California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

July 25, 2013

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814
http://www.calepa.ca.gov/EPAbldg/location.htm

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
(This facility is accessible to persons with disabilities.)

TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO: http://www.arb.ca.gov/lispub/comm/bclist.php

July 25, 2013
9:00 a.m.

DISCUSSION ITEMS:

Note: The following agenda items may be heard in a different order at the Board meeting.

Agenda Item #

13-7-2: Public Hearing to Consider Amendments to Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities and Cargo Tanks

Staff will present to the Board proposed amendments to certification and test procedures for vapor recovery equipment used on cargo tanks and at gasoline dispensing facilities. The proposed amendments will address technical deficiencies with current test procedures and will reduce the regulatory burden on cargo tank operators but will not impose any new performance standards or specifications. In addition, the presentation will provide an overview of the scope of benefits of the current vapor recovery program, as well as describe potential improvements to the program and additional rulemaking under consideration.

13-7-3: Public Hearing to Consider the Adoption of the Regulatory Proposal to Determine and Control Evaporative Emissions From Off-Highway Recreational Vehicles

Staff will present to the Board a proposal for controlling evaporative emissions from off-highway recreational vehicles. Off-highway recreational vehicles include off-road motorcycles, all-terrain vehicles, sand cars, and specialty vehicles. The proposal sets a 1 gram/day total organic gas diurnal emissions standard that will significantly reduce evaporative emissions from these vehicles, especially during storing periods.

13-7-5: Public Meeting to Consider the Approval of the Proposed Assembly Bill 118 Air Quality Improvement Program Funding Plan for Fiscal Year 2013-14

Staff will present to the Board the Proposed Air Quality Improvement Program (AQIP) Funding Plan for Fiscal Year 2013-14, which provides staff's recommendations for allocating up to $35 million identified in the Governor's proposed Budget for AQIP. AQIP, created under Assembly Bill 118 (2007), provides incentive funding through 2015 for clean vehicle and equipment projects. Staff recommends directing most of the AQIP funding to continue *incentives for the purchase of zero-emission passenger cars and new hybrid and zero-emission trucks and buses. A portion of funding would also be allocated to advanced technology demonstration projects and a loan guarantee program for on-road trucks. To provide greater flexibility, a small portion of funding will not be initially allocated so that funding can be assigned to projects as important needs are identified.*

13-7-6: Public Meeting to Consider Adoption of Proposition 1B Program Funding Awards From Fiscal Year 2013-14 (Year 4) Funds to Reduce Emissions From Goods Movement and Updates to the Program Guidelines for Implementation

Staff will present to the Board for consideration a list of grant awards for local agency projects based on monies received from the Spring 2013 bond sale and any additional funds received in 2013 to reduce freight-related emissions in the four priority trade corridors.

CLOSED SESSION

The Board will hold a closed session, as authorized by Government Code section 11126(e), to confer with, and receive advice from, its legal counsel regarding the following pending or potential litigation, and as authorized by Government Code section 11126(a):

POET, LLC, et al. v. Goldstene, et al., Superior Court of California (Fresno County), Case No. 09CECG04850; plaintiffs' appeal, California Court of Appeal, Fifth District No. F064045.

Rocky Mountain Farmers Union, et al. v. Goldstene, U.S. District Court (E.D. Cal. Fresno), Case No. 1:09–CV–02234–LJO–DLB; interlocutory appeal, U.S. Court of Appeal, Ninth Circuit Nos. 09-CV-02234 and 10-CV-00163.

American Fuels and Petrochemical Manufacturing Associations, et al. v. Goldstene, et al., U.S. District Court (E.D. Cal. Fresno), Case No. 1:10-CV-00163-AWI-GSA; interlocutory appeal, U.S. Court of Appeal, Ninth Circuit, Case Nos. 09-CV-02234 and 10-CV-00163.

Association of Irritated Residents, et al. v. United States Environmental Protection Agency, 2011 WL 310357 (C.A.9), (Feb. 2, 2011).

California Dump Truck Owners Association v. California Air Resources Board, U.S. District Court (E.D. Cal. Sacramento), Case No. 2:11-CV-00384-MCE-GGH; plaintiffs' appeal, U.S. Court of Appeals, Ninth Circuit, Case No. 13-15175.

California Construction Trucking Association v. United States Environmental Protection Agency, U.S. Court of Appeals, Ninth Circuit, Case No. 13-70562.

Engine Manufacturers Association v. California Air Resources Board, Sacramento Superior Court, Case No. 34-2010-00082774.

Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board, San Francisco Superior Court, Case No. CGC-12-519554, plaintiffs' appeal, California Court of Appeal, First District, No. A138830.

California Chamber of Commerce et al. v. California Air Resources Board, Sacramento Superior Court, Case 34-2012-80001313.

Morning Star Packing Company, et al. v. California Air Resources Board, et al., Sacramento Superior Court, Case No. 34-2013-800001464.

Delta Construction Company, et al. v. United States Environmental Protection Agency, U.S. Court of Appeals, District of Columbia Circuit, Case No. 11-1428.

City of Los Angeles through Department of Water and Power v. California Air Resources Board, et al., Los Angeles Superior Court, Case No. BS140620.

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of three minutes to ensure that everyone has a chance to speak.

TO ELECTRONICALLY SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO:

http://www.arb.ca.gov/lispub/comm/bclist.php

(Note: not all agenda items are available for electronic submittals of written comments.)

ONLINE SIGN-UP:
You can sign up online in advance to speak at the Board meeting when you submit an electronic Board item comment. For more information go to:

http://www.arb.ca.gov/board/online-signup.htm

(Note: not all agenda items are available for online sign-up.)

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:
1001 I Street, 23rd Floor, Sacramento, California 95814
(916) 322-5594
ARB Homepage: www.arb.ca.gov

SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

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Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia
- Documentos disponibles en un formato alterno u otro idioma
- Una acomodación razonable relacionados con una incapacidad

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envié un fax a (916) 322-3928 lo más pronto posible, pero no menos de 7 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

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INDEX

July 25, 2013

Agenda #		Pages
13-7-2	Public Hearing to Consider Amendments to Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities and Cargo Tanks	1-270
13-7-3	Public Hearing to Consider the Adoption of the Regulatory Proposal to Determine and Control Evaporative Emissions From Off-Highway Recreational Vehicles	271-576
13-7-5	Public Meeting to Consider the Proposed Assembly Bill 118: Air Quality Improvement Program Funding Plan for Fiscal Year 2013-14	577-634
13-7-6	Public Meeting to Consider Adoption of Proposition 1B Grants to Reduce Emissions From Goods Movement	635-640

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO CERTIFICATION AND TEST PROCEDURES FOR VAPOR RECOVERY SYSTEMS AT GASOLINE DISPENSING FACILITIES (GDFs) AND CARGO TANKS

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adoption of amendments to Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities (GDFs) and Cargo Tanks.

DATE: July 25, 2013

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item may be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., July 25, 2013, and may continue at 8:30 a.m., on July 26, 2013. This item may not be considered until July 26, 2013. Please consult the agenda for the hearing, which will be available at least 10 days before July 25, 2013, to determine the day on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW PURSUANT TO GOVERNMENT CODE 11346.5(a)(3)

Sections Affected: Proposed amendment to California Code of Regulations, title 17, sections 94011, 94014, and 94016.

Documents Incorporated by Reference:

The Following Documents are Incorporated by Reference:

1. TP-201.1 - "Volumetric Efficiency for Phase I Systems" (Adopted: April 12, 1996 and last amended: July 26, 2012)
2. CP-204 - "Certification Procedure for Vapor Recovery Procedure for Vapor Recovery Systems for Cargo Tanks" (Adopted: April 12, 1996 and last amended: March 17, 1999)
3. TP-204.1 - "Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks" (Adopted: April 12, 1996 and last amended: March 17, 1999)
4. TP-204.2 - "Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks" (Adopted: April 12, 1996 and last amended: March 17, 1999)

5. TP-204.3 - "Determination of Leak(s)" (Adopted: April 12, 1996 and last amended: March 17, 1999)
6. TP-206.2 - "Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks" (Adopted: May 2, 2008)

Background:
In California, gasoline vapor emissions are controlled during the transfer of gasoline from storage tanks at terminals or bulk plants to tanker trucks, from tanker trucks to storage tanks at gasoline dispensing facilities (GDFs), and from GDF tanks to the vehicle's fuel tank during vehicle fueling. The ARB and the air pollution control/air quality management districts (air districts) share implementation of the vapor recovery program. ARB staff certifies prototype vapor recovery systems installed at operating station test sites. State law requires that throughout California only ARB-certified systems be offered for sale, sold, and installed. Air district staff inspects and tests the vapor recovery system upon installation during the permit process and conducts regular inspections to check that systems are operating as certified. ARB has also adopted regulations establishing procedures for certifying vapor recovery equipment installed on cargo tanks and procedures for testing and certifying that equipment annually.

ARB is now proposing to make minor amendments to several of the current vapor recovery certification and test procedures.

Objectives and Benefits:
The proposed amendments to certification and test procedures will:

1. Improve two test procedures used by ARB staff during certification of vapor recovery equipment designed for use with aboveground storage tanks (ASTs). Amendments to these test procedures will address technical deficiencies that staff has encountered during field testing, and will allow staff to make use of improved test equipment that is now available. Minor reorganization of, and amendment to these test procedures will also improve clarity and readability.

2. Revise the certification procedure and three test procedures for equipment used on cargo tanks to control gasoline vapor emissions. Revisions to these certification procedures would no longer require cargo tank vapor recovery equipment to be certified by ARB. However, cargo tank owners/operators will still be required to meet annual testing requirements. Test procedures are being revised to be more consistent with federal Department of Transportation requirements.

CONSISTENCY AND COMPATIBILITY WITH EXISTING STATE REGULATIONS

The proposed amendments are neither inconsistent nor incompatible with existing state regulations.

COMPARABLE FEDERAL REGULATIONS

For GDFs, there are no federal regulations that are directly comparable to California's EVR program. However, federal regulations do require certain jurisdictions not in attainment with air quality standards to adopt control measures that will help bring them into attainment. Some other states mandate the installation of vapor recovery systems at gasoline dispensing facilities, and changes to ARB Enhanced Vapor Recovery (EVR) certification requirements may have a national and international impact.

For cargo tanks, federal standards comparable to California's Cargo Tank Vapor Recovery Certification Program standards can be found in 40 CFR Part 63 Subpart R - National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations). Due to the severe and unique air pollution problems facing California, ARB test procedures are more stringent than comparable federal standards.

AVAILABILITY OF DOCUMENTS

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: *Initial Statement of Reasons for Rulemaking Amendments to Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities (Service Stations) and Cargo Tanks.*

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, on June 5, 2013.

Final Statement of Reasons Availability

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on ARB's website listed below.

AGENCY CONTACT PERSONS

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Mr. Scott Bacon at (916) 322-8949, or Mr. George Lew at (916) 327-0900. Further, the agency representative and designated back-up contact persons, to whom non-substantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011, or Ms. Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

Internet Access
This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on ARB's website for this rulemaking at http://www.arb.ca.gov/regact/2013/cargo2013/cargo2013.htm

DISCLOSURES REGARDING THE PROPOSED REGULATION

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Fiscal Impact/ Local Mandate

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action would not create costs or savings to any State agency or in federal funding to the State, costs or mandate to any local agency or school district, whether or not reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

COST IMPACTS ON REPRESENTATIVE PRIVATE PERSONS OR BUSINESSES

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The ARB is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESS, INCLUDING ABILITY TO COMPETE

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

STATEMENT OF THE RESULTS OF THE ECONOMIC IMPACT ASSESSMENT PREPARED PURSUANT TO GOVERNMENT CODE SEC. 11346.3(b)

Effect on Jobs/Businesses:

The Executive Officer has determined that the proposed regulatory action would not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

Benefits of the Proposed Regulation:

Revision of these vapor recovery test procedures will provide greater clarity to inspectors conducting these tests, provide for consistency with federal Department of Transportation requirements, benefit Cargo Tank operators who must meet these requirements.

EFFECT ON SMALL BUSINESS

The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action would not affect small businesses because the proposal is administrative in nature and does not impose any new requirements on individuals who own, operate, or work with vapor recovery systems.

HOUSING COST

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

ALTERNATIVES

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, or would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

ENVIRONMENTAL ANALYSIS

In accordance with ARB's certified regulatory program, California Code of Regulations, title 17, sections 60006 through 60007, and the California Environmental Quality Act, Public Resources Code section 21080.5, ARB has conducted an analysis of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulatory action. The environmental analysis of the proposed regulatory action can be found in Section IV of the Initial statement of Reasons.

SUBMITTAL OF COMMENTS AND WRITTEN COMMENT PERIOD

Interested members of the public may present comments orally or in writing at the meeting and may provide comments by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on June 10, 2013. To be considered by the Board, written comments not physically submitted at the meeting, must be submitted on or after June 10, 2013, and received no later than 12:00 noon on July 24, 2013, and must be addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the hearing so that ARB staff and Board members have additional time to consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted in Health and Safety Code, sections 25290.1.2, 39600, 39601, 39607, 41954 and 41962. This action is proposed to implement, interpret, and make specific sections 25290.1.2, 39515, 39516, 39605, 39607, 41952, 41954, 41956.1, 41959, 41960, 41960.2 and 41962.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non-substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action; in such event, the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15-days before it is adopted.

The public may request a copy of the modified regulatory text from ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990.

SPECIAL ACCOMMODATION REQUEST

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CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: May 28, 2013

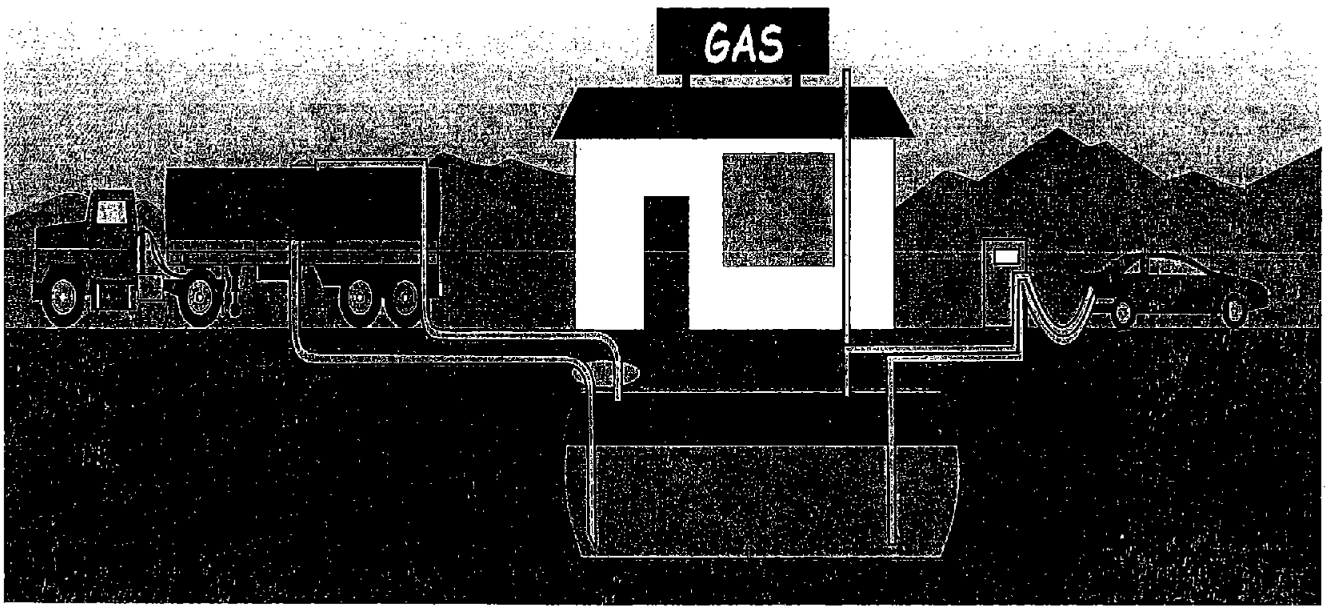
The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.

California Environmental Protection Agency

Air Resources Board

HEARING NOTICE AND STAFF REPORT

INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING,
AMENDMENTS TO CERTIFICATION AND TEST PROCEDURES
FOR VAPOR RECOVERY SYSTEMS
AT GASOLINE DISPENSING FACILITIES (GDFs)
AND CARGO TANKS



Date of Release: June 5, 2013
Scheduled for Consideration: July 25, 2013

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO CERTIFICATION AND TEST PROCEDURES FOR VAPOR RECOVERY SYSTEMS AT GASOLINE DISPENSING FACILITIES (GDFs) AND CARGO TANKS

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adoption of amendments to Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities (GDFs) and Cargo Tanks.

DATE:	July 25, 2013
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PLACE:	California Environmental Protection Agency Air Resources Board Byron Sher Auditorium 1001 I Street Sacramento, California 95814

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INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW PURSUANT TO GOVERNMENT CODE 11346.5(a)(3)

Sections Affected: Proposed amendment to California Code of Regulations, title 17, sections 94011, 94014, and 94016.

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AGENCY CONTACT PERSONS

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Mr. Scott Bacon at (916) 322-8949, or Mr. George Lew at (916) 327-0900. Further, the agency representative and designated back-up contact persons, to whom non-substantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011, or Ms. Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

Internet Access
This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on ARB's website for this rulemaking at http://www.arb.ca.gov/regact/2013/cargo2013/cargo2013.htm

DISCLOSURES REGARDING THE PROPOSED REGULATION

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Fiscal Impact/ Local Mandate

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action would not create costs or savings to any State agency or in federal funding to the State, costs or mandate to any local agency or school district, whether or not reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

COST IMPACTS ON REPRESENTATIVE PRIVATE PERSONS OR BUSINESSES

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The ARB is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESS, INCLUDING ABILITY TO COMPETE

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

STATEMENT OF THE RESULTS OF THE ECONOMIC IMPACT ASSESSMENT PREPARED PURSUANT TO GOVERNMENT CODE SEC. 11346.3(b)

Effect on Jobs/Businesses:

The Executive Officer has determined that the proposed regulatory action would not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

Benefits of the Proposed Regulation:

Revision of these vapor recovery test procedures will provide greater clarity to inspectors conducting these tests, provide for consistency with federal Department of Transportation requirements, benefit Cargo Tank operators who must meet these requirements.

EFFECT ON SMALL BUSINESS

The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action would not affect small businesses because the proposal is administrative in nature and does not impose any new requirements on individuals who own, operate, or work with vapor recovery systems.

HOUSING COST

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

ALTERNATIVES

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, or would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

ENVIRONMENTAL ANALYSIS

In accordance with ARB's certified regulatory program, California Code of Regulations, title 17, sections 60006 through 60007, and the California Environmental Quality Act, Public Resources Code section 21080.5, ARB has conducted an analysis of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulatory action. The environmental analysis of the proposed regulatory action can be found in Section IV of the Initial statement of Reasons.

SUBMITTAL OF COMMENTS AND WRITTEN COMMENT PERIOD

Interested members of the public may present comments orally or in writing at the meeting and may provide comments by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on June 10, 2013. To be considered by the Board, written comments not physically submitted at the meeting, must be submitted on or after June 10, 2013, and received no later than 12:00 noon on July 24, 2013, and must be addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the hearing so that ARB staff and Board members have additional time to consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted in Health and Safety Code, sections 25290.1.2, 39600, 39601, 39607, 41954 and 41962. This action is proposed to implement, interpret, and make specific sections 25290.1.2, 39515, 39516, 39605, 39607, 41952, 41954, 41956.1, 41959, 41960, 41960.2 and 41962.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non-substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action; in such event, the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15-days before it is adopted.

