 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 Specifications" (the listed ASTM methods are incorporated herein by reference):

Table A.9: Reference 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 each candidate fuel and 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 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, 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.
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 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:

$$(100\%)[(\bar{x}_{B20}/\bar{x}_D)_{\text{Engine 1}} - (\bar{x}_{B20}/\bar{x}_D)_{\text{Engine k}}] \leq 1.00\%,$$

where  $\bar{x}_{B20}$  and  $\bar{x}_D$  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:

$$(100\%)[(\bar{x}_C/\bar{x}_R)\text{Certification Testing} - (\bar{x}_{B20}/\bar{x}_D)\text{Engine Acceptability Testing}] \leq 2.00\%$$

where  $\bar{x}_C$  and  $\bar{x}_R$  are the average specific PM emissions from the engine with the B20 candidate fuel and Diesel Test Fuel, respectively, used in certification testing and  $\bar{x}_{B20}$ , and  $\bar{x}_D$  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, the 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)(G) of this appendix.

4. The applicant shall submit 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 facilities. The Executive Officer shall be permitted to observe any tests. The parties conducting the testing shall maintain test logs which identify 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 parties 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)(G) of this appendix.

5. In each test of a fuel, exhaust emissions of oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM) shall be measured.
- (G) Process for determining if the tested candidate fuel fulfills the requirements for certification: For each Diesel Test Fuel, the average emissions during testing with the candidate fuel shall be compared to the average emissions during testing with the 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 below for each test, after applying the criteria of (a)(2)(G)5. of this appendix.
1. The average NO<sub>x</sub> emissions during testing with a candidate fuel that contains renewable hydrocarbon diesel demonstrate at least a two percent reduction relative to the average NO<sub>x</sub> emissions during testing with the Diesel Test Fuel.
  2. The average NO<sub>x</sub> emissions during testing with a candidate fuel that does not contain renewable hydrocarbon diesel do not exceed the average NO<sub>x</sub> emissions during testing with the Diesel Test Fuel.
  3. The average PM emissions during testing with the candidate fuel do not exceed the average PM emissions during testing with the Diesel Test Fuel.
  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.

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:

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

Where:

|                |                                                                                                                                                                                                            |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\bar{x}_c$ =  | 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 |
| $\bar{x}_R$ =  | Average emissions during testing with the Diesel Test Fuel                                                                                                                                                 |
| $\delta$ =     | Tolerance level equal to 1 percent of $\bar{x}_R$ NOx, 2 percent of $\bar{x}_R$ 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 Diesel Test Fuel                                                                                                                                                     |

- (H) If the Executive Officer finds that the candidate fuels have 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. Additionally the Executive Order shall contain a table mirroring Table A.5 in this appendix 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.

(l) 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. 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.

- (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 May 3, 2021, can be used to comply with the in-use requirements under section 2293.6.

(b) [Reserved]

### **Subarticle 3. Ancillary Provisions**

#### **§2294. Equivalent Test Methods.**

Whenever this article requires the use of a specified test method, another test method may be used following a determination by the Executive Officer that the other test method produces results equivalent to the results obtained with the specified method.

**§2295. Exemptions for Alternative Motor Vehicle Fuel Used in Test Programs.**

The Executive Officer shall consider and grant test program exemptions from the requirements of this Article in accordance with section 2259.