The public may request a copy of the modified regulatory text from ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language; or
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

/s/

Richard W. Corey
Executive Officer

Date: May 28, 2013

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

PUBLIC HEARING TO CONSIDER THE PROPOSED ADOPTION OF THE AMENDMENTS TO CERTIFICATION AND TEST PROCEDURES FOR VAPOR RECOVERY SYSTEMS AT GASOLINE DISPENSING FACILITIES (GDFs) AND CARGO TANKS

Date of Release: June 5, 2013

Scheduled for Consideration: July 25, 2013

Location: California Environmental Protection Agency (Cal-EPA)
Headquarters Building
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, CA 95814

Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

EXECUTIVE SUMMARY i
I INTRODUCTION AND BACKGROUND 1
A) VAPOR RECOVERY PROGRAM OVERVIEW 1
B) CARGO TANKS AND ENHANCED VAPOR RECOVERY RULEMAKING HISTORY 2
1) Cargo Tanks 2
2) Enhanced Vapor Recovery 3
C) LEGAL AUTHORITY 4
1) State Law 4
2) Federal Requirements 5
D) APPLICABILITY OF PROPOSED REGULATIONS 5
E) PUBLIC PROCESS 6
1) Web Site 6
2) Public Workshops 6
F) STATE IMPLEMENTATION PLAN 6
G) CLIMATE CHANGE CONSIDERATIONS 7
II DESCRIPTION OF THE PROBLEM THAT THIS PROPOSAL ADDRESSES; PROPOSED SOLUTION AND SUPPORTING RATIONALE 7
A) REVISIONS TO TP-201.1 7
B) REVISIONS TO TP-206.2 8
C) DELETION AND REPLACEMENT OF CP-204 8
D) REVISIONS TO TP-204.1 9
E) REVISIONS TO TP-204.2 9
F) REVISIONS TO TP-204.3 10
III SUMMARY OF RECOMMENDED BOARD ACTION 10
IV ENVIRONMENTAL IMPACTS ANALYSIS (CEQA Analysis) 10
A) Introduction 10
B) Environmental Review Process 11
C) Prior Environmental Analysis 11
D) Proposed Regulation 12
E) Environmental Impacts 12
V ENVIRONMENTAL JUSTICE 13
VI ECONOMIC IMPACTS 13
A) FISCAL IMPACTS 14
1) Impacts on California Businesses and Job Creation 14
2) Costs to State and Local Agencies 14
3) Economic Impacts of Alternatives 14
VII ALTERNATIVES CONSIDERED 14
A) Revisions to TP-201.1 15
B) Revisions to TP-206.2 15
C) Deletion and Replacement of CP-204 16
D) Revisions to TP-204.1 16
VIII SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION 17
A) Introduction 17
B) Revisions to TP-201.1 17
C) Revisions to TP-206.2 18

E) Deletion and Replacement of CP-204 23
F) Revisions to TP-204.1 25
G) Revisions to TP-204.2 28
H) Revisions to TP-204.3 31
IX MAJOR ISSUES IDENTIFIED AND DISCUSSED 33
X APPENDICES 34

A) Proposed Regulation Order to Adopt Amended Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities and Cargo Tanks

B) Regulatory Authority: Vapor Recovery Health and Safety Code Statutes

C) Proposed Amendments to TP-201.1: Volumetric Efficiency for Phase I Systems

D) Proposed Amendments to TP-206.2: Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks

E) Proposed Amendments to CP-204: Certification Procedure for Vapor Recovery Systems of Cargo Tanks

F) Proposed Amendments to TP-204.1: Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

G) Proposed Amendments to TP-204.2: Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

H) Proposed Amendments to TP-204.3: Determination of Leak(s)

I) Appropriateness of Test Procedure TP-201.1, "Volumetric Efficiency for Phase I Systems," on Gasoline Dispensing Facilities Equipped with Aboveground Storage Tanks

J) Public Process for Development of the Proposed Amendments

EXECUTIVE SUMMARY

In March 2000, the Air Resources Board (ARB or Board) approved the Enhanced Vapor Recovery (EVR) regulations for gasoline dispensing facilities (GDFs) equipped with underground storage tanks. In May 2007, ARB approved the EVR regulations for GDFs equipped with aboveground storage tanks (ASTs). The EVR regulations established new standards for vapor recovery systems to reduce emissions during storage and transfer of gasoline at GDFs. Control of emissions of air pollutants from GDFs is necessary to reduce hydrocarbon emissions that lead to the formation of ozone and to control emissions of benzene, a constituent of gasoline vapor that has been identified as a toxic air contaminant.

The EVR standards apply to both new and pre-existing GDFs. Phase-in of EVR standards started in 2001 for GDFs with underground storage tanks (USTs). For GDFs equipped with ASTs, phase-in of EVR standards began in 2009 and will continue beyond 2013. The EVR regulations were updated in 2001, 2002, 2004, 2006, 2007, and 2011. Previous updates were necessary to improve test procedures for vapor recovery system certifications, and to modify performance standards or implementation dates to reflect issues associated with evolving technology.

On April 18, 1977, the Board first approved performance standards for controlling emissions from cargo tanks used to transfer gasoline from loading terminals and bulk plants to GDFs. Since 1977, the cargo tank requirements have been amended several times, the last amendment occurring in 1999. Each amendment clarified the requirements and improved the process for ARB certification of equipment used on cargo tanks for the control of gasoline vapors. Similar to EVR on GDFs, control of gasoline vapors emitted from cargo tanks is necessary to reduce emissions of hydrocarbon and benzene, a toxic air contaminant.

Staff is now proposing additional regulatory amendments that will have no emissions, environmental, or economic impacts, but will:

1. Improve two test procedures used by ARB staff during certification of vapor recovery equipment designed for use with ASTs. Amendments to these test procedures will address technical deficiencies that staff has encountered during field testing, and will allow staff to make use of improved test equipment that is now available. Minor reorganization of, and amendment to these test procedures will also improve clarity and readability.

2. Revise the certification procedure and three test procedures for equipment used on cargo tanks to control gasoline vapor emissions. Revisions to these certification procedures will no longer require cargo tank vapor recovery equipment to be certified by ARB. However, cargo tank owners/operators will still be required to meet annual testing requirements. Test procedures are being

updated and revised to allow the use of a federal test method, with a few California-specific changes, for annual compliance testing.

Recommendation: Staff recommends that the Board adopt amendments to the California Code of Regulations (Appendix A) that incorporate by reference the proposed amendments to certification procedures and test procedures (Appendices C, D, E, F, G, and H). There are no emissions, environmental, or economic impacts associated with the proposed amendments. By taking this action, the Board would:

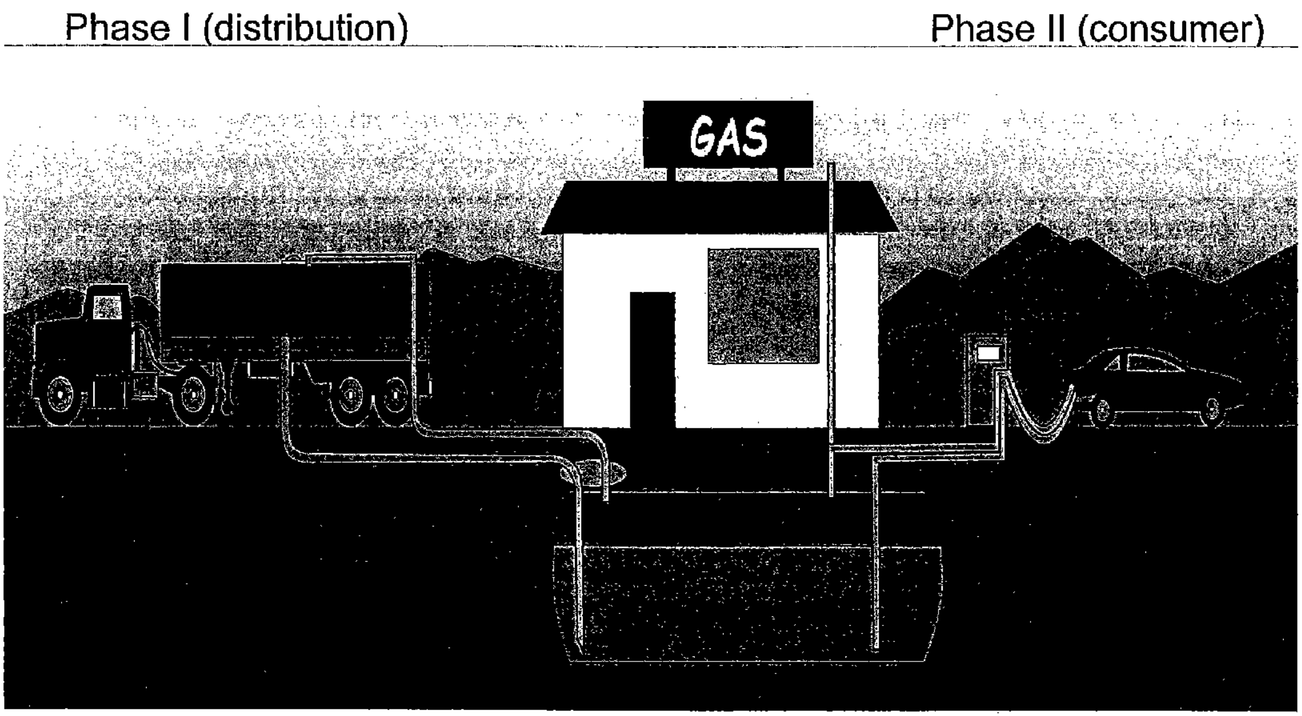
1. Resolve technical problems that currently exist with two test procedures used by ARB staff when certifying vapor recovery equipment for aboveground storage tanks; and
2. Reconcile cargo tank certification and test procedures with current industry practices, and provide additional flexibility for cargo tank owners to remain in compliance with performance standards.

I INTRODUCTION AND BACKGROUND

A) Vapor Recovery Program Overview

In California, gasoline vapor emissions are controlled during the transfer of gasoline from storage tanks at terminals or bulk plants to tanker trucks (called cargo tanks) that transport gasoline to dispensing facilities (GDFs or service stations), at which gasoline is transferred into vehicles. Cargo tanks are tested annually to ensure that they do not exceed an allowable leak rate. At GDFs, there are two types of gasoline transfers. Phase I vapor recovery collects vapors during bulk fuel distribution, when a tanker truck fills the service station storage tank. The gasoline vapor displaced from filling these storage tanks is transferred to the tanker trucks. The gasoline vapor inside the tanker truck is recovered at the terminal when a new load of gasoline fills the tanker. Phase II vapor recovery collects vapors during vehicle refueling by the gasoline consumer. The vapor recovery collection efficiency during both of these transfers is determined through certification of vapor recovery systems. In-station diagnostics (ISD) provides real-time monitoring of critical vapor recovery system components and alerts the station operator/owner of any vapor recovery system failures so that corrective action can be taken.

Figure I-1
Phase I and Phase II Vapor Recovery Systems at Service Stations



The ARB and the air pollution control/air quality management districts (air districts) share responsibility for implementation of California's vapor recovery program. ARB staff certifies prototype Phase I and Phase II vapor recovery systems installed at operating station test sites. State law in the Health and Safety Code section 41954 requires that throughout California only ARB-certified systems be offered for sale, sold, and installed. Air district staff inspects and tests the certified vapor recovery systems upon installation during the permit process and conducts regular inspections to check that systems are operating as certified.

ARB has adopted regulations establishing procedures for certifying vapor recovery equipment installed on cargo tanks and procedures for testing and certifying that equipment annually. Cargo tanks are tested by independent testing contractors. Test results are submitted to ARB for review. For each cargo tank that passes required testing, ARB annually issues a non-transferable and non-removable decal which is placed on the cargo tank in a location that can be readily seen. Storage tank operators at terminals or bulk plants will not transfer gasoline to cargo tanks with an invalid decal or after the expiration date listed on the decal. Air districts are prohibited from adopting cargo tank performance standards more stringent than those adopted by ARB, but can inspect and test cargo tanks to verify compliance with ARB requirements.

The vapor recovery requirements affect a multitude of stakeholders. These include the vapor recovery equipment manufacturers, gasoline marketers who purchase this equipment, cargo tank owners/operators, contractors who install, maintain, and test vapor recovery systems, and air districts who enforce vapor recovery rules. In addition, California certified systems are required by some other states and countries.

B) Cargo Tanks and Enhanced Vapor Recovery Rulemaking History

1) Cargo Tanks

On April 18, 1977, ARB adopted the first cargo tank vapor recovery certification regulations. These regulations established a five minute static pressure test with an allowable leak rate to prevent excessive gasoline vapor emissions during the transfer of gasoline from the bulk plant or terminal to the cargo tank, the transport of gasoline by the cargo tank, and the transfer of gasoline from the cargo tank to the GDF. This test requires an empty cargo tank. The regulations also required the certification of cargo tank vapor recovery equipment and annual certification of each cargo tank which expired on June 30 of each year. The certified equipment must be compatible with vapor recovery systems installed at bulk plants, terminals, and GDFs. Owners or operators of cargo tanks must submit the result of the five minute static pressure test and other information each year in order to get certified by the State Fire Marshall, acting on behalf of ARB.

On February 24, 1984, ARB adopted changes to the cargo tank certification program by allowing an annual rolling expiration date rather than a fixed date of June 30 for each year, requiring a decal from the California Highway Patrol rather than from the State Fire Marshal, and requiring that annual testing be conducted 60 days prior to expiration rather than six months.

On June 28, 1995, the Board approved three major changes to the cargo tank certification program. First, the release of gasoline vapors into the air is prohibited when cargo tanks are filled with gasoline or when preparing cargo tanks for annual testing. Second, the allowable pressure drops for the annual static pressure test (five minute test) were reduced by a minimum of 50 percent. Cargo tanks were reported to comply with new pressure drop requirements for the previous ten years. Third, a new cargo tank test procedure (one minute) was added. The one minute test can be conducted with gasoline in cargo tanks. This new test allowed ARB and districts to conduct compliance testing without requiring the emptying of cargo tanks.

On August 27, 1998, the Board approved amendments which provided an exemption for cargo tanks used to refuel aircraft, since such cargo tanks are not driven on a public road and are not filled at a bulk plant or terminal where the vapors can be recovered.

2) Enhanced Vapor Recovery

In March 2000, with the Board's approval of the Enhanced Vapor Recovery (EVR) regulations, new, more effective standards for vapor recovery systems were set to reduce emissions during the storage and transfer of gasoline at GDFs equipped with underground storage tanks.

On October 25, 2001, the Board approved amendments of five, and the addition of two new, certification and test procedures for gasoline vapor recovery equipment. The revised and new certification and test procedures were part of the Board's ongoing effort to provide the most updated and accurate procedures for certifying systems to control gasoline vapor emissions during gasoline marketing operations and measuring the emission of air pollutants. In addition to supporting certification of vapor recovery systems and equipment, the amended procedures support emissions measurement and verification of proper operation of installed systems.

On December 12, 2002, the Board approved the amendment of ten certification and test procedures and the adoption of five new test procedures. This regulatory action was called EVR Technology Review and was, again, part of the Board's ongoing effort to improve the EVR program.

On July 22, 2004, the Board approved an amendment to Section 4.11 of Certification Procedure 201 (CP-201) to allow modifying vapor piping in dispensers without triggering the unihose dispenser requirement. This eliminated the need to replace existing dispensers that use individual hoses for each grade of gasoline.

On November 18, 2004, the Board approved an amendment to the regulations to extend the ORVR compatibility deadline for existing GDFs and amend other EVR regulation compliance dates to be consistent with the extensions allowed under the regulations (as authorized in Executive Orders G-70-203 and G-70-205). The effective date for in-station diagnostics (ISD) at GDFs with throughputs between

600,000 and 1,800,000 gallons per year was also revised to April 1, 2006, to maintain the ISD phase-in schedule.

On May 25, 2006, the Board approved amendments to a variety of EVR test procedures, including revisions to leak rate and cracking pressure standards for EVR pressure/vacuum (P/V) vent valves.

On June 21, 2007, the Board approved new certification and test procedures that would require EVR for ASTs. EVR requirements for ASTs would become effective in three stages, over several years. Standing Loss Control (SLC) would be required for existing ASTs as of April 1, 2013, followed by Phase I EVR on July 1, 2014, and Phase II EVR four years after certification of the first system.

The most recent amendments to EVR regulations involved adoption of a permeation standard for GDF hoses, and a clarification of the statutory requirement allowing existing facilities four years to upgrade their current equipment to meet applicable EVR standards. This amendment package was approved by the Board on September 22, 2011.

C) Legal Authority

1) State Law

Section 41954 of the Health and Safety Code (Appendix B) requires ARB to adopt procedures and performance standards for controlling gasoline emissions from gasoline marketing operations, including transfer and storage operations to achieve and maintain ambient air quality standards. This section also authorizes ARB, in cooperation with air districts, to certify vapor recovery systems that meet the performance standards and specifications. Section 39607(d) of the Health and Safety Code requires ARB to adopt test procedures to determine compliance with ARB's and air districts' standards for controlling air pollution from non-vehicular sources. Section 41954 also requires air districts to use ARB test procedures for determining compliance with performance standards and specifications established by ARB.

Likewise, Section 41962 of the Health and Safety Code (Appendix B) requires ARB to adopt procedures and performance standards for cargo tanks that are used to transport gasoline. The law requires that such standards must be reasonable and necessary to maintain applicable ambient air quality standards. The law also requires that ARB establish requirements that each cargo tank be tested and certified annually to ensure that the vapor recovery system is operating properly.

To comply with State law, the Board adopted the certification and test procedures for gasoline dispensing facilities and cargo tanks found in title 17, Code of Regulations, Sections 94011, 94014, and 94016 (17 CCR 94011, 94014, and 94016). The regulations incorporate by reference procedures for certifying vapor recovery systems and test procedures for verifying compliance with performance standards and specifications. These certification and test procedures serve to control gasoline vapor emissions from gasoline marketing operations, including transport and storage.

2) Federal Requirements

For GDFs, there are no federal regulations that are directly comparable to California's EVR program. However, federal regulations do require certain jurisdictions not in attainment with air quality standards to adopt control measures that will help bring them into attainment. Some other states mandate the installation of Phase I vapor recovery systems at gasoline dispensing facilities, and changes to ARB Enhanced Vapor Recovery (EVR) certification requirements may have a national and international impact.

For cargo tanks, federal standards comparable to California's Cargo Tank Vapor Recovery Certification Program standards can be found in 40 CFR Part 63 Subpart R - National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations). Due to the severe and unique air pollution problems facing California, ARB's gasoline vapor control standards are more stringent than comparable federal standards.

D) Applicability of Proposed Regulations

The proposed regulations consist of amendments to certification procedures and test procedures applicable to vapor recovery equipment used at gasoline dispensing facilities and cargo tanks in the State of California. In general, California's gasoline vapor recovery program is of interest to a wide variety of stakeholders including gas station owners, vapor recovery equipment manufacturers, installers, testers, maintenance contractors, air districts, cargo tank owners/operators, and entities generally concerned with air quality and its impact on public health. However, only a limited group of these stakeholders may be interested in the proposed regulations because they have no emission, economic, or environmental impact, and are very limited in scope, consisting of the following items:

1. Revisions to two test procedures used by ARB staff during the field evaluation of vapor recovery equipment for aboveground storage tank systems. The proposed revisions to these test procedures would not change vapor recovery equipment performance standards, and there would be no effect on the end users of the equipment.

2. Revisions to cargo tank certification and test procedures would eliminate the requirement for ARB certification of new vapor recovery equipment, which is consistent with current industry practices and the way that ARB has been implementing the cargo tank program for many years. ARB will continue to certify cargo tanks by issuing decals that will expire annually. Cargo tank owners/operators are still required annually to submit applications that include

results of static pressure tests and other information. ARB regulations currently affect approximately 5,000 cargo tanks in California.

E) Public Process

1) Web Site

Staff established the EVR Rulemaking web site (http://www.arb.ca.gov/vapor/rulemaking.htm) providing stakeholders with information regarding the proposed regulation. Stakeholders included on the vapor recovery e-mail list server are notified whenever new information is posted. As of March 2013, there were approximately 4100 subscribers to the main vapor recovery list and an additional 2800 subscribers to the cargo tank vapor recovery list.

2) Public Workshops

Beginning in October 2012, ARB staff conducted four public workshops for stakeholders to address technical and policy issues and to define regulatory development timelines. The dates and locations of the workshops are listed in Table I-2. Interested stakeholders participated in the workshops in person or via conference call or webcast. Workshop presentations and associated documents were posted on the EVR Rulemaking web site prior to the workshop dates, and are included in Appendix J. Workshop announcements were distributed to approximately 4100 vapor recovery e-mail list subscribers, as well as approximately 400 parties interested in vapor recovery whose contact information was provided by the South Coast Air Quality Management District (SCAQMD). In an effort to build consensus and minimize areas of disagreement, ARB staff consulted with representatives of the California Air Pollution Control Officers Association (CAPCOA) Vapor Recovery Subcommittee to refine the presentation materials prior to conducting public workshops.

Table I-2, Public Workshops

DATE	LOCATION
October 31, 2012	Sacramento
November 2, 2012	Diamond Bar
November 7, 2012	Fresno
April 23, 2013*	Sacramento

*Included discussion of the proposed amendments to cargo tank requirements

As a result of feedback provided during the public workshops, it was decided that several of the concepts presented by ARB staff would not be included in this proposed rulemaking. During the public workshops, only one substantive comment was offered on an item that is included in this proposed rulemaking. Section IX of this report includes a discussion of that comment.

F) State Implementation Plan

All geographic areas in California that are designated non-attainment of the National Ambient Air Quality Standards (NAAQS) are required by the federal Clean Air Act to prepare a State Implementation Plan (SIP) containing strategies to improve air quality and achieve the NAAQS. There are no emissions increases or reductions associated with the proposed regulations, so there will be no resultant impact on the SIP.

G) Climate Change Considerations

There are no emissions increases or reductions associated with the proposed regulations, so there will be no resultant impact on climate change.

II DESCRIPTION OF THE PROBLEM THAT THIS PROPOSAL ADDRESSES; PROPOSED SOLUTION AND SUPPORTING RATIONALE

The proposed amendments are intended to address a variety of minor issues with ARB's current EVR and Cargo Tank programs. These minor issues are unrelated to one another other than the fact that they all involve vapor recovery. Each problem, along with a description of staff's proposed solution, is discussed briefly in this section.

A) Revisions to TP-201.1

TP-201.1 – *Volumetric Efficiency for Phase I Systems* was adopted by the Board in 1996 and last amended in 2003. The procedure was originally intended for use on underground storage tank systems. It has been extensively used by ARB staff to determine the volumetric efficiency of the collection and containment of vapors during Phase I transfers on underground storage tank systems, and it has proven to be effective in that application. When EVR requirements were adopted for aboveground storage tanks in 2008, staff reasoned that TP-201.1 would be equally effective for use in determining volumetric efficiency of Phase I transfers into aboveground storage tanks. Subsequent field testing by ARB staff has shown that this is not the case, due to specific physical differences between typical aboveground storage tanks (ASTs) and underground storage tanks (USTs).

As compared to the USTs typically found at gasoline dispensing facilities, ASTs tend to be significantly smaller and subject to greater diurnal temperature variations. USTs used during ARB's EVR certification testing are generally between 8,000 and 20,000 gallons capacity. In contrast, ASTs used during ARB's EVR certification testing have been as small as 550 gallons capacity. When volatile liquid gasoline vaporizes within a tank, smaller tanks are far more subject to rapid increase in ullage pressure. This increase in ullage pressure leads to venting of vapors, which biases Phase I volumetric efficiency testing toward failure due to higher vent emissions. ASTs also differ from USTs in that they are not insulated by surrounding soil. ASTs are commonly classified as either "single-wall" or "protected". Single-wall ASTs are constructed with a primary (single) wall typically made of steel. Protected ASTs are constructed with a primary (inner) tank encased by a secondary (outer) tank, with a layer of insulating material (at least three inches thick) between the primary and secondary walls. The insulating material is usually lightweight concrete or a similar material. The single wall steel tanks are particularly prone to far greater fluctuations in temperature. Thermal expansion of gasoline liquid and vapor within an AST, caused by rapid temperature increase, can result in vent emissions which bias Phase I volumetric efficiency test results toward failure.

The small tank size and rapid temperature fluctuations found in ASTs were not factors considered when TP-201.1 was originally written. These factors can result in vent emissions that bias the test toward failure. Vent emissions caused by volatile fuel in a small tank and rapid thermal expansion are subject to and captured by the separate standards of Standing Loss Control (SLC). These vent emissions should not be included as part of Phase I system efficiency testing, so TP-201.1 is being amended to address those conditions that are specific to ASTs. ARB staff's rationale for these proposed amendments are provided in Appendix I, *Appropriateness of TP-201.1 Volumetric Efficiency for Phase I Systems on GDFs Equipped with Aboveground Storage Tanks.*

B) Revisions to TP-206.2

TP-206.2 - Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities Using Aboveground Storage Tanks was adopted by the Board in 2008. It is largely based on TP-201.2 - Efficiency and Emission Factor for Phase II Systems, which is used for USTs and was adopted by the Board in 1996 and last amended in 2012. In the 2012 amendments, TP-201.2 was revised to accommodate more modern sampling equipment, and to provide additional flexibility that is necessary to conduct testing on a wide variety of storage tank configurations encountered in the field. The amendments being proposed to TP-206.2 essentially mirror the 2012 amendments to TP-201.2, and are intended to accomplish the same results.

C) Deletion and Replacement of CP-204

The process for certifying cargo tank vapor recovery equipment is set forth in CP-204, Certification Procedure for Vapor Recovery System of Cargo Tanks which was first adopted on April 18, 1977 and was last amended on March 17, 1999. CP-204 lists the performance standards that vapor recovery equipment and cargo tanks must meet to be certified.

Section 41962 of the Health and Safety Code requires ARB to certify systems or equipment that recovers vapor from cargo tanks. Only those systems or equipment that ARB has certified by can be installed on cargo tanks. CP-204 makes specific the requirement that all cargo tanks must be certified annually to ensure that the vapor recovery systems are operating properly. Each year cargo tank owners/operators must submit an application with the information specified by CP-204 along with test results showing that cargo tanks comply with applicable performance standards as determined by TP-204.1. ARB certifies cargo tanks by issuing non-transferrable and non-removable decals that contain an expiration date. These decals must be affixed at a location that can be readily seen. Storage tank operators at terminals or bulk plants will refuse to transfer gasoline to cargo tanks that have an invalid decal or after the expiration date.

The proposed amendments to CP-204 would eliminate the requirement that cargo tank operators/owners install vapor recovery systems or equipment that has been certified by ARB. ARB has not certified cargo tank vapor recovery systems for several decades. Instead, ARB staff has found that focusing efforts on the enforcement of annual cargo tank testing requirements is a more effective means of ensuring compliance with applicable requirements. One benefit of the proposal is that it will continue to allow cargo tank operators a greater choice of vapor recovery systems and equipment. Vapor recovery equipment manufacturers would also continue to benefit by not having to undergo an ARB certification process each time they introduce new or redesigned cargo tank vapor recovery components to the market. Because ARB has not been enforcing the existing equipment certification requirements of CP-204 for many years, this proposal will have no material effect on the equipment manufacturers and cargo tank owners/operators.

The proposed amendments to CP-204 involve significant reorganization of many sections of the existing document, so staff has chosen to completely delete the existing version of CP-204 and replace it with a new version. This was done in order to make it easier for interested parties to read the newly proposed CP-204.

D) Revisions to TP-204.1

TP-204.1 – Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks was adopted by the Board in 1996 and last amended in 1999. This test is conducted on all cargo tanks annually to demonstrate compliance with applicable ARB performance standards. Staff is proposing to amend TP-204.1 to allow for the use of United States Environmental Protection Agency (U.S. EPA) Method 27, with minor amendments, as an equivalent test procedure. This change will allow cargo tank operators to conduct a single test annually that can be used to show compliance with both ARB and United States Department of Transportation requirements. Additional changes are proposed to TP-204.1 that will improve clarity and be more consistent with other ARB test procedures.

E) Revisions to TP-204.2

TP-204.2 – Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks was adopted by the Board in 1996 and last amended in 1999. Staff is proposing minor reorganization and editorial changes to TP-204.2 in order to improve clarity and be more consistent with other ARB test procedures.

F) Revisions to TP-204.3

TP-204.3 – Determination of Leak(s) was adopted by the Board in 1996 and last amended in 1999. Staff is proposing minor reorganization and editorial changes to TP-204.3 in order to improve clarity and be more consistent with other ARB test procedures.

III SUMMARY OF RECOMMENDED BOARD ACTION

Staff recommends that the Board approve the proposal to amend sections 94011, 94014, and 94016 of title 17, California Code of Regulations. The amendments would incorporate by reference the following new or amended Certification and Test Procedures:

- Test Procedure 201.1 – Volumetric Efficiency for Phase I Systems;
- Certification Procedure 204 – Certification Procedure for Vapor Recovery Systems of Cargo Tanks
- Test Procedure 204.1 – Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks
- Test Procedure 204.2 – Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks
- Test Procedure 204.3 – Determination of Leak(s)
- Test Procedure 206.2 - Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks

By approving the proposed amendments the Board would not cause any economic or environmental impacts, but would:

1. Resolve technical problems that currently exist with two test procedures used by ARB staff when certifying vapor recovery equipment for aboveground storage tanks; and
2. Reconcile the cargo tank certification and test procedures with current ARB policy and industry practices, and provide additional flexibility for cargo tank owners to remain in compliance with performance standards.

IV ENVIRONMENTAL IMPACTS ANALYSIS (CEQA Analysis)

A) Introduction

This section provides an environmental analysis for the proposed amendments to Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities and Cargo Tanks. Based on ARB's review, staff has determined that implementation of the proposed amendments would not result in any potentially significant adverse impacts on the environment. This analysis provides the basis for reaching this conclusion.

B) Environmental Review Process

ARB is the lead agency for the proposed amendments and has prepared this environmental analysis pursuant to its regulatory program certified by the Secretary of the Natural Resources Agency (14 CCR 15251(d); 17 CCR 60005-60007). In accordance with Public Resources Code section 21080.5 of the California Environmental Quality Act (CEQA), public agencies with certified regulatory programs are exempt from the requirements for preparing environmental impact reports, negative declarations, and initial studies (14 CCR 15250). As required by ARB's certified regulatory program, and the policy and substantive requirements of CEQA, ARB has prepared as part of this Staff Report an assessment of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulation and a succinct analysis of those impacts (17 CCR 60005(b)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for assessing the potential for significant impacts (17 CCR 60005(b)).

If comments received during the public review period raise significant environmental issues, staff will summarize and respond to the comments in writing. The written responses will be included in the Final Statement of Reasons (FSOR) for the regulation. Prior to taking final action on any proposed action for which significant environmental issues have been raised, the decision maker shall approve the written responses to these issues (17 CCR 60007(a)). If the amendments are adopted, a Notice of Decision will be posted on ARB's website and filed with the Secretary of the Natural Resources Agency for public inspection (17 CCR 60007(b)).

C) Prior Environmental Analysis

In March 2000, ARB approved the Enhanced Vapor Recovery (EVR) regulations for gasoline dispensing facilities (GDFs). The EVR regulations established new standards for vapor recovery systems to reduce emissions during storage and transfer of gasoline at GDFs. The EVR regulations were updated in 2001, 2002, 2004, 2006, 2007, and 2011. Previous updates were necessary to improve test procedures for vapor recovery system certifications, and to modify performance standards or implementation dates to reflect issues associated with evolving technology.

On April 18, 1977, the Board first approved performance standards for controlling emissions from cargo tanks used to transfer gasoline from loading terminals to GDFs. Since 1977, the cargo tank requirements were amended a number of times, the last occurred in 1999. Each amendment clarified the requirements and improved the process for ARB certification of equipment used on cargo tanks for the control of gasoline vapors.

Previous environmental analyses for the regulations and subsequent amendments discussed potential beneficial environmental impacts to air quality. No adverse environmental impacts were identified.

D) Proposed Regulation

1) Description

The proposed amendments are described in detail in Section II of this Staff Report. Briefly, the proposed amendments include the following changes:

- Improve two test procedures used by ARB staff during certification of vapor recovery equipment on aboveground storage tanks (AST); and

- Replace the outdated cargo tank certification procedure with a new certification procedure and revise three test procedures for equipment used on cargo tanks to control gasoline vapor emissions.

2) Methods of Compliance

The test procedure amendments proposed would require ARB staff conducting certification testing of new vapor recovery equipment to follow the revised test procedure. This proposal requires no action on the part of anyone other than ARB staff.

The proposed changes to the Certification Procedure for the Vapor Recovery Systems of Cargo Tanks (CP-204) will allow the regulated community more flexibility in performing the annual certification test by allowing the use of the Federal Test Method required by the United States Department of Transportation (DOT) as part of the required safety testing cargo tank owners are required to perform annually. By allowing the Federal Test Method (applying CP-204's test limits) in lieu of ARB's TP-204.1, owner/operators can perform one test procedure to meet ARB's and DOT's requirements thus eliminating the confusion between the DOT test expiration date and ARB's test expiration date. The use of the Federal Test Method in lieu of TP-204.1 is completely optional and will require no additional equipment or training as owner/operators must already be trained to perform the DOT required test as well as TP-204.1.

E) Environmental Impacts

1) Resource Areas with No Impacts

Based on ARB's review of the proposed regulatory amendments, staff concludes that the amendments would not have a significant adverse effect on the environment. Compliance with the proposed amendments would not result in any adverse physical change to the existing environment because the amendments affect test procedures used during certification of vapor recovery equipment, and certification procedures and test procedures for equipment used on cargo tanks. Thus, the amendments would not involve or result in any adverse physical changes to the existing environment, such as new development, modifications to existing buildings or facilities, or new land use designations. ARB staff finds that it is not reasonably foreseeable that there will be any adverse impacts on aesthetics, air quality, agricultural and forestry resources, biological resources, cultural resources, geology and soils, greenhouse gases, hazardous material, hydrology and water quality, land use planning, mineral resources, noise, population and housing, public services, recreation, or traffic and transportation because the proposed amendments would not require any action by regulated parties that could affect these resources.

No discussion of alternatives or mitigation measures to address significant adverse environmental impacts is necessary because no significant adverse environmental impacts would result from implementation of the proposed amendments.

V ENVIRONMENTAL JUSTICE

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, rules, and policies (Senate Bill 115, Solis; Stats 1999, Ch. 690; Government Code § 65040.12(e)). The Board has established a framework for incorporating environmental justice into ARB programs consistent with the directives of State law. There are no emissions increases or reductions associated with the proposed regulations, so there will be no environmental justice issues to consider.

VI ECONOMIC IMPACTS

Staff does not expect the proposed regulation to impose any costs or have any economic impact on businesses or individuals located in California. The proposal will not result in the creation or elimination of any jobs. Although there is no economic impact from the proposed regulation, revision of these vapor recovery test procedures will provide greater clarity to individuals conducting these tests, will help to make California's requirements more consistent with federal Department of Transportation requirements, and will benefit cargo tank operators who must meet these requirements. Form 399, which summarizes the economic and fiscal impacts of the proposed amendments, has been completed and is included in the rulemaking record.

A) Fiscal Impacts

Staff does not expect the proposed regulation to impose any cost on implementing State government agencies.

1) Impacts on California Businesses and Job Creation

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative rule. The assessment shall include a consideration of the impact of the proposed regulation on California jobs, business expansion, elimination or creation, and the ability of California business to compete.

No costs or savings are associated with this proposal, so staff has determined that there are no significant economic impacts to businesses or individuals within California due to the proposed performance standard or implementation schedule. The proposal will not result in the creation or elimination of any jobs within or outside of California.

2) Costs to State and Local Agencies

Section 11346.5 of the Government Code requires State agencies to estimate the cost or savings to any State agency, local agency, or school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

There are no costs or savings associated with this proposal, so staff has determined that there are no significant costs to any State agency, local agency, or school district imposed by the proposed regulation. Staff does not expect an adverse impact on other State or local agencies.

3) Economic Impacts of Alternatives

Health and Safety Code Section 57005 requires the ARB to perform an economic impact analysis of submitted alternatives to a proposed regulation before adopting any major rule. A major rule is defined as a rule that will have an economic impact on California business enterprises or individuals in an amount exceeding 50 million dollars as estimated by the ARB. The estimated economic impact of the proposed regulation does not exceed this threshold.

VII ALTERNATIVES CONSIDERED

In accordance with Government Code Section 11346.5, subdivision (a)(13), ARB must determine that no reasonable alternative the Board considered or that has otherwise been identified and brought to the Board's attention would be more effective in carrying out the purpose of the proposed regulation or would be as effective and less burdensome to affected private persons than the proposed regulation. This section of the staff report discusses alternatives to the proposed regulation.

A) Revisions to TP-201.1

Alternative 1: Make No Changes

Staff considered the possibility of making no amendments to TP-201.1 and continuing to use it for determining the efficiency of Phase I EVR systems on aboveground storage tanks. Two Phase I EVR systems for aboveground tanks have already been certified using the current test procedure. However, in order for a well-designed Phase I EVR system to pass the current test procedure, testing must be conducted with a nearly empty tank during cool weather and using cool fuel for the delivery. The same Phase I EVR system that passes testing under those controlled conditions will fail when tested on a warm day with a more full tank and warm fuel being delivered. Staff believes that it is appropriate to formally correct the deficiencies in this test procedure rather than to work around those deficiencies by selectively conducting the test at specific conditions.

Alternative 2: Draft an Entirely New Test Procedure for Determining Efficiency of Phase I EVR Systems for Aboveground Storage Tanks

Staff considered proposing an entirely new test procedure for determining efficiency of Phase I EVR systems that was unique to aboveground storage tanks. This procedure would have been numbered TP-206.4, following the numbering convention used for other procedures specific to aboveground storage tanks. Staff determined that such a test procedure would likely be very similar to the current TP-201.1, with only a few changes to make it applicable to aboveground storage tanks. However, presenting this as a new test procedure would make it appear as though substantial revisions are made. This would make it difficult for interested parties to distinguish material that was being newly proposed from material that was copied directly over from TP-201.1. Staff believes that it is more clear and effective to simply amend the current TP-201.1 to address the deficiencies specific to aboveground storage tanks.

B) Revisions to TP-206.2

Alternative 1: Make No Changes

Staff considered the possibility of making no amendments to TP-206.2. This alternative would force ARB testing staff to continue utilizing the current test procedure. It would prohibit the use of newer analytical equipment and data logging equipment that is available to ARB staff. This could lead to more time spent with equipment set-up, calibration, and data analysis than would be required when using the amended test procedure.

C) Deletion and Replacement of CP-204

Alternative 1: Make No Changes

Staff considered making no changes to CP-204. Currently, ARB is not certifying vapor recovery equipment for cargo tanks as required by CP-204. ARB cannot continue to disregard the vapor recovery equipment certification requirements currently found in CP-204. If ARB were to begin enforcing that provision, new components would have to go through an ARB certification evaluation, which would be a disincentive to manufacturers bringing new components to market. Additional ARB staff would have to be hired, or existing staff reassigned, to implement a certification program. Vapor recovery component costs, and the time it takes for new components to be introduced to the market, would likely increase. Staff does not expect that the additional cost and regulatory burden of implementing the certification program as currently required by CP-204 would result in any reduction in emissions from cargo tanks. Therefore, staff concludes that it is best for CP-204 to be amended as proposed.

D) Revisions to TP-204.1

Alternative 1: Make No Changes

Cargo tanks used in California are currently required to be tested annually using two separate test procedures; one for the state and one for the federal government. The current proposal provides an option to demonstrate compliance with California and federal requirements with a single test. Staff determined that leaving TP-204.1 unchanged is unacceptable because it would not ease the regulatory burden on cargo tank operators.

Alternative 2: Adopt the Federal Requirements for Cargo Tanks

Staff considered adopting the federal requirements for cargo tanks. This alternative would allow cargo tanks to be certified to a less stringent standard than found in the current TP-204.1. Also, the federal program requires owners/operators to only maintain records of annual testing for their fleet of cargo tanks; there is no requirement similar to California's requirement for owners/operators to notify ARB when an annual certification test will take place allowing program inspectors the opportunity to observe the test. Staff believes that the certification test notification is a valuable enforcement tool in reducing emissions from cargo tanks. Furthermore, the federal test procedure will allow more gasoline vapors to be emitted into the air because it allows the purged cargo tank to be vented into the atmosphere. California requires that any venting must be to a control device that is approved by both ARB and the local air district. Therefore adopting the federal standards is not an adequate alternative.

No other alternatives have been identified and considered.

VIII SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION

A) Introduction

This section of the staff report consists of detailed discussions for each of the proposed amendments to this regulatory package: revisions to vapor recovery regulations pertaining to GDFs equipped with aboveground storage tanks (TP-201.1 and TP-206.2), and revision of vapor recovery regulations pertaining to Cargo Tanks (CP-204, TP-204.1, TP-204.2, and TP-204.3).

B) Revisions to TP-201.1

The following is a summary of the specific regulatory amendments that are proposed for TP-201.1. The full proposed regulatory language shown in strike and add format are included in Appendix C.

Section 1 has been amended to clarify that this test procedure is applicable to both USTs and ASTs. This amendment improves clarity, but does not substantively alter the test procedure.

Section 2 has been amended to reference the performance standard for Phase I system volumetric efficiency for aboveground storage tanks, which is found in CP-206. This amendment improves clarity, but does not substantively alter the test procedure.

Section 3.3 has been amended to reference the leak decay performance standard for ASTs, which is found in section 4.2 of CP-206. This amendment was necessary because TP-201.1 is applicable to aboveground tanks whose standards and specifications are contained in CP-206.

Sections 6.2 and 8.6 have been amended to reference TP-206.3, which is the test procedure that must be used to determine leak integrity of ASTs. This amendment improves clarity, but does not substantively alter the test procedure.

Section 6.6 has been amended to include instructions for the tester to use the reporting form that is included with this test procedure. This amendment improves clarity, but does not substantively alter the test procedure.

Section 6.10 has been amended to address a problem unique to ASTs, due to their small overall capacity. It is not uncommon for the vapor space of a fuel delivery truck to be under slight pressure when it arrives at the gasoline dispensing facility and connects to the storage tank. Once the delivery truck is connected to the storage tank, pressure between the two will begin to equalize. Pressure within the cargo tank can easily pressurize the small AST, leading to venting of emissions through the pressure/vacuum vent valve. This venting biases the test toward failure. That bias is eliminated by resetting the volume meter totalizer to zero once pressure has stabilized between the cargo tank and the aboveground storage tank.

Section 7.6 has been amended to address thermal expansion of liquid and vapor gasoline, which is a problem unique to aboveground storage tanks. After fuel has been delivered into the aboveground tank, warm air and sunlight on the tank surface can tend to warm the fuel within the tank. This results in expansion of that fuel, which can lead to venting. That venting, which occurs after the delivery from the cargo tanker is completed, is unrelated to the performance of the Phase I EVR system. Including that venting in the Phase I efficiency calculation, as required by the current procedure, can bias the test toward failure. This bias is removed by eliminating the requirement to monitor vent pipe emissions for up to 60 minutes following a delivery when testing ASTs. It should be noted that emissions associated with thermal expansion are subject to regulation under Standing Loss Control provisions of CP-206, which are not being amended in this rulemaking.

Sections 9.1 and 9.2 have been amended to better clarify the existing equations, although there is no change to the equations themselves. This amendment improves clarity, but does not substantively alter the test procedure.

Figure 3 has been renamed to clarify that it applies to underground storage tanks only. This amendment improves clarity, but does not substantively alter the test procedure.

Figures 4 and 5 have been added to illustrate typical configurations of test equipment when used on aboveground storage tanks. This amendment improves clarity, but does not substantively alter the test procedure.

General Revisions: Throughout the document, the terms "storage tank" and "underground storage tank" have been amended as needed to clarify that this test procedure is applicable to both aboveground and underground storage tanks.

C) Revisions to TP-206.2

The following is a summary of the specific regulatory amendments that are proposed for TP-206.2. The full proposed regulatory language shown in strike and add format are included in Appendix D.

Section 1 has been amended to clarify that the test procedure will quantify emissions from the pressure/vacuum (P/V) vent valve as well as the processor. This is not a substantive change, since this test procedure has always included quantification of P/V vent valve emissions. Section 1 has also been amended to clarify that changes to the test procedure must be approved in writing by the Executive Officer. This is not a new requirement, since it is included within CP-206, but it has been added here for clarity and to be consistent with the format of other EVR test procedures.

Section 2 has been amended for clarity. Separate language has been added to clarify the process for measuring the inlet and outlet of the vapor processor. The language requiring testing to be conducted during summer months, and within a specified temperature range, has been deleted from section 2. Those requirements still apply, and can now be found in section 9.1.1.

Section 3.1 has been amended to clarify that failure of the required Static Pressure performance test will invalidate results of the Standing Loss Control (SLC) emission factor test. This has always been ARB staff policy, but it is now stated within the test procedure.

Section 4.2 has been amended to delete the maximum efficiency error. The previous maximum efficiency error of 1% is not valid because this test procedure is not designed to calculate vapor recovery system efficiency. Instead, the procedure is designed to calculate an emission factor. Since no efficiency percentage is being calculated in this test, it is not appropriate to specify a maximum allowable error in efficiency.

Section 5.1.1 has been amended to correct grammar.

Section 5.1.2 has been amended to allow for the use of non-dispersive infrared (NDIR) analyzers as well as flame ionization detector (FID) type analyzers. This change is supported by ARB test data that shows NDIR analyzers can produce comparable results to FID analyzers over the range of concentrations expected in this test. Additionally, FID analyzers are not appropriate for testing at the processor inlet point because sample gas fed into a FID is destroyed and cannot be returned to the vapor processor inlet stream. Using an NDIR at the inlet point allows for that sample to be returned to the processor inlet stream, so that sampling does not interfere with processor performance.

Section 5.1.3 is added to describe specifications for analyzers used on the outlet of destructive vapor processors. For those processors it is necessary to measure carbon monoxide and carbon dioxide, which are products of combustion within the processor. Specifications for these processors were previously contained in section 5.1.6.

Sections 5.1.4, 5.1.5, and 5.1.6 have been renumbered to accommodate the addition of new language in section 5.1.3. Section 5.1.4 has been amended to address the possibility that testing may include instrumentation designed to detect gases other than hydrocarbons. Those instruments will need to be calibrated using a gas standard that contains the compound being measured.

Table 5-1 has been amended to include separate calibration concentrations for instruments used at the processor inlet and outlet points. Minor changes have been made to calibration values. These changes are based on ARB staff experience with available gases and with the analyzers used to conduct this test. Changes to this table will not result in any decrease in the accuracy or precision of the instruments used for testing.

Section 5.1.6 has been deleted. For clarity, the language previously found in section 5.1.6 has been moved to section 5.1.3.

Section 5.2 has been amended to include analyzers measuring gases other than hydrocarbons, such as carbon monoxide and carbon dioxide. In addition, new language has been added requiring more data to be collected in the permanent test record. The addition of temperature and pressure measurements to the permanent test record, as well as the new requirement for the interval of averaging not to exceed 1-minute, will serve to improve the overall quality of the test data. These new requirements are common practice for ARB staff conducting this test, but they are now specifically required by the test method.

Table 5-2 has been amended to include a reduced vent sleeve sweep rate. This reduced sweep rate is more easily achieved by the smaller sample pumps commonly used for field testing, and it has been shown by ARB's in-house testing to be equally effective to the previously required sweep rate.

Section 5.3.3 has been amended to allow for the installation of a test manifold at either the inlet or outlet point of the processor and the test manifold must be designed to accommodate the required temperature and pressure measurement devices.

Section 5.3.5 has been amended to specify the typical temperature measurement range of 0 to 200 °F. Allowance remains for the use of other temperature ranges if appropriate for the processor being tested.

Section 5.4.1 has been amended to remove the previous reference to the pump specifications in TP-201.1A. Instead of referencing another test procedure, the pump specifications are now more easily accessed within this section.

Sections 5.4.2 and 5.4.3 have been added to describe the sampling apparatus that is to be used on the outlet of destructive processors. Destructive processors typically involve combustion of hydrocarbon vapors, which results in an exhaust gas stream that can be difficult to accurately sample. The sampling equipment configurations described in sections 5.4.2 and 5.4.3 have been used successfully by ARB staff for several years, and are now being incorporated formally into this test procedure.

Section 5.5 (including subsections 5.5.1, 5.5.1.1, 5.5.1.2, 5.5.2, and 5.5.3) has been added to describe the sampling apparatus that is to be used at the P/V vent valve location. P/V vent valves can be manufactured in a variety of sizes. Also, some P/V valves vent under pressure in a slow, seeping manner. Others will tend to vent under pressure in a series of large, distinct pulses. Because of the variety of P/V vent valve dimensions and performance characteristics, the P/V vent valve sampling apparatus is defined based on a performance standard rather than a prescriptive design. Performance of the test apparatus must be field verified, using a calibration gas as described in section 5.5.1.1, to demonstrate that any hydrocarbons escaping from the

P/V vent valve are captured. Because P/V vent valves operate within a very strictly defined differential pressure range, section 5.5.1 dictates that the test apparatus can result in a pressure drop of no more than 0.01 inches of water column. Sections 5.5.2 and 5.5.3 define the materials that can be used for the sampling apparatus and pump. The materials were selected to ensure that no hydrocarbons are trapped within, or introduced by, the sampling apparatus.

Sections 5.6, 5.7, and 5.8 have been renumbered to accommodate the addition of new language in section 5.5.

Section 6.1 has been amended to reflect the fact that calibration procedures have been moved to section 10 from the previous section 8.1.1.

Section 7.2 has been deleted and replaced with new language. The deleted language regarding P/V vent sampling has been moved, with amendments, to section 7.3. The new language in section 7.2 describes sampling procedures for the upstream and downstream points of the vapor processor.

Section 7.2.1 has been added to describe sampling procedures for the upstream point of destructive vapor processors. This section references United States Environmental Protection Agency (U.S. EPA) Method 2B, which is the same method that was referenced in section 7.3.1 of the previous version of this test procedure.

Section 7.2.2 has been added. This section includes a slightly amended version of the language previously found in section 7.3.1. The amendments are intended to improve clarity. Additionally, there is a new requirement that sampling at the outlet of destructive processors should include a measurement of hydrocarbons. In most cases it is not expected that there would be a significant amount of hydrocarbons at the processor outlet, but it must be measured and included in the final system efficiency calculation.

Section 7.2.3 is added to describe the sampling procedure for hydrocarbons in the outlet of non-destructive vapor processors. This new language is needed since hydrocarbon concentration in the exhaust of non-destructive processors was not explicitly required to be measured in the previous version of this test procedure. It is critical that the processor be tested in its normal operating configuration, so the sampling apparatus must be set up in such a way that it does not interfere with processor operation. Based on ARB staff experience, it is likely that sample flow rates exceeding one half of the processor flow rate can result in ambient air being ingested by the sampling system, diluting the sample and reducing the measured hydrocarbon concentration, producing a low bias in the calculated emission factor. Returning the analyzed sample to the manifold will prevent sample dilution and eliminate this potential bias.

Section 7.3 is added to describe the procedure for sampling at the P/V vent valve. The language in this section is similar to what was previously found in section 7.2, but with additional details added for clarity.

Section 7.6 is amended to clarify that the facility must be leak tested before and after installation of the sampling apparatus. The leak test conducted prior to installation of the test apparatus serves to validate the integrity of data collected during the certification testing prior to that point. The leak test conducted after installation of the test apparatus serves to establish that the tank system is in compliance with leak integrity standards during the TP-206.2 efficiency testing.

Section 8.1.1 has been amended to clarify that calibration is to be done with gases in order from lowest to highest concentration. This is consistent with industry standards and applicable U.S. EPA and ARB test methods.

Section 8.2 has been added to describe a bias check of the sampling system. Sampling systems can vary widely based on field conditions and the type of processor being tested. This bias check is designed to ensure that the sampling system does not skew the results of the test. The added bias check procedure and calculation (Equation 8.1) is identical to bias check procedures used in several other existing EVR Test Procedures. Adding a bias check to this test procedure increases confidence in the final test results, but does not add significantly to the time or cost of testing.

Sections 8.3, 8.3.1, 8.3.2, 8.4, and 8.5 have been renumbered to accommodate the addition of new language in section 8.2.

Section 9 is amended for clarity, and to specify that data for this test will be collected from multiple sample points.

Section 9.1.1 is amended to include a reference to the requirements for testing in summer and at a specific temperature. Those requirements were previously contained in section 2.

Section 9.1.2 is deleted for clarity. The temperature requirements previously found in this section are now included by reference in section 9.1.1.

Sections 9.1.3 and 9.1.4 have been renumbered to accommodate the removal of section 9.1.2.

Section 10.1 has been added to require that a sample system bias check must be conducted at the end of each test day. The bias check is identical to the check required prior to testing per section 8.2, and is similarly intended to increase confidence in the final test results.

Sections 10.2, 10.3, 10.4, 10.5, and 10.6 have been renumbered to accommodate the addition of new language in section 10.1.

Section 11.2 has been amended to clarify that failure of the facility leak test after completion of efficiency testing will invalidate the results of the efficiency test. A leaking tank system could bias standing loss efficiency testing results toward either passing or failing, depending on the location of the leak and the type of vapor processor. By passing leak tests both before and after the efficiency testing, it is reasonable to assume that the tank system was in compliance with leak integrity standards throughout the efficiency testing process, and that no bias from leaks has occurred.

Sections 12.1, 12.1.1, and 12.1.2 have been amended for clarity. The changes help to more clearly specify which test point is being discussed in each equation. Also, a definition has been added for each constant used in these equations.

Section 12.2 (including subsections 12.2.1, 12.2.2, and 12.2.3) has been added to specify the means of calculating the emission factor for destructive processors. This procedure is based on the carbon balance principle contained in U.S. EPA Method 2B, incorporated by reference in ARB TP-201.2, section 12.4.2. It is identical to the method currently used by ARB for determining the emission factor of vapor recovery systems used on underground storage tanks and gasoline bulk distribution terminals.

Section 12.3 (including subsections 12.3.1 and 12.3.2) has been amended for clarity, and to specify that the emission factor must be calculated for each 24-hour period and reported in pounds of hydrocarbons per 1000 gallons dispensed. These requirements are consistent with other ARB vapor recovery efficiency test procedures. The language previously contained within section 12.3 and subsection 12.3.1 has been deleted since it is made redundant by the amended language.

General Revisions: The term "hydrocarbon analyzers" has been replaced with "continuous gas analyzers" throughout the test procedure. This change is appropriate because some of the analyzers used in this test may also measure gases other than hydrocarbons. Various minor grammatical errors have been corrected.

E) Deletion and Replacement of CP-204

The following is a summary of the specific regulatory amendments that are proposed for CP-204. The changes to CP-204 involve significant reorganization of many sections of the existing document, so staff has chosen to completely delete the existing version of CP-204 and replace it with a new version. This was done in order to make it easier for interested parties to read the newly proposed CP-204. The full proposed regulatory language of CP-204 is shown in Appendix E. The first part of Appendix E shows the existing CP-204 that is being proposed for deletion. The second part of Appendix E shows the new version of CP-204 that is being proposed for adoption.

Section 1 – General Information and Applicability. This section clarifies that the Certification Procedure applies to the certification of cargo tanks equipped with a system that recovers vapor during the loading and unloading of gasoline. It also lists other state agencies that have jurisdiction over cargo tanks and ARB is not responsible for getting approvals from these agencies. The requirements in this section are essentially the same as those found in section 1 of the current version of CP-204.

Section 2 – Summary of Certification Process. This section states that cargo tank owners/operators are required to apply for certification for any cargo tank that is operated in California. The requirements contained in this section are necessary in order to clarify and make specific the process for certification of cargo tanks in California, as required by Section 41962 of the Health and Safety Code. Many of the requirements contained in this section are the same as those found in section 2 of the current version of CP-204. However, there are two substantive changes:

First, rather than requiring certification of newly designed systems or components prior to allowing their use in California, the focus is now placed on a certification that is solely based on in-use performance testing of cargo tanks. While this appears to be a significant change, it will result in no change to affected parties because it is consistent with the way ARB has been implementing the cargo tank vapor recovery program for decades.

The second substantive change is the new requirement that notification prior to testing and submission of test results must be done electronically via ARB's online reporting system. Submittal of this information has always been required per CP-204, but it now must be submitted online. ARB has been working with cargo tank operators to transition from paper copies to online submittal of data since 2009. Since 2011, all cargo tank operators in California have been submitting information online voluntarily. By adding this requirement to CP-204, staff intends to promote continued statewide consistency and continued use of the existing online data submittal system.

Other than the two items discussed in the previous paragraphs, certification requirements remain essentially unchanged from the previous version of CP-204. The application must contain the results of annual testing to verify compliance with the applicable performance standards listed in Section 3. Prior to conducting any test, cargo tank owners/operators are required to notify the Executive Officer so that the Executive Officer or designee may observe or conduct the test. The cargo tank must be compatible with an ARB certified vapor recovery system at terminal storage tanks or with a Phase I system at GDFs. When the Executive Officer determines that the application complies with the requirements, the Executive Officer will issue a non-transferrable and non-removable decal that is affixed in a location on the cargo tank as specified in CP-204. A stamped copy of the application is returned and must be kept with the cargo tank. The cargo tank owner/operator will be charged a fee not to exceed the actual cost of certification. Payment of the fee is a condition of certification, as authorized by Section 41962(f) of the Health and Safety Code

Section 3 – Performance Standards and Test Procedures. This section lists the five minute performance standards, daily static pressure performance standard or one minute standard, and vapor and liquid leak performance standards which are determined in accordance with TP-204.1, TP-204.2, and TP-204.3, respectively. Testing for the five minute standard must be done annually with an empty cargo tank. Testing for the one minute standard can be done daily with a full cargo tank. These performance standards have not changed and are identical to performance standards found in section 4 of the current version of CP-204. Section 41962(a) of the Health and Safety Code requires ARB to adopt test procedures to determine compliance of vapor recovery system on cargo tanks, so this section of CP-204 is necessary in order to implement that requirement.

Section 4 – Requirement for Determination of Compliance and Violation. This section is identical to language that has been proposed to be deleted from section 9 of both TP-204.1 and TP-204.2. This language has been removed from those test procedures and placed into the certification procedure for clarity and consistency. ARB's general practice is that the test procedure explains or describes the test and the certification procedure sets forth the pass/fail criteria and explains the implication of test results. This section has not changed from the language previously found in TP-204.1 and TP-204.2 with exception of non-substantial or grammatical modifications.

Section 5 – Alternate Test Procedures. This section explains the process for the Executive Officer to approve alternate test procedures that may be used in lieu of adopted test procedures. This process is similar to the one established in CP-201, Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities. Anyone can request approval of an alternate test procedure by providing the requested information to the Executive Officer or designee. The proposal requires the Executive Officer (or a third party under the direction of the Executive Officer) to conduct all testing to determine the acceptability of the alternate procedure. Such testing shall be conducted in accordance with U.S. EPA Method 301, Field Validation of Pollution Measurement Methods from Various Waste Media. For those situations where U.S. EPA Method 301 is not applicable, the Executive Officer can establish equivalence based on concepts of comparison with established methods and statistical analysis of bias and variance. This section is necessary to provide flexibility for cargo tank operators who may, for technical reasons, want or need to test their cargo tanks in a manner that differs from the ARB test procedures. The language is intended to provide flexibility while ensuring that any alternative test method adheres to the same performance standards and provides the same level of environmental protection that is offered by the equivalent ARB test procedures.

F) Revisions to TP-204.1

The following is a summary of the specific regulatory amendments that are proposed for TP-204.1. The full proposed regulatory language shown in strike and add format is included in Appendix F.

Section 1 - Applicability. This section was revised to improve clarity, and to be consistent with the format used in other similar ARB test procedures. Amendments to this section include a minor editorial change by correcting the title of D-200, Definition for Vapor Recovery Procedures. Other proposed changes include making it clear that this test procedure is used to determine compliance with the five minute static performance standard referenced in CP-204 and deleting all references to determination of compliance and violations and modifications. The last two items are now included in CP-204.

Section 2 – Principle and Summary of Test Procedure. This section has been amended to provide some additional details within the summary of the test procedure, which helps to improve clarity of the test procedure. Instructions to avoid conducting the test in direct sunlight have been deleted from this section and moved to Section 3, which is more appropriate since sunlight on the tank is a factor that could bias a test toward passing.

Section 3 – Bias and Interference. This section has been amended to include instructions that this test should be conducted in full shade. This instruction was previously contained in Section 2. Moving it to Section 3 improves clarity since sunlight on the tank is a factor that could bias a test toward passing.

Existing Section 4 – Sensitivity, Range, and Precision. The proposal is to delete this heading since it contains no data or information. Removing this section shortens and simplifies the written test procedure.

Proposed Section 4 – Equipment. Minor non-substantial editorial modifications are proposed. This amendment improves clarity, but does not substantively alter the test procedure.

Existing Section 5 – Equipment. This section is now renumbered as 4, to account for the removal of the previous Section 4.

Proposed Section 5 - Pre Test Protocol. The proposed language would make it clear that purging the cargo tank into the atmosphere is prohibited and requires purging be accomplished by one of four procedures. These purging requirements were originally listed in CP-204 but it is more appropriate to be referenced in the test procedures since purging the tank is done as part of the actual test procedure. Individuals conducting this test are more likely to reference the written test procedure than the associated certification procedure, so placing the requirement within the test procedure helps improve clarity.

Existing Section 6 – Calibration Procedure. The proposal is to delete this heading since it contains no data or information. Removing this section shortens and simplifies the written test procedure.

Proposed Section 6 – Test Procedure. Minor editorial changes were made in various subsections. These amendments improve clarity, but do not substantively alter the test procedure.

Existing Section 7 – Pre-Test Protocols. This section is proposed to be renumbered as 5, to account for the removal of the previous Sections 4 and 6.

Proposed Section 7 – Requirement at Conclusion of Pressure Testing. This section was moved from CP-204 since the actions described in this section are part of the actual test procedure. Individuals conducting this test are more likely to reference the written test procedure than the associated certification procedure, so placing the requirement within the test procedure helps improve clarity.

Existing Section 8 – Test Procedure. This section is proposed to be renumbered as 6, to account for the removal of the previous Sections 4 and 6.

Proposed Section 8 - Reporting Results. This section was revised to require that all results be reported electronically through the ARB Online Cargo Tank Vapor Recovery Certification Program at www.arb.ca.gov/enf/cargotanks/cargotanks.htm. Online submittal of test results has been available since 2009, and ARB staff has worked with cargo tank operators over the past several years to encourage its use statewide. Since 2011, all cargo tank operators in California have been submitting information online voluntarily. By adding this language to Section 8, staff intends to promote continued statewide consistency and continued use of the existing online data submittal system.

Existing Section 9 –Determinations of Compliance and Violation. This section is proposed to be moved to CP-204 since it deals with implications of test results. This language has been removed from the test procedure and placed into the certification procedure for clarity and consistency. ARB's general practice is that the test procedure explains or describes the test and the certification procedure sets forth the pass/fail criteria and explains the implication of test results.

Proposed Section 9 – Alternate Test Procedure. Changes include making U.S. EPA Method 27 equivalent to TP-204.1 with three exceptions. These exceptions include compliance with purging requirements of TP 204.1, not allowing averaging of two successive tests, and defining a valid test as successfully passing three TP-204.1 tests (pressure, vacuum, and internal vapor valve) consecutively in any sequence. These exceptions are consistent with current policy, and help to ensure that the U.S.EPA test method is equally stringent to the ARB method. By allowing the use of the U.S.EPA test method to meet ARB requirements, cargo tank operators will now have the option to conduct a single annual test that will serve as the basis for establishing compliance with both California and federal requirements. This could result in a significant reduction in the burden of maintaining compliance for those cargo tank operators who are currently conducting separate tests to meet federal and California requirements.

This section has also been amended to remove instructions for obtaining ARB approval for the use of other alternative test methods. The process for obtaining approval for other equivalent test methods has been added to section 5 of CP-204, which improves clarity and is consistent with the format that ARB uses in other similar certification and test procedures.

Existing Section 10 – Quality Assurance/Quality Control (QA/QC). This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 11 – Recording Data. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 12 - Calculating Results. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 13 – Reporting Results. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 14 – Alternate Test Procedures. This section is proposed to be renumbered as section 9, to account for the removal of previous sections.

Existing Section 15 - References. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 16 – Figures. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

G)Revisions to TP-204.2

The following is a summary of the specific regulatory amendments that are proposed for TP-204.2. The full proposed regulatory language shown in strike and add format are included in Appendix G.

Section 1 – Applicability. This section was revised to include a minor editorial change by correcting the title of D-200, Definition for Vapor Recovery Procedures. Other proposed changes include making it clear that this test procedure is used to determine compliance with the one minute static performance standard referenced in CP-204 and deleting all references to determination of compliance and violations and modifications. The last two items are now included in CP-204, which improves clarity and is consistent with the format that ARB uses in other similar certification and test procedures.

Section 2 – Principle and Summary of Test Procedure. Minor non-substantive editorial modifications have been made to improve clarity and use terminology that is consistent with other similar ARB certification and test procedures.

Section 3 – Biases and Interference. Corrected a section number reference within the test procedure to account for the removal and renumbering of sections. Other minor non-substantive editorial modifications have been made to improve clarity.

Section 4 – Sensitivity, Range, and Precision. Minor non-substantial editorial modifications were made in this section to improve clarity.

Section 5 – Equipment. Minor non-substantial editorial modifications were made in this section to improve clarity. Reference to a specific make/model of pressure measurement device was removed to help increase flexibility and make it clearer that other makes/models of pressure measurement devices are acceptable.

Existing Section 6 – Calibration Procedures. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Proposed Section 6 – Pre-Test Protocols. Minor non-substantial editorial modifications were made in this section to improve clarity.

Existing Section 7 – Pre-Test Protocols. Proposal is to move Pre-Test Protocols to Section 6 to account for the removal of previous sections.

Proposed Section 7 – Test Procedure. Proposal is to delete the requirement to provide written test results since all test results must be submitted electronically to the ARB Online Cargo Tank Vapor Recovery Certification Program. Other minor non-substantial editorial modifications are made in this section to improve clarity and use terminology that is consistent with other similar ARB certification and test procedures.

Existing Section 8 – Test Procedure. Proposal is to move Test Procedure to Section 7 to account for the removal of previous sections.

Proposed Section 8 – Requirements at the Conclusion of Pressure Testing. Proposal is to move this language from CP-204 since the actions described in this section are part of the actual test procedure. Individuals conducting this test are more likely to reference the written test procedure than the associated certification procedure, so placing the requirement within the test procedure helps improve clarity.

Existing Section 9 – Determination of Compliance and Violation. Proposal is to move this section to Section 4 of CP-204. This language has been removed from the test procedure and placed into the certification procedure for clarity and consistency. ARB's general practice is that the test procedure explains or describes the test and the certification procedure sets forth the pass/fail criteria and explains the implication of test results.

Proposed Section 9- Calculating Results. Proposal is to remove the performance standard of Internal Vapor Valve from this test procedure and instead list it in CP-204.

This will improve clarity and consistency. ARB's general practice is that the test procedure explains or describes the test and the certification procedure sets forth the pass/fail criteria and explains the implication of test results. Other minor non-substantive editorial modifications have been made to improve clarity.

Existing Section 10 – Quality Assurance/Quality Control (QA/QC). This section is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Proposed Section 10 – Alternate Procedures. This section has been amended to remove instructions for obtaining ARB approval for the use of other alternative test methods. The process for obtaining approval for other equivalent test methods has been added to section 5 of CP-204, which improves clarity and is consistent with the format that ARB uses in other similar certification and test procedures.

Existing Section 11 – Recording Data. This section is proposed for deletion since all data must be submitted electronically. Online submittal of test results has been available since 2009, and ARB staff has worked with cargo tank operators over the past several years to encourage its use statewide. Since 2011, all cargo tank operators in California have been submitting information online voluntarily. By requiring electronic submittal of data, staff intends to promote continued statewide consistency and continued use of the existing online data submittal system.

Proposed Section 11 – Example Figures and Tables. The proposal is to move Example Figures and Tables from existing Section 16 to Section 11 to account for the removal of previous sections. The test data sheet, previously contained in Figure 3, has been deleted to allow more flexibility in the way that data is collected and recorded in the field. TP-204.2 is used primarily by ARB staff and air district inspectors, and each regulatory agency prefers to collect and maintain test data in their own particular format.

Existing Section 12 – Calculating Results. The proposal is to move Calculating Results from Section 12 to Section 9 to account for the removal of previous sections.

Existing Section 13 – Reporting Results. The proposal is to delete this section since the form previously found in Figure 3 has been deleted. The test data sheet has been deleted in order to allow more flexibility in the way that data is collected and recorded in the field. TP-204.2 is used primarily by ARB staff and air district inspectors, and each regulatory agency prefers to collect and maintain test data in their own particular format.

Existing Section 14 – Alternate Test Procedure. The proposal is to move Alternate Test Procedures from Section 14 to proposed Section 10. This renumbering is necessary to account for the removal of previous sections.

Existing Section 15 – References. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 16 - Example Figures, Forms, and Tables. The proposal is to move Example Figures, Forms, and Tables from Section 16 to Section 11. This renumbering is necessary to account for the removal of previous sections.

H) Revisions to TP-204.3

The following is a summary of the specific regulatory amendments that are proposed for TP-204.3. The full proposed regulatory language shown in strike and add format are included in Appendix H.

Section 1 – Applicability. This section was revised to include a minor editorial change by correcting the title of D-200, Definition for Vapor Recovery Procedures. Other proposed changes include making it clear that this test procedure is used to determine leak tightness from cargo tanks. References to not superseding air district requirements were deleted since state law prohibits districts from establishing more stringent performance standards for cargo tanks. All references to determinations of compliance and violation and modifications were deleted. The last two items are now included in CP-204, which improves clarity and is consistent with the format that ARB uses in other similar certification and test procedures.

Section 2 – Principle and Summary of Test Procedure. This section was rewritten to state that a portable instrument is used to detect leaks and the procedure is used to locate and classify leaks but cannot be used as a direct measurement of emissions. References to U.S. EPA Method 21 were deleted. The proposed language more accurately summarizes the test procedure, and is therefore more appropriate for the title heading of this section.

Section 3 – Biases and Interferences. Minor non-substantial editorial modifications are proposed to improve clarity.

Existing Section 4 – Sensitivity, Range, and Precision. This section is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Proposed Section 4 – Equipment and Supplies. The proposal is to move Equipment and Supplies from Section 5 to Section 4. This renumbering is necessary to account for the removal of previous sections. Other minor non-substantial editorial modifications are made in this section to improve clarity and use terminology that is consistent with other similar ARB certification and test procedures.

Existing Section 5 - Equipment and Supplies. The Equipment and Supplies would be moved to Section 4. This renumbering is necessary to account for the removal of previous sections.

Proposed Section 5 – Calibration Procedure. Proposal is to move Calibration Procedure from Section 6. This renumbering is necessary to account for the removal of previous sections.

Existing Section 6 – Calibration Procedure. Proposal is to move Calibration Procedure to Section 5. This renumbering is necessary to account for the removal of previous sections.

Proposed Section 6 – Test Procedure. Proposal is to move Test Procedure from Section 8 to Section 6. This renumbering is necessary to account for the removal of previous sections.

Existing Section 7- Pre Test Protocol. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Proposed Section 7 – Alternate Procedures. Proposal is to maintain U.S. EPA Method 21 as equivalent to TP-204.3 with the exception that when using Method 21 the probe distance must conform to section 6.3.1 of TP-204.3. Allowing the use of the U.S. EPA test procedure as an alternative to TP 204.3 provides flexibility and helps to harmonize California's requirements with federal requirements. U.S. EPA Method 21 does not specify a distance that the probe should be held from a potential leak point during testing. To provide clarity and promote consistency between the U.S. EPA method and TP-204.3, staff has proposed that the probe distance used when conducting U.S. EPA method must be the same as specified in section 6.3.1 of TP-204.3. This section has also been amended to remove instructions for obtaining ARB approval for the use of other alternative test methods. The process for obtaining approval for other alternative test methods has been added to section 5 of CP-204, which improves clarity and is consistent with the format that ARB uses in other similar certification and test procedures.

Existing Section 8 –Test Procedure. Proposal is to move Test Procedure to Section 6. This renumbering is necessary to account for the removal of previous sections.

Proposed Section 8 – Figures. Proposal is to move Figures from Section 16 to Section 8. This renumbering is necessary to account for the removal of previous sections.

Existing Section 9 – Determinations of Compliance and Violation. Proposal is to delete Section 9 from TP-204.3 and add comparable language to Section 4 of CP-204. This will improve clarity and consistency. ARB's general practice is that the test procedure explains or describes the test and the certification procedure sets forth the pass/fail criteria and explains the implication of test results.

Existing Section 10 – Quality Assurance/Quality Control (QA/QC). This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 11 – Recording Data. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 12 – Calculating Results. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 13 – Reporting Results. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 14 – Alternative Test Procedures. Proposal is to move Alternative Test Procedures to Section 7 and delete Section 14. This renumbering is necessary to account for the removal of previous sections.

Existing Section 15 – References. This heading is proposed for deletion since it contains no information. Removing this section shortens and simplifies the written test procedure.

Existing Section 16 – Figures. Proposal is to move Figures from Section 16 to Section 8 and delete Section 16. This renumbering is necessary to account for the removal of previous sections.

IX MAJOR ISSUES IDENTIFIED AND DISCUSSED

A) Revisions to TP-201.1

At the April 23, 2013 Public Workshop, ARB staff received a comment regarding proposed changes to TP-201.1, *Volumetric Efficiency for Phase I Vapor Recovery Systems*. The commenter expressed concern that ARB's proposal would result in a procedure that is less likely to detect minor inefficiencies in the Phase I system, and that only significant blockage of the vapor return line would result in failure. It was suggested that rather than eliminating the one-hour post-delivery vent volume monitoring (15 minutes, plus an additional 45 minutes if pressure is greater than 1 inch of water column), prior to the fuel transfer, ARB staff should establish a baseline vent volume flow rate for approximately one hour. Once the baseline is determined, it could then be deducted from the efficiency calculation equations, preventing the baseline vent volumes from biasing the results and penalizing the Phase I System being tested.

The proposed revisions to TP-201.1 do not alter the core principles of the current test procedure, so ARB staff does not agree with the comment that the proposed revisions would create a test procedure that will only result in failure when there is a significant blockage of the vapor return line. However, staff does agree that there is a benefit in quantifying baseline vent emission prior to testing. Staff had attempted this approach while examining previous AST efficiency testing failures and found that with the test equipment being utilized (flow meter, P/V vent valve, data logger, etc.) it was not always possible to measure and capture baseline emissions loss through the vent line. Although staff agrees with the suggestion that it would be beneficial to quantify baseline vent emissions prior to the fuel delivery, the current proposal was chosen due to technical limitations that make field measurement of those baseline vent emissions impractical.

X APPENDICES

A) Proposed Regulation Order to Adopt Amended Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities and Cargo Tanks
B) Regulatory Authority: Vapor Recovery Health and Safety Code Statutes
C) Proposed Amendments to TP-201.1: Volumetric Efficiency for Phase I Systems
D) Proposed Amendments to TP-206.2: Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks
E) Proposed Amendments to CP-204: Certification Procedure for Vapor Recovery Systems of Cargo Tanks
F) Proposed Amendments to TP-204.1: Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks
G) Proposed Amendments to TP-204.2: Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks
H) Proposed Amendments to TP-204.3: Determination of Leak(s)
I) Appropriateness of Test Procedure TP-201.1, "Volumetric Efficiency for Phase I Systems," on Gasoline Dispensing Facilities Equipped with Aboveground Storage Tanks
J) Public Process for Development of the Proposed Amendments

APPENDIX A

Proposed Regulation Order to Adopt Amended Certification and Test Procedures for Vapor Recovery Systems at Gasoline Dispensing Facilities and Cargo Tanks

PROPOSED REGULATION ORDER

Note: ~~Strikeout~~ indicates deleted text; underline indicates inserted text.

Amend Section 94011, Article 1, Subchapter 8, Chapter 1, Division 3, Title 17 CCR to read:

§ 94011. Certification of Vapor Recovery Systems of Dispensing Facilities.

The certification of gasoline vapor recovery systems at dispensing facilities (service stations) shall be accomplished in accordance with the Air Resources Board's CP-201, "Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities" which is herein incorporated by reference. (Adopted: December 9, 1975, as last amended January 9, 2013).

The following test procedures (TP) cited in CP-201 are also incorporated by reference.

TP-201.1 – "Volumetric Efficiency for Phase I Systems" (Adopted: April 12, 1996, as last amended ~~July 26, 2012~~ [*Insert amendment date*])

TP-201.1A – "Emission Factor For Phase I Systems at Dispensing Facilities" (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.1B – "Static Torque of Rotatable Phase I Adaptors" (Adopted: July 3, 2002, as last amended October 8, 2003)

TP-201.1C – "Leak Rate of Drop Tube/Drain Valve Assembly" (Adopted: July 3, 2002, as last amended October 8, 2003)

TP-201.1D – "Leak Rate of Drop Tube Overfill Prevention Devices" (Adopted: February 1, 2001, as last amended October 8, 2003)

TP-201.1E – "Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves" (Adopted: October 8, 2003)

TP-201.1E CERT– "Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves" (Adopted: May 25, 2006)

TP-201.2 – "Efficiency and Emission Factor for Phase II Systems" (Adopted: April 12, 1996, as last amended July 26, 2012)

TP-201.2A – "Determination of Vehicle Matrix for Phase II Systems" (Adopted: April 12, 1996, as last amended July 26, 2012)

TP-201.2B – "Flow and Pressure Measurement of Vapor Recovery Equipment" (Adopted: April 12, 1996, as last amended October 8, 2003)

TP-201.2C – "Spillage from Phase II Systems" (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.2D – "Post-Fueling Drips from Nozzle Spouts" (Adopted: February 1, 2001, as last amended October 8, 2003)

TP-201.2E – "Gasoline Liquid Retention in Nozzles and Hoses" (Adopted: February 1, 2001)

TP-201.2F – "Pressure-Related Fugitive Emissions" (Adopted: February 1, 2001, as last amended October 8, 2003)

TP-201.2G – "Bend Radius Determination for Underground Storage Tank Vapor Recovery Components" (Adopted: October 8, 2003, as last amended May 25, 2006)

TP-201.2H – "Determination of Hazardous Air Pollutants from Vapor Recovery Processors" (Adopted: February 1, 2001)

TP-201.2I – "Test Procedure for In-Station Diagnostic Systems" (Adopted: October 8, 2003, as last amended July 26, 2012)

TP-201.2J – "Pressure Drop Bench Testing of Vapor Recovery Components" (Adopted: October 8, 2003, as last amended July 26, 2012)

TP-201.3 – "Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities" (Adopted: April 12, 1996, as last amended July 26, 2012)

TP-201.3A – "Determination of 5 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities" (Adopted: April 12, 1996)

TP-201.3B - "Determination of Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities with Above-Ground Storage Tanks" (Adopted: April 12, 1996)

TP-201.3C – "Determination of Vapor Piping Connections to Underground Gasoline Storage Tanks (Tie-Tank Test)" (Adopted: March 17, 1999)

TP-201.4 – "Dynamic Back Pressure" (Adopted: April 12, 1996, as last amended July 3, 2002)

TP-201.5 – "Air to Liquid Volume Ratio" (Adopted: April 12, 1996, as last amended February 1, 2001)

TP-201.6 – "Determination of Liquid Removal of Phase II Vapor Recovery Systems of Dispensing Facilities" (Adopted: April 12, 1996, as last amended April 28, 2000)

TP-201.6C – "Compliance Determination of Liquid Removal Rate" (Adopted: July 3, 2002)

TP-201.7 – "Continuous Pressure Monitoring" (Adopted: October 8, 2003)

UL 330 (7th ed) – "Underwriters Laboratories' Standard for Hose and Hose Assemblies for Dispensing Flammable Liquids, December 16, 2009.

Note: Authority cited: Sections 25290.1.2, 39600, 39601, 39607 and 41954, Health and Safety Code. Reference: Sections 25290.1.2, 39515, 41952, 41954, 41956.1, 41959, 41960 and 41960.2, Health and Safety Code.

Amend Section 94014, Article 1, Subchapter 8, Chapter 1, Division 3, Title 17 CCR to read:

§ 94014. Certification of Vapor Recovery Systems for Cargo Tanks.

The certification of gasoline vapor recovery systems for cargo tanks shall be accomplished in accordance with the Air Resources Board's CP-204 "Certification Procedure for Vapor Recovery Systems of Cargo Tanks" which is incorporated herein by reference. (Adopted: April 18, 1977, as last amended ~~March 17, 1999~~[*insert amendment date*]).

The following test procedures (TP) cited in CP-204 are also incorporated by reference.

TP-204.1 - "Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks" (Adopted: April 12, 1996, as last amended ~~March 17, 1999~~[*insert amendment date*])

TP-204.2 - "Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks" (Adopted: April 12, 1996, as last amended ~~March 17, 1999~~[*insert amendment date*])

TP-204.3 - "Determination of Leak(s)" (Adopted: April 12, 1996, as last amended ~~March 17, 1999~~[*insert amendment date*]).

Note: Authority cited: Sections 39600, 39601, 39607 41954, and 41962, Health and Safety Code. Reference: Sections 39515, 39516, 39607, 41954 and 41962, Health and Safety Code.

Amend Section 94016, Article 1, Subchapter 8, Chapter 1, Division 3, Title 17 CCR to read:

§ 94016. Certification of Vapor Recovery Systems at Gasoline Dispensing Facilities Using Aboveground Storage Tanks.

The certification of gasoline vapor recovery systems at dispensing facilities using aboveground storage tanks shall be accomplished in accordance with the Air Resources Board's CP-206, "Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities Using Aboveground Storage Tanks," adopted May 2, 2008, as last amended January 9, 2013, which is herein incorporated by reference.

The following test procedures (TP) cited in CP-206 are also incorporated by reference.

TP-206.1 - "Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems using Temperature Attenuation Factor at Gasoline Dispensing Facilities with Aboveground Storage Tanks" (Adopted: May 2, 2008)

TP-206.2 - "Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks" (Adopted: May 2, 2008, <u>as last amended [*insert amendment date*]</u>)

TP-206.3 - "Determination of Static Pressure Performance of Vapor Recovery Systems at Gasoline Dispensing Facilities with Aboveground Storage Tanks" (Adopted: May 2, 2008 as last amended on July 26, 2012).

The following certification and test procedures cited in certification procedure CP-206 and adopted in section 94011 by incorporation by reference are also incorporated by reference herein: CP-201, TP-201.1, TP-201.1A, TP-201.1B, TP-201.1C, TP-201.1D, TP-201.1E, TP-201.1E CERT, TP-201.2, TP-201.2A, TP-201.2B, TP-201.2C, TP-201.2D, TP-201.2E, TP-201.2G, TP-201.2H, TP-201.2I, TP-201.2J, TP-201.4, TP-201.5, TP-201.6, TP-201.7, and UL-330 (7th Ed).

Note: Authority cited: Sections 39600, 39601, 39607, and 41954, Health and Safety Code. Reference: Sections 39515, 39605, 41954, 41956.1, 41959, 41960, and 41960.2, Health and Safety Code.

APPENDIX B

Regulatory Authority: Vapor Recovery Health and Safety Code Statutes

H&S 41950 Vapor Recovery Systems for Stationary Gas Tanks

41950. (a) Except as provided in subdivisions (b) and (e), no person shall install or maintain any stationary gasoline tank with a capacity of 250 gallons or more which is not equipped for loading through a permanent submerged fill pipe, unless such tank is a pressure tank as described in Section 41951, or is equipped with a vapor recovery system as described in Section 41952 or with a floating roof as described in Section 41953, or unless such tank is equipped with other apparatus of equal efficiency which has been approved by the air pollution control officer in whose district the tank is located.

(b) Subdivision (a) shall not apply to any stationary tanks installed prior to December 31, 1970.

(c) For the purpose of this section, "gasoline" means any petroleum distillate having a Reid vapor pressure of four pounds or greater.

(d) For the purpose of this section, "submerged fill pipe" means any fill pipe which has its discharge opening entirely submerged when the liquid level is six inches above the bottom of the tank.
"Submerged fill pipe," when applied to a tank which is loaded from the side, means any fill pipe which has its discharge opening entirely submerged when the liquid level is 18 inches above the bottom of the tank.

(e) Subdivision (a) shall not apply to any stationary tank which is used primarily for the fueling of implements of husbandry.

(Added by Stats. 1975, Ch. 957.)

H&S 41951 Definition of Pressure Tank

41951. A "pressure tank" is a tank which maintains working pressure sufficient at all times to prevent hydrocarbon vapor or gas loss to the atmosphere.

(Added by Stats. 1975, Ch. 957.)

H&S 41952 Definition of Vapor Recovery System

41952. A "vapor recovery system" consists of a vapor gathering system capable of collecting the hydrocarbon vapors and gases discharged and a vapor disposal system capable of processing such hydrocarbon vapors and gases so as to prevent their emission into the atmosphere, with all tank gauging and sampling devices gastight except when gauging or sampling is taking place.

(Added by Stats. 1975, Ch. 957.)

H&S 41953 Definition of Floating Roof

41953. A "floating roof" consists of a pontoon-type or double-deck-type roof, resting on the surface of the liquid contents and equipped with a closure seal, or seals, to close the space between the roof edge and tank wall. The control equipment required by this section shall not be used if the gasoline or petroleum distillate has a vapor pressure of 11.0 pounds per square inch absolute or greater under actual storage conditions. All tank gauging and sampling devices shall be gastight except when gauging or sampling is taking place.

(Added by Stats. 1975, Ch. 957.)

H&S 41954 ARB Shall Certify Vapor Recovery Systems

41954. (a) The state board shall adopt procedures for determining the compliance of any system designed for the control of gasoline vapor emissions during gasoline marketing operations, including storage and transfer operations, with performance standards that are reasonable and necessary to achieve or maintain any applicable ambient air quality standard.

(b) The state board shall, after a public hearing, adopt additional performance standards that are reasonable and necessary to ensure that systems for the control of gasoline vapors resulting from motor vehicle fueling operations do not cause excessive gasoline liquid spillage and excessive evaporative emissions from liquid retained in the dispensing nozzle or vapor return hose between refueling events, when used in a proper manner. To the maximum extent practicable, the additional performance standards shall allow flexibility in the design of gasoline vapor recovery systems and their components.

(c) (1) The state board shall certify, in cooperation with the districts, only those gasoline vapor control systems that it determines will meet the following requirements, if properly installed and maintained:

(A) The systems will meet the requirements of subdivision (a).

(B) With respect to any system designed to control gasoline vapors during vehicle refueling, that system, based on an engineering evaluation of that system's component qualities, design, and test performance, can be expected, with a high degree of certainty, to comply with that system's certification conditions over the warranty period specified by the board.

(C) With respect to any system designed to control gasoline vapors during vehicle refueling, that system shall be compatible with vehicles equipped with onboard refueling vapor recovery (ORVR) systems.

(2) The state board shall enumerate the specifications used for issuing the certification. After a system has been certified, if circumstances beyond the control of the state board cause the system to no longer meet the required specifications or standards, the state board shall revoke or modify the certification.

(d) The state board shall test, or contract for testing, gasoline vapor control systems for the purpose of determining whether those systems may be certified.

(e) The state board shall charge a reasonable fee for certification, not to exceed its actual costs there for. Payment of the fee shall be a condition of certification.

(f) No person shall offer for sale, sell, or install any new or rebuilt gasoline vapor control system, or any component of the system, unless the system or component has been certified by the state board and is clearly identified by a permanent identification of the certified manufacturer or rebuilder.

(g) (1) Except as authorized by other provisions of law and except as provided in this subdivision, no district may adopt, after July 1, 1995, stricter procedures or performance standards than those adopted by the state board pursuant to subdivision (a), and no district may enforce any of those stricter procedures or performance standards.

(2) Any stricter procedures or performance standards shall not require the retrofitting, removal, or replacement of any existing system, which is installed and operating in compliance with applicable requirements, within four years from the effective date of those procedures or performance standards, except that existing requirements for retrofitting, removal, or replacement of nozzles with nozzles containing vapor-check valves may be enforced commencing July 1, 1998.

(3) Any stricter procedures or performance standards shall not be implemented until at least two systems meeting the stricter performance standards have been certified by the state board.

(4) If the certification of a gasoline vapor control system or a component thereof, is revoked or modified, no district shall require a currently installed system, or component thereof, to be removed for a period of four years from the date of revocation or modification.

(h) No district shall require the use of test procedures for testing the performance of a gasoline vapor control system unless those test procedures have been adopted by the state board or have been determined by the state board to be equivalent to those adopted by the state board, except that test procedures used by a district prior to January 1, 1996, may continue to be used until January 1, 1998, without state board approval.

(i) With respect to those vapor control systems subject to certification by the state board, there shall be no criminal or civil proceedings commenced or maintained for failure to comply with any statute, rule, or regulation requiring a specified vapor recovery efficiency if the vapor control equipment which has been installed to comply with applicable vapor recovery requirements meets both of the following requirements:

(1) Has been certified by the state board at an efficiency or emission factor required by applicable statutes, rules, or regulations.

(2) Is installed, operated, and maintained in accordance with the requirements set forth in the document certification and the instructions of the equipment manufacturer.

(Amended by Stats. 2000, Ch. 729, Sec. 14.)

References at the time of publication (see page iii):

Regulations:
17, CCR, Sections 94006, 94010, 94011,
94012, 94013, 94014, 94015, 94148, 94149, 94150, 94151, 94152, 94153,
94154, 94155, 94156, 94157, 94158, 94159, 94160, 94163

H&S 41955 Certification Required by Other Agencies

41955. Prior to state board certification of a gasoline vapor control system pursuant to Section 41954, the manufacturer of the system shall submit the system to, or, if appropriate, the components of the system as requested by, the Division of Measurement Standards of the Department of Food and Agriculture and the State Fire Marshal for their certification.

(Added by Stats. 1976, Ch. 1030.)

H&S 41956 Other Agencies to Adopt Rules for Certification

41956. (a) As soon as possible after the effective date of this section, the State Fire Marshal and the Division of Measurement Standards, after consulting with the state board, shall adopt rules and regulations for the certification of gasoline vapor control systems and components thereof.

(b) The State Fire Marshal shall be the only agency responsible for determining whether any component or system creates a fire hazard. The division shall be the only agency responsible for the measurement accuracy aspects, including gasoline recirculation of any component or system.

(c) Within 120 days after the effective date of this subdivision, the Division of

Measurement Standards, shall, after public hearing, adopt rules and regulations containing additional performance standards and standardized certification and compliance test procedures which are reasonable and necessary to prevent gasoline recirculation in systems for the control of gasoline vapors resulting from motor vehicle fueling operations.

(Amended by Stats. 1981, Ch. 902.)

H&S 41956.1 Revision of Standards for Vapor Recovery Systems

41956.1. (a) Whenever the state board, the Division of Measurement Standards of the Department of Food and Agriculture, or the State Fire Marshal revises performance or certification standards or revokes a certification, any systems or any system components certified under procedures in effect prior to the adoption of revised standards or the revocation of the certification and installed prior to the effective date of the revised standards or revocation may continue to be used in gasoline marketing operations for a period of four years after the effective date of the revised standards or the revocation of the certification. However, all necessary repair or replacement parts or components shall be certified.

(b) Notwithstanding subdivision (a), whenever the State Fire Marshal determines that a system or a system component creates a hazard to public health and welfare, the State Fire Marshal may prevent use of the particular system or component.

(c) Notwithstanding subdivision (a), the Division of Measurement Standards may prohibit the use of any system or any system component if it determines on the basis of test procedures adopted pursuant to subdivision (c) of Section 41956, that use of the system or component will result in gasoline recirculation.

(Amended by Stats. 1996, Ch. 426, Sec. 2.)

References at the time of publication (see page iii):

Regulations: 17, CCR, Section 94011

H&S 41957 Division of Industrial Safety Responsibilities

41957. The Division of Occupational Safety and Health of the Department of Industrial Relations is the only agency responsible for determining whether any gasoline vapor control system, or component thereof, creates a safety hazard other than a fire hazard. If the division determines that a system, or component thereof, creates a safety hazard other than a fire hazard, that system or component may not be used until the division has certified that the system or component, as the case may be, does not create that hazard.

The division, in consultation with the state board, shall adopt the necessary rules and regulations for the certification if the certification is required.

(Amended by Stats. 1981, Ch. 714.)

H&S 41958 Rules Shall Allow for Flexibility in Design

41958. To the maximum extent practicable, the rules and regulations adopted pursuant to Sections 41956 and 41957 shall allow flexibility in the design of gasoline vapor control systems and their components. The rules and regulations shall set forth the performance standards as to safety and measurement accuracy and the minimum procedures to be followed in testing the system or component for compliance with the performance standards.

The State Fire Marshal, the Division of Occupational Safety and Health, and the Division of Measurement Standards shall certify any system or component which complies with their adopted rules and regulations. Any one of the state agencies may certify a system or component on the basis of results of tests performed by any entity retained by the manufacturer of the system or component or by the state agency. The requirements for the certification of a system or component shall not require that it be tested, approved, or listed by any private entity, except that certification testing regarding recirculation of gasoline shall include testing by an independent testing laboratory.

(Amended by Stats. 1982, Ch. 466, Sec. 72.)

H&S 41959 Certification Testing

41959. Certification testing of gasoline vapor control systems and their components by the state board, the State Fire Marshal, the Division of Measurement Standards, and the Division of Occupational Safety and Health may be conducted simultaneously.

(Amended by Stats. 1981, Ch. 714.)

References at the time of publication (see page iii):

Regulations: 17, CCR, Sections 94010, 94011, 94012, 94013

H&S 41960 Certification by State Agencies Sufficient

41960. (a) Certification of a gasoline vapor recovery system for safety and measurement accuracy by the State Fire Marshal and the Division of Measurement Standards and, if necessary, by the Division of Occupational Safety and Health shall permit its installation wherever required in the state, if the system is also certified by the state board.

(b) Except as otherwise provided in subdivision (g) of Section 41954, no local or regional authority shall prohibit the installation of a certified system without obtaining concurrence from the state agency responsible for the aspects of the system which the local or regional authority disapproves.

(Amended by Stats. 1996, Ch. 426, Sec. 3.)

References at the time of publication (see page iii):

Regulations: 17, CCR, Sections 94011, 94012, 94013

H&S 41960.1 Operation in Accordance with Standards

41960.1. (a) All vapor control systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be operated in accordance with the applicable standards established by the State Fire Marshal or the Division of Measurement Standards pursuant to Sections 41956 to 41958, inclusive.

(b) When a sealer or any authorized employee of the Division of Measurement Standards determines, on the basis of applicable test procedures of the division, adopted after public hearing, that an individual system or component for the control of gasoline vapors resulting from motor vehicle fueling operations does not meet the applicable standards established by the Division of Measurement Standards, he or she shall take the appropriate action specified in Section 12506 of the Business and Professions Code.

(c) When a deputy State Fire Marshal or any authorized employee of a fire district or local or regional firefighting agency determines that a component of a system for the control of gasoline vapors resulting from motor vehicle fueling operations does not meet the applicable standards established by the State Fire Marshal, he or she shall mark the component "out of order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and either the component has been inspected by a representative of the agency employing the person originally marking the component, or the person using or permitting use of the component has been expressly authorized by the agency to use the component pending reinspection.

(Added by Stats. 1981, Ch. 902.)

H&S 41960.2 Maintenance of Installed Systems

41960.2. (a) All installed systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be maintained in good working order in accordance with the manufacturer' s specifications of the system certified pursuant to Section 41954.

(b) Whenever a gasoline vapor recovery control system is repaired or rebuilt by someone other than the original manufacturer or its authorized representative, the person shall permanently affix a plate to the vapor recovery control system that identifies the repairer or rebuilder and specifies that only certified equipment was used. In addition, a rebuilder of a vapor control system shall remove any identification of the original manufacturer if the removal does not affect the continued safety or performance of the vapor control system.

(c) (1) The executive officer of the state board shall identify and list equipment defects in systems for the control of gasoline vapors resulting from motor vehicle fueling operations that substantially impair the effectiveness of the systems in reducing air contaminants. The defects shall be identified and listed for each certified system and shall be specified in the applicable certification documents for each system.

(2) On or before January 1, 2001, and at least once every three years thereafter, the list required to be prepared pursuant to paragraph (1) shall be reviewed by the executive officer at a public workshop to determine whether the list requires an update to reflect changes in equipment technology or performance.

(3) Notwithstanding the timeframes for the executive officer's review of the list, as specified in paragraph (2), the executive officer may initiate a public review of the list upon a written request that demonstrates, to the satisfaction of the executive officer, the need for such a review. If the executive officer determines that an update is required, the update shall be completed no later than 12 months after the date of the determination.

(d) When a district determines that a component contains a defect specified pursuant to subdivision (c), the district shall mark the component "Out of Order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and the district has reinspected the component or has authorized use of the component pending reinspection.

(e) Where a district determines that a component is not in good working order but does not contain a defect specified pursuant to subdivision (c), the district shall provide the operator with a notice specifying the basis on which the component is not in good working
order. If, within seven days, the operator provides the district with adequate evidence that the component is in good working order, the operator shall not be subject to liability under this division.

(Amended by Stats. 1999, Ch. 501, Sec. 1.)

References at the time of publication (see page iii):

Regulations: 17, CCR, Sections 94006, 94010, 94011

H&S 41960.3 Telephone Number for Reporting Problems

41960.3. (a) Each district which requires the installation of systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall establish a toll free telephone number for use by the public in reporting problems experienced with the systems. Districts within an air basin or adjacent air basin may enter into a cooperative program to implement this requirement. All complaints received by a district shall be recorded on a standardized form which shall be established by the state board, in consultation with districts, the State Fire Marshal, and the Division of Measurement Standards in the Department of Food and Agriculture. The operating instructions required by Section 41960.4 shall be posted at all service stations at which systems for the control of gasoline vapors resulting from motor vehicle fueling operations are installed and shall include a prominent display of the toll free telephone number for complaints in the district in which the station is located.

(b) Upon receipt of each complaint, the district shall diligently either investigate the complaint or refer the complaint for investigation by the state or local agency which properly has jurisdiction over the primary subject of the complaint. When the investigation has been completed, the investigating agency shall take such remedial action as is appropriate and shall advise the complainant of the findings and disposition of the investigation. A copy of the complaint and response to the complaint shall be forwarded to the state board.

(Amended by Stats. 1986, Ch. 194, Sec. 1.)

H&S 41960.4 Operating Instructions

41960.4. The operator of each service station utilizing a system for the control of gasoline vapors resulting from motor vehicle fueling operations shall conspicuously post operating instructions for the system in the gasoline dispensing area. The instructions shall clearly describe how to fuel vehicles correctly with vapor recovery nozzles utilized at the station and shall include a warning that repeated attempts to continue dispensing, after the system having indicated that the vehicle fuel tank is full, may result in spillage or recirculation of gasoline.

(Added by Stats. 1981, Ch. 902.)

H&S 41960.5 Nozzle Size Requirements

41960.5. (a) No retailer, as defined in Section 20999 of the Business and Professions Code, shall allow the operation of any gasoline pump from which leaded gasoline is dispensed, or which is labeled as providing leaded gasoline, unless the pump is equipped with a nozzle spout meeting the required specifications for leaded gasoline nozzle spouts set forth in Title 40, Code of Federal Regulations, Section 80.22(f)(1).

(b) For the purpose of this section, "leaded gasoline" means gasoline which is produced with the use of any lead additive or which contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon.

(Added by Stats. 1987, Ch. 592, Sec. 2.)

H&S 41960.6 Fuel Pump Nozzles

41960.6. (a) No retailer, as defined in subdivision (g) of Section 20999 of the Business and Professions Code, shall, on or after July 1, 1992, allow the operation of a pump, including any pump owned or operated by the state, or any county, city and county, or city, equipped with a nozzle from which gasoline or diesel fuel is dispensed, unless the nozzle is equipped with an operating hold open latch. Any hold open latch determined to be inoperative by the local fire marshal or district official shall be repaired or replaced by the retailer, within 48 hours after notification to the retailer of that determination, to avoid any applicable penalty or fine.

(b) For purposes of this section, a "hold open latch" means any device which is an integral part of the nozzle and is manufactured specifically for the purpose of dispensing fuel without requiring the consumer's physical contact with the nozzle.

(c) Subdivision (a) does not apply to nozzles at facilities which are primarily in operation to refuel marine vessels or aircraft.

(d) Nothing in this section shall affect the current authority of any local fire marshal to establish and maintain fire safety provisions for his or her jurisdiction.

(Added by Stats. 1991, Ch. 468, Sec. 2.)

H&S 41961 Fees for Certification

41961. The State Fire Marshal, the Division of Measurement Standards, and the Division of Occupational Safety and Health may charge a reasonable fee for certification of a gasoline vapor control system or a component thereof, not to exceed their respective estimated costs therefor. Payment of the fee may be made a condition of certification. All money collected by the State Fire Marshal pursuant to this section shall be deposited in the State Fire Marshal Licensing and Certification Fund established pursuant to Section 13137, and shall be available to the State Fire Marshal upon appropriation by the Legislature to carry out the purposes of this article.

(Amended by Stats. 1992, Ch. 306, Sec. 5. Effective January 1, 1993.
Operative July 1, 1993, by Sec. 6 of Ch. 306.)

H&S 41962 Vapor Recovery Systems on Cargo Tank Vehicles

41962. (a) Notwithstanding Section 34002 of the Vehicle Code, the state board shall adopt test procedures to determine the compliance of vapor recovery systems of cargo tanks on tank vehicles used to transport gasoline with vapor emission standards which are reasonable and necessary to achieve or maintain any applicable ambient air quality standard. The performance standards and test procedures adopted by the state board shall be consistent with the regulations adopted by the Commissioner of the California Highway Patrol and the State Fire Marshal pursuant to Division 14.7 (commencing with Section 34001) of the Vehicle Code.

(b) The state board may test, or contract for testing, the vapor recovery system of any cargo tank of any tank vehicle used to transport gasoline. The state board shall certify the cargo tank vapor recovery system upon its determination that the system, if properly installed and maintained, will meet the requirements of subdivision (a). The state board shall enumerate the specifications used for issuing such certification. After a cargo tank vapor recovery system has been certified, if circumstances beyond control of the state board cause the system to no longer meet the required specifications, the certification may be revoked or modified.

(c) Upon verification of certification pursuant to subdivision (b), which shall be done annually, the state board shall send a verified copy of the certification to the registered owner of the tank vehicle, which copy shall be retained in the tank vehicle as evidence of certification of its vapor recovery system. For each system certified, the state board shall issue a nontransferable and nonremovable decal to be placed on the cargo tank where the decal can be readily seen.

(d) With respect to any tank vehicle operated within a district, the state board, upon request of the district, shall send to the district, free of charge, a certified copy of the certification and test results of any cargo tank vapor recovery system on the tank vehicle.

(e) The state board may contract with the Department of the California Highway Patrol to carry out the responsibilities imposed by subdivisions (b), (c), and (d).

(f) The state board shall charge a reasonable fee for certification, not to exceed its estimated costs therefor. Payment of the fee shall be a condition of certification. The fees may be collected by the Department of the California Highway Patrol and deposited in the Motor Vehicle Account in the State Transportation Fund. The Department of the California Highway Patrol shall transfer to the Air Pollution Control Fund the amount of those fees necessary to reimburse the state board for the costs of administering the certification program.

(g) No person shall operate, or allow the operation of, a tank vehicle transporting gasoline and required to have a vapor recovery system, unless the system thereon has been certified by the state board and is installed and maintained in compliance with the state board's requirements for certification. Tank vehicles used exclusively to service gasoline storage tanks which are not required to have gasoline vapor controls are exempt from the certification requirement.

(h) Performance standards of any district for cargo tank vapor recovery systems on tank vehicles used to transport gasoline shall be identical with those adopted by the state board therefor and no district shall adopt test procedures for, or require certification of, cargo tank vapor recovery systems. No district may impose any fees on, or require any permit of, tank vehicles with vapor recovery systems. However, nothing in this section shall be construed to prohibit a district from inspecting and testing cargo tank vapor recovery systems on tank vehicles for the purposes of enforcing this section or any rule and regulation adopted thereunder that are applicable to such systems and to the loading and unloading of cargo tanks on tank vehicles.

(i) The Legislature hereby declares that the purposes of this section regarding cargo tank vapor recovery systems on tank vehicles are (1) to remove from the districts the authority to certify, except as specified in subdivision (b), such systems and to charge fees therefor, and (2) to grant such authority to the state board, which shall have the primary responsibility to assure that such systems are operated in compliance with its standards and procedures adopted pursuant to subdivision (a).

(Amended by Stats. 1982, Ch. 1255, Sec. 2. Operative July 1, 1983, or earlier, by Sec. 27.5 of Ch. 1255.)

References at the time of publication (see page iii):

Regulations: 17, CCR, Sections 94014, 94015

APPENDIX C

Proposed Amendments to TP-201.1: Volumetric Efficiency for Phase I Systems

California Environmental Protection Agency

Air Resources Board

{PROPOSED}

Vapor Recovery Test Procedure

TP-201.1

Volumetric Efficiency for Phase I Vapor Recovery Systems

Adopted: April 12, 1996
Amended: February 1, 2001
Amended: October 8, 2003
Amended: July 26, 2012
Amended: [insert amendment date]

{Note: The text is shown in ~~strikeout~~ to indicate that it is proposed for deletion and underline to indicate that it is proposed for addition. {Bracketed text] is not part of the proposed amendment}.

California Environmental Protection Agency
Air Resources Board

Vapor Recovery Test Procedure

TP-201.1

Volumetric Efficiency of Phase I Vapor Recovery Systems

Definitions common to all certification and test procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "ARB" or "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or ~~designate.~~designee.

1. PURPOSE AND APPLICABILITY

The purpose of this procedure is to quantify the transfer efficiency when a bulk gasoline delivery is made between a cargo tank and a storage tank ("storage tank" as used in this test procedure means either an underground storage tank or an aboveground storage tank) ~~is made~~. This procedure is used to determine compliance with Phase I performance standard specified in Certification Procedure 201 (CP-201) for underground storage tanks and Certification Procedure 206 (CP-206) for aboveground storage tanks.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

During a gasoline delivery, the cargo tank and gasoline dispensing facility (GDF) are instrumented with test equipment in order to determine the amount of vapor returned to the cargo tank and the amount of vapor discharged through the GDF vent pipe. From these parameters the Phase I volumetric efficiency is determined. This procedure provides for determining efficiency by way of either direct measurement or calculation.

If a Phase I system fails to meet the volumetric efficiency as required by CP-201 or CP-206, the cargo tank shall be tested for compliance with the daily standards established for cargo tanks as specified in CP-204 to determine if the failure can be attributed to the cargo tank.

3. BIASES AND INTERFERENCES

3.1 Any vapor leaks exceeding 100% of the Lower Explosive Limit (LEL) during the gasoline bulk delivery precludes the use of this method.

3.2 Gasoline cargo tanks exceeding the allowable daily pressure-decay standards as defined in CP-204 preclude the use of this method.

3.3 The presence of vapor leaks in the GDF, greater than the allowable leak decay limits specified in Section 3.2 of CP-201 and Section 4.2 of CP-206 preclude use of this method.

3.4 Unusually large cargo tank headspace volumes may cause low volumetric efficiency under certain conditions. Conversely, unusually small cargo tank headspace volumes may result in unusually high efficiency. During the Certification Process for a Phase I system, the cargo tank headspace volumes should be between 3.0 and 10.0 percent of the total cargo tank capacity prior to the delivery.

4. SENSITIVITY, PRECISION AND RANGE

4.1 Mechanical Pressure Gauge. The minimum readability shall be 1.00 inches H_2O with a maximum full-scale range of 30 inches H_2O and minimum accuracy of three percent of full scale. Pressure gauges with a higher resolution and higher accuracy may be deemed acceptable with prior approval by the Executive Officer.

4.2 Electronic Pressure Gauge. The maximum full-scale range of the device shall not exceed 20 inches H_2O with minimum sensitivity of 1.00 inches H_2O and minimum accuracy of 0.5 percent of full scale. Electronic pressure gauges shall be calibrated as described in Section 5 of this procedure.

4.3 Volume Meter, Vapor Return. Minimum full-scale range shall be 5,000 CFH with a maximum rated back pressure less than 1.10 in H_2O. The meter shall have an internal diameter of 3 inches, equal to that of a cargo tank vapor return hose.

4.4 Volume Meter, Vent Pipe. Minimum full-scale range shall be 800 CFH with a maximum rated back pressure less than 0.26 in H_2O. The meter shall have an internal diameter of 2 inches, equal to that of a GDF vent pipe.

4.5 Temperature. Maximum range of 0 to 150°F and accurate to within 2°F.

4.6 Barometric Pressure. Minimum accuracy of .08 inches of mercury (1.0 inch H_2O or 2.7 millibar).

5. EQUIPMENT

5.1 Vapor Return Meter(s). Use a volume meter with minimum specifications described in Section 4 to measure the amount of vapor returned to the cargo tank from the ~~underground~~ storage tank. The meter shall be equipped with a pressure gauge and temperature device as described in Section 4 on the inlet side. The meter shall be connected to the GDF in a fashion as to maintain intrinsic safety, see Figures 3, 4, and 5.

5.2 Vent Pipe Meter. Use a volume meter with minimum specifications described in Section 4 to measure the amount of vapor discharged through the vent pipe(s). The meter shall be equipped with a pressure gauge and temperature device as described in Section 4 on the inlet side. The meter shall be connected to the GDF in a fashion as to maintain intrinsic safety, see Figures 3, 4, and 5.

5.3 Cargo Tank Back Pressure Assembly. When testing Phase I efficiency without the use of volume meters, use OPW® 633-F and 633-D couplers, or equivalent, as shown in Figure 1. The assembly shall be equipped with a pressure gauge capable of measuring up to 30 inches H_2O back pressure at the gasoline cargo tank vapor coupler. Temperature may be measured at this point as an alternate to, or in addition to 5.1.

5.4 Storage Tank Pressure Assembly. When testing Phase I efficiency with the cargo tank back pressure assembly and the test facility uses a two point Phase I system with storage tanks manifolded aboveground or underground, use OPW® 634-B cap(s) or equivalent, equipped with a pressure gauge and center probe as shown in Figure 2

5.5 Combustible Gas Detector. Use a Bacharach Instrument Company Model 0023-7356®, or equivalent, to quantify any vapor leaks occurring during the gasoline bulk drop.

5.6 Barometer. Use a mercury, aneroid, or equivalent barometer with minimum specifications described in Section 4 to measure the barometric pressure during testing. The result shall be used to correct the volume of vapor returned or discharged.

5.7 Temperature. Use a minimum of three thermometers, Thermocouples™, or equivalent, to measure the vapor temperature at each meter. The results shall be used to correct the volume of vapor returned or discharged.

5.8 Stopwatch. Use a stopwatch accurate to within 0.1 seconds to time the delivery rate.

6. PRE-TEST PROCEDURES

6.1 The volume meter(s) shall be proofed against a standard reference meter prior to its initial use in the field or at intervals not to exceed 180 days. Calibration shall be performed at a minimum of three flowrates representing 25, 50 and 75 percent of rated capacity. An official statement of proofing is required.

6.2 The GDF shall be pre-tested for leak integrity as described in TP-201.3 for underground storage tanks and TP-206.3 for aboveground storage tanks at least 24 hours prior, and no longer than 7-days before testing. If a manifold is to be used at the vent pipe, the manifold shall be installed prior to conducting leak integrity testing.

6.3 No product dispensing shall occur for a minimum of 30 minutes prior to testing.

6.4 Taking caution to avoid venting the storage tank(s), connect the vent pipe meter(s) to the appropriate storage tank vent pipe(s) with the inlet side attached to the vent pipe. Use a metal ball valve if required to avoid venting. Attach the PV valve(s) to the outlet side of the meter(s) using a threaded nipple or equivalent. A temporary manifold may be constructed of steel where all vent pipes are connected to a single outlet and a single meter is installed.

6.5 Taking caution to avoid venting the storage tank(s), connect the vapor return meter(s) to the appropriate Phase I vapor connection(s) using metal fittings in order to maintain intrinsic safety. Use a metal vapor poppet if required to avoid venting. Connect the cargo tank vapor return hose to the outlet side of the meter. The meter will be in line between the Phase I connection and the cargo tank vapor return hose.

6.6 With no product dispensing, record the product grade, tank capacity, tank temperature and ambient conditions on the data sheet where provided. An example of the field data sheet is provided at the end of this procedure, see "Form 1".

6.7 If used, connect the Cargo Tank Back Pressure Assembly to the vapor coupler on the cargo tank. This assembly will be in line with the cargo tank vapor recovery hose. If the cargo tank vapor coupler is equipped with a poppet, use a pressure assembly with center probe.

6.8 If the cargo tank back pressure assembly is being used, install a Storage Tank Pressure Assembly on each Phase I vapor connection of those tanks not receiving product. During each bulk drop, record the maximum pressure in those tanks.

6.9 Record the product quantities to be delivered during each bulk drop. Also record the cargo tank CARB decal number and delivery company name on the data sheet (Form 1) where provided.

6.10 Stabilization. Open the corresponding cargo tank internal vapor valve(s) prior to delivering product. Once the vapor valve(s) is opened, wait a period of at least 1-minute to allow for pressure stabilization between the ~~UST~~ storage tank and cargo tank. For aboveground storage tanks, if the totalizer on the vent line vent meter has registered flow, wait until the system has stabilized and then clear the totalizer out before continuing on with the test.

7. TESTING

7.1 Record the stabilized, vapor return and vent pipe meter reading(s) on the data sheet where provided.

7.2 Start the gasoline bulk drop. Using the stopwatch, time each gasoline drop to determine the delivery rate for each compartment.

7.3 At minimum, record the following parameters for each gasoline bulk drop:

7.3.1 Initial and final meter readings for each vapor return meter

7.3.2 Average vapor return pressure

7.3.3 Average vapor return temperature

7.4 Repeat Sections 7.1 through 7.3 for each gasoline delivery. For deliveries using different Phase I connections (i.e., different storage tanks), relocate the vapor return meter(s) to the appropriate storage as specified in Section 6.7.

7.5 At conclusion of all gasoline deliveries, ensure that each of the cargo tank internal vapor valve is closed prior to disconnecting. Disconnect the vapor return meter(s) from the storage tank(s) taking care to avoid venting pressure. Disconnect the vapor return hose from the outlet side of the vapor return meter.

7.6 For underground storage tanks only, ~~C~~continue to monitor the vent pipe meter for a minimum of 15 minutes. If the ~~UST~~ underground storage tank pressure is less than 1.00 inches ~~H_2O~~WC, testing may be concluded. In the event that the station ~~UST~~ underground storage tank pressure is greater than 1.00 inches ~~H_2O~~WC, continue to monitor the vent pipe meter for an additional 45 minutes (1-hour total). These measurements are to be included in the Phase I efficiency calculation.

8. POST TEST PROCEDURES

8.1 At conclusion of the bulk delivery, ensure that each of the cargo tank internal vapor valves is closed prior to removing connections.

8.2 Remove the Cargo Tank Back Pressure Assembly, if used, from the cargo tank vapor return coupler.

8.3 Remove the Storage Tank Pressure Assembly, if used, from each storage tank where installed.

8.4 Remove the temporary manifold (if constructed) and disconnect all instrumentation from the vent pipe area. Replace the PV valve(s) on the vent pipe(s).

8.5 Verify the quantity of gasoline delivered to each storage tank using the facility tank gauge monitor or with use of a tank gauging stick.

8.6 The static pressure integrity of the vapor recovery system shall be verified as described in TP 201.3 for underground storage tanks and TP-206.3 for aboveground storage tanks as soon as possible, but not more than 48 hours, after the completion of this test. Failure of the static pressure integrity test shall invalidate the TP-201.1 test results unless the Executive Officer determines that the integrity failure did not result in any significant unmeasured emissions.

9. CALCULATING RESULTS

9.1 The measured volume of vapor passed through the vapor return to the cargo tank and vent pipe shall be corrected to standard conditions as follows:

$$\mathrm{Vcorr} = \left[\frac{(\mathrm{Vvi})(528)[Pb + \Delta h / 13.6]}{(\mathrm{T_{vi}})(29.92)} \right] \quad \textbf{Equation 9.1}$$

Where:

V_{corr}	=	Volume of vapor, corrected to 68°F (528°R) and 29.92" Hg, cubic feet
Pb	=	Barometric Pressure, inches Hg
Vvi	=	Uncorrected volume of vapor (raw meter reading), cubic feet
Tvi	=	Average or venting temperature at vent meter, °R
Δh	=	Average or venting pressure at vent meter, inches ~~H_2O~~WC
13.6	=	Conversion from Inches WC ~~of water per inch of~~ to inches mercury (Hg)
528	=	Standard ambient temperature, 68°F converted to degrees Rankine
29.92	=	Atmospheric pressure, inches Hg

9.2 If a cargo tank back pressure assembly was used to conduct testing, the volume of vapor returned to the cargo tank shall be calculated to standard conditions as follows:

$$V_t = \left[\frac{(0.1337)(G_t)\left(528\left(P_b + \frac{\Delta h}{13.6}\right)\right)}{(T_t)(29.92)} \right] \qquad \textbf{Equation 9.2}$$

Where:

V_t	=	Calculated volume of vapor returned to cargo tank corrected to 68°F (528°R) and 29.92" Hg
G_t	=	Volume of gasoline delivered, gallons
Δh	=	Final gauge pressure at cargo tank, ~~in. H_2O~~inches WC
T_t	=	Average temperature of vapor returned to cargo tank, °R
P_b	=	Barometric pressure, inches Hg
13.6	=	Conversion from Inches WC~~of water per inch of~~ to inches mercury (Hg)
528	=	Standard ambient temperature, 68°F converted to degrees Rankine
29.92	=	Atmospheric pressure, inches Hg

9.3 The collection efficiency shall be calculated as follows:

$$E = (100)\left[\frac{V_{returned} - V_{vent}}{V_{returned}} \right] \qquad \textbf{Equation 9.3}$$

Where:

E	=	Phase I Volumetric Efficiency, percent
$V_{returned}$	=	Vapor Return: From 9.1(V_{corr}) or 9.2(V_t)
V_{vent}	=	Corrected Vent Pipe Discharge: From 9.1(V_{corr})

10. REPORTING RESULTS

10.1 Results shall be reported as shown on the data sheets where provided. Districts may require the use of alternate data sheets provided they include, at minimum, the same parameters identified on Form 1.

11. ALTERNATE PROCEDURES

11.1 This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the ARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201 or Section 15 of Certification Procedure CP-206.

Test Date: ____________ Observations By: ____________

Facility Name: ____________

Address: ____________

System Description: ____________

Time: ________ Ambient Temp: ________ deg F Barometric: ________ Hpa

Wind: ________ mph Altitude: ________ ft Other: ____________

Cargo Tank Company: ____________

Cargo Tank Decal #(s): Truck: ____________ Trailer: ____________

Compartment #1

Pre-Delivery Observations

Initial Tank Product Temperature: ________ deg F

Tank Size: ________ gal

Amount To Deliver (BOL): ________ gal

Grade: ________ Loading Temp (BOL): ________

Initial Meter Reading: ________ ft^3

Delivery Observations

Tank Orientation: ________

Delivered Product Temperature: ________ deg F

Avg Vapor Return Pressure: ________ inWC

Avg Vapor Return Temp: ________ deg F

Fuel RVP (BOL): ________

Final Meter Reading: ________ ft^3

Compartment #2

Pre-Delivery Observations

Initial Tank Product Temperature ________ deg F

Tank Size: ________ gal

Amount To Deliver (BOL): ________ gal

Grade: ________ Loading Temp (BOL): ________

Initial Meter Reading: ________ ft^3

Delivery Observations

Tank Orientation: ________

Delivered Product Temperature: ________ deg F

Avg Vapor Return Pressure: ________ inWC

Avg Vapor Return Temp: ________ deg F

Fuel RVP (BOL): ________

Final Meter Reading: ________ ft^3

Compartment #3

Pre-Delivery Observations

Initial Tank Product Temperature: ________ deg F

Tank Size: ________ gal

Delivery Observations

Tank Orientation: ________

Delivered Product Temperature: ________ deg F

Avg Vapor Return Pressure: ________ inWC

Amount To Deliver (BOL): ______ gal
Grade: ______ Loading Temp (BOL): ______
Initial Meter Reading: ______ ft^3

Avg Vapor Return Temp: ______ deg F
Fuel RVP (BOL): ______
Final Meter Reading: ______ ft^3

Compartment #4

Pre-Delivery Observations

______ ______

Initial Tank Product Temperature: ______ deg F
Tank Size: ______ gal
Amount To Deliver (BOL): ______ gal
Grade: ______ Loading Temp (BOL): ______
Initial Meter Reading: ______ ft^3

Delivery Observations

Tank Orientation: ______
Delivered Product Temperature: ______ deg F
Avg Vapor Return Pressure: ______ inWC
Avg Vapor Return Temp: ______ deg F
Fuel RVP (BOL): ______
Final Meter Reading: ______ ft^3

Compartment #5

Pre-Delivery Observations

______ ______

Initial Tank Product Temperature: ______ deg F
Tank Size: ______ gal
Amount To Deliver (BOL): ______ gal
Grade: ______ Loading Temp (BOL): ______
Initial Meter Reading: ______ ft^3

Delivery Observations

Tank Orientation: ______
Delivered Product Temperature: ______ deg F
Avg Vapor Return Pressure: ______ inWC
Avg Vapor Return Temp: ______ deg F
Fuel RVP (BOL): ______
Final Meter Reading: ______ ft^3

Vent Pipe Discharge

Delivery Observations

Initial Vent Pressure: ______ inWC
Initial Vent Temperature: ______ deg F
Initial Meter Reading: ______ ft^3

Stack Venting Pressure: ______ inWC
Stack Venting Temperature: ______ deg F

Post Delivery Observations

Post Observation Time: ______

Remarks: ______

Final Vent Pressure: ______ inWC
Final Vent Temperature: ______ deg F
Final Meter Reading: ______ ft^3

Figure 1 - Cargo Tank Back Pressure Assembly

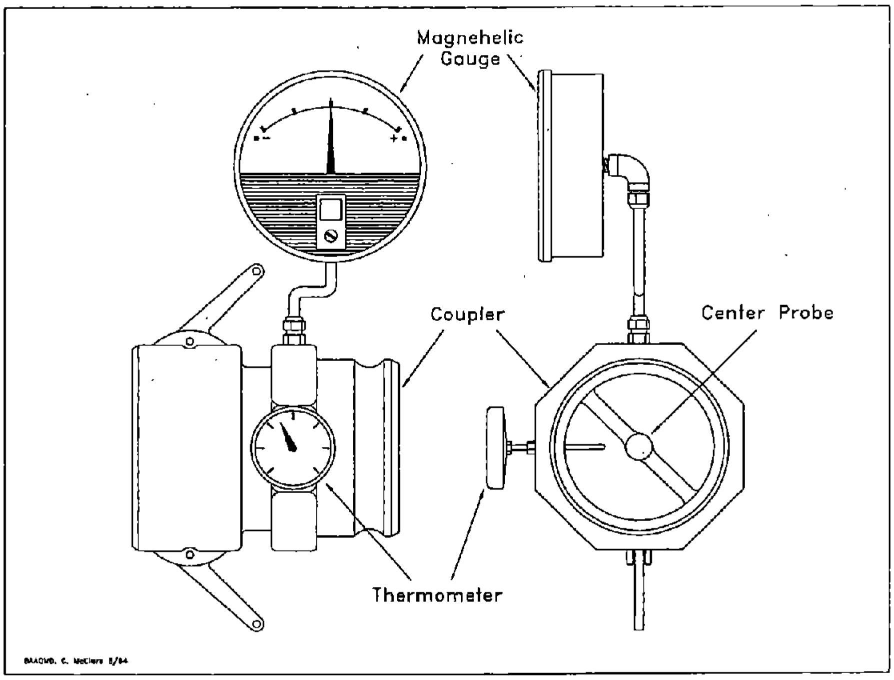


Figure 2 - Storage Tank Pressure Assembly

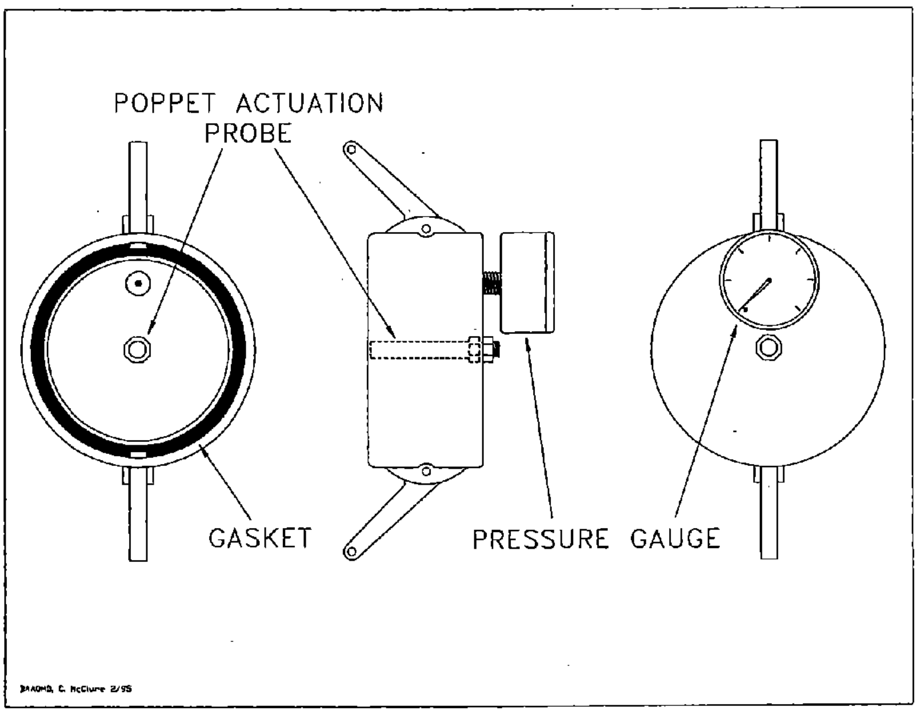


Figure 3 - Vent Pipe and Vapor Return Meter Arrangement for Phase I EVR Systems for Underground Storage Tanks

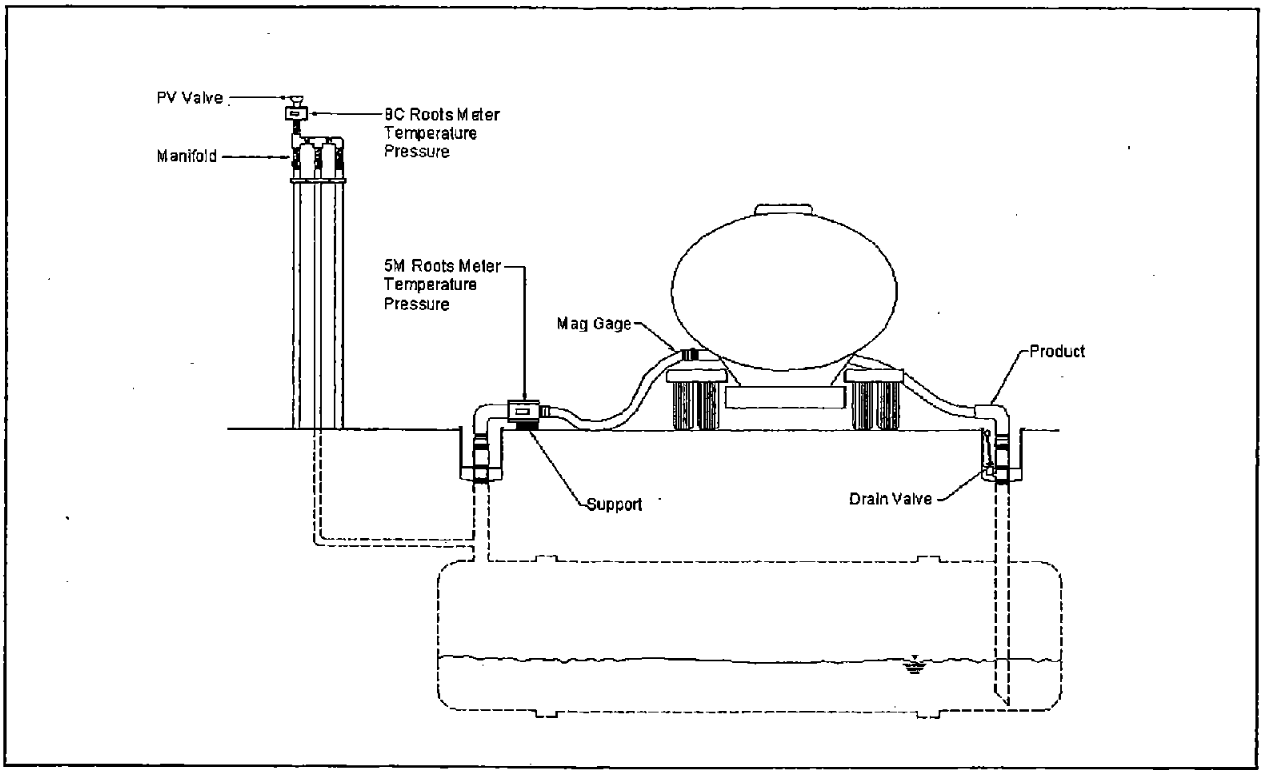


Figure 4 - Vent Pipe and Vapor Return Meter Arrangement for Remote Fill Phase I EVR Systems for Aboveground Storage Tanks

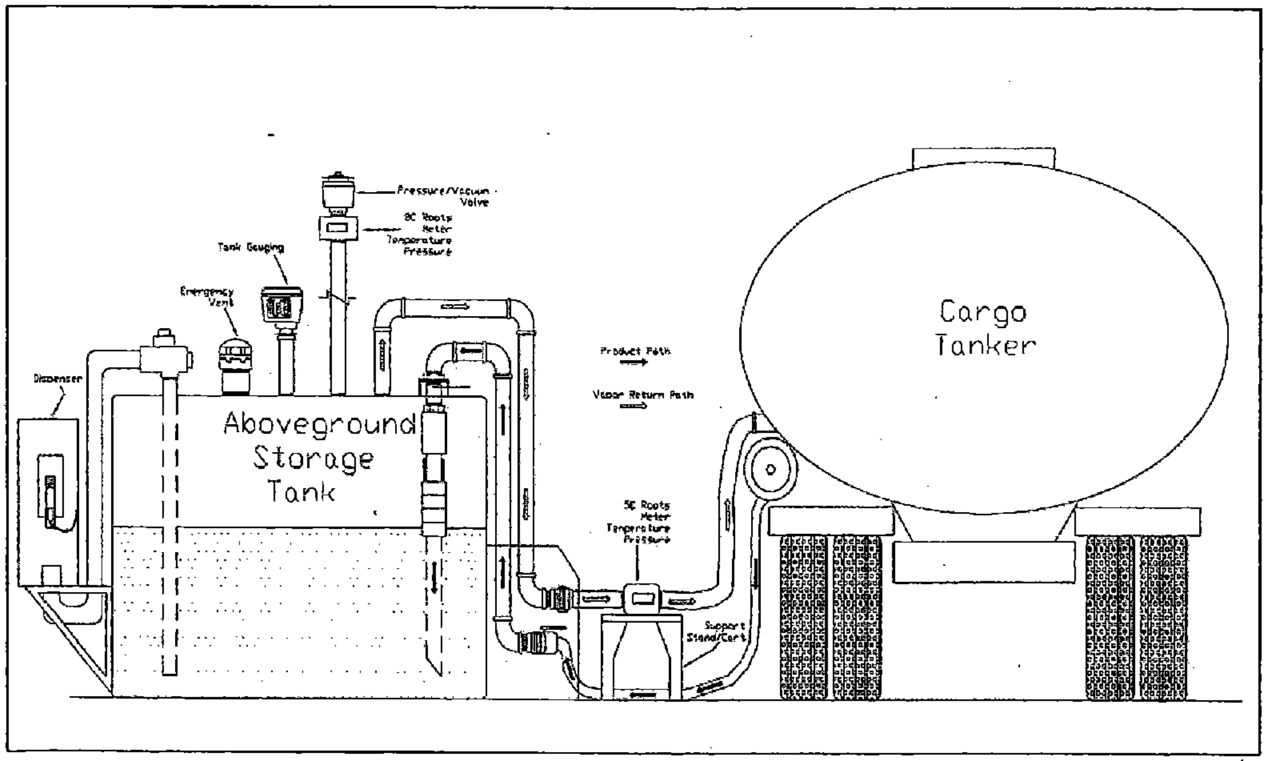


Figure 5 - Vent Pipe and Vapor Return Meter Arrangement for Direct Fill Phase I EVR Systems for Aboveground Storage Tanks

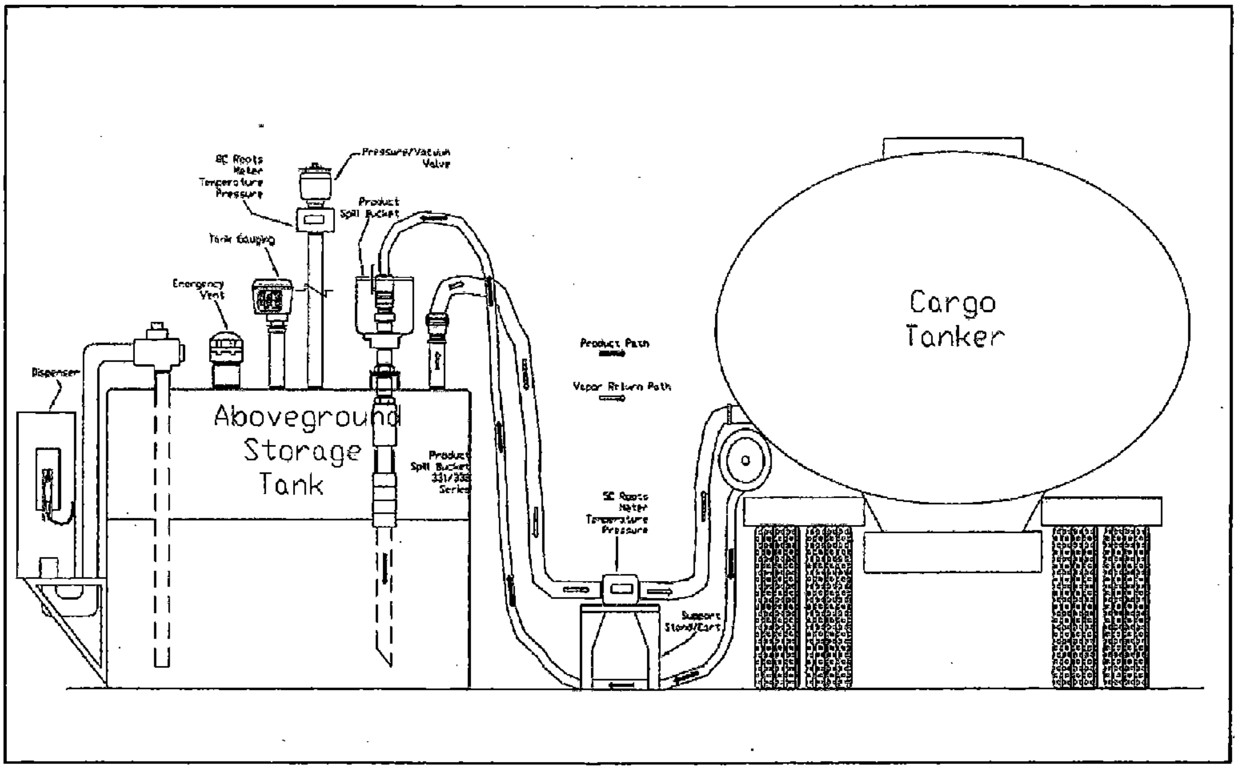
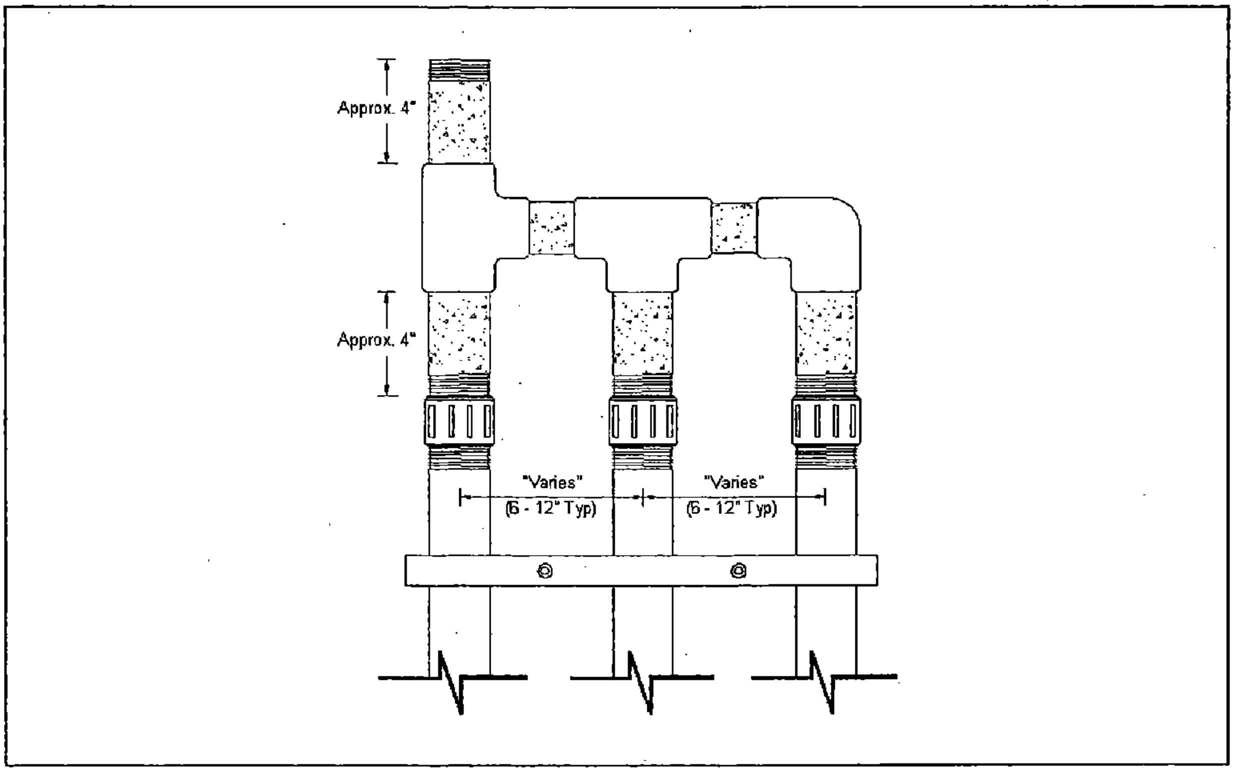


Figure 46 - Example of A Steel Vent Pipe Manifold



APPENDIX D

Proposed Amendments to TP-206.2: Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks

California Environmental Protection Agency

Air Resources Board

{PROPOSED}

Vapor Recovery Test Procedure

TP-206.2

Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks

Adopted: May 2, 2008
Amended: [Insert Amendment Date]

{Note: The text is shown in ~~strikeout~~ to indicate that it is proposed for deletion and underline to indicate that it is proposed for addition. {Bracketed text] is not part of the proposed amendment}.

California Environmental Protection Agency
Air Resources Board

Vapor Recovery Test Procedure

TP-206.2

Determination of Emission Factor for Standing Loss Control Vapor Recovery Systems Using Processors at Gasoline Dispensing Facilities with Aboveground Storage Tanks

Definitions common to all certification and test procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "ARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the ARB Executive Officer or his or her authorized representative or ~~designate.~~designee.

1. PURPOSE AND APPLICABILITY

The purpose of this procedure is to quantify the Standing Loss Control emission factor for a processor and pressure vacuum (P/V) vent valve used to control gasoline vapors from an aboveground storage tank (AST). This procedure is applicable to the determination of compliance with the Standing Loss Control (SLC) performance standards specified in Certification Procedure, CP-206, Certification and Testing Procedures for Gasoline Vapor Recovery Facilities Using Aboveground Storage Tanks.

Any modifications to the equipment and/or procedures used in execution of this test procedure are only permissible with prior written approval by the Executive Officer.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

During episodes of no ~~transfers (~~Phase I or Phase II activity~~)~~, the SLC emission factor is determined by ~~direct measurement of~~ calculating the mass of hydrocarbons emitted (in units of pounds of hydrocarbon emissions per 1,000 gallons ullage per day) at the following test points ~~locations~~:

1. Test Point 1_{outlet} is ~~(1) emitted through~~ the hydrocarbon concentration at the exhaust or outlet of a non-destructive or destructive processor.
2. Test Point 1_{inlet} is the hydrocarbon concentration at the inlet of a destructive processor
3. Test Point 2 is the hydrocarbon concentration ~~and (2) emitted~~ from the

~~pressure/vacuum (P/V)~~ valve~~(s)~~ on the AST vent pipe(s).

~~Using the results of the direct hydrocarbon measurements, the Standing Loss Control mass emission factor (in units of pounds of hydrocarbon emissions per 1,000 gallons ullage per day) may be calculated. The testing shall be conducted during the summer months (June 1 to September 30). The test period shall consist of a minimum 24-hour testing episode in which hydrocarbon emissions are continuously measured when daily maximum ambient temperature is between 90°F and 105°F.~~

3. BIASES AND INTERFERENCES

3.1 Failure to test a Standing Loss Control system that does not meet the Static Pressure Performance test requirements (TP-206.3) may bias the test toward either compliance or noncompliance, and shall invalidate the Standing Loss Control emission factor test results.

3.2 Phase I and Phase II transfers shall not be permitted during the 24-hour testing episode.

4. RANGE AND MEASUREMENT ERROR

4.1 This procedure can generate emission factors in the range of 0.00 to greater than 15.0 lbs/1000 gallons.

4.2 The maximum emission factor error is calculated to be 13%. ~~The maximum efficiency error is calculated to be 1.0%.~~

5. EQUIPMENT

Alternatives to the required equipment shall only be used subject to prior written approval by the ~~ARB~~ Executive Officer.

5.1 ~~Hydrocarbon (HC)~~Continuous Gas Analyzer~~(s)~~. ~~The H~~Continuous Gas analyzer~~(s)~~ shall have the following characteristics and capabilities:

5.1.1 Depending on the test point location of the hydrocarbon (HC) measurement, the HC analyzer shall be capable of continuously measuring HC concentrations ~~for~~ from 100 ppm to 80 percent by volume using propane as a calibration gas, or 75 ppm to 60 percent by volume using butane as a calibration gas.

5.1.2 Hydrocarbon ~~A~~analyzers at test point~~s~~ 1 and 2 shall use ~~a destructive detection principle, such as~~ a flame ionization detector (FID) or non-destructive infrared (NDIR) detection principle. Hydrocarbon analyzers at test point 1_{inlet} shall use a non-destructive detection principle, specifically, ~~or~~ non-dispersive infrared (NDIR). Hydrocarbon analyzers at test point 1_{outlet} may use either FID or NDIR depending on the expected range of the hydrocarbon concentration at this test point. A sufficient number of hydrocarbon analyzers shall be used to provide for simultaneous and continuous measurements at all applicable test points. The Executive Officer may allow ~~other~~ alternative measurement methods if the equivalency of the alternative method is established using the procedures in US EPA Method 301 – "*Field Validation of Pollutant Measurement Methods From Various Waste Media.*" ~~it is determined that equivalent results can be obtained.~~

5.1.3 Additional analyzers for ASTs with destructive vapor processors: If processor exhaust flow rate is to be determined by US EPA Method 2B, 40 CFR, Part 60, Appendix A, then the following additional analyzers are needed for Test Point 1_{outlet}.

5.1.3.1 Carbon Monoxide (CO) analyzer: As specified in ARB Method 100, title 17, CCR, section 94114, or US EPA Method 10, "Determination of Carbon Monoxide Emissions From Stationary Sources", 40 CFR Part 60, Appendix A. The CO analyzer shall be capable of continuously measuring CO concentrations from zero to 1000 ppm by volume.

5.1.3.2 Carbon Dioxide (CO_2) analyzer: As specified in ARB Method 100 or US EPA Method 3A, "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)", 40 CFR Part 60, Appendix A. The CO_2 analyzer shall be capable of continuously measuring CO_2 concentrations from zero to 10% by volume.

5.1.4~~3~~ ~~Hydrocarbon~~ Continuous analyzer calibration gas~~es~~ standards: Cylinders of certified, or National Institute of Standards and Technology (NIST) traceable, calibration gases ~~using propane (or butane)~~ containing the compound of interest in nitrogen, capable of providing calibration for the analyzer ranges recommended in Table 5-1.

5.1.5~~4~~ Gas Dilution System:~~.~~ A gas dilution system which meets the requirements of EPA Method 205, Verification of Gas Dilution Systems for Field Instrument Calibrations, CFR 40, Part 51, Appendix M (62 FR 32502, June 16, 1997) may be used to provide low-level calibration gases from a high-level calibration gas. The calibration gas used with a gas dilution system shall be an United States Environmental Protection Agency (US EPA) Protocol gas. A gas dilution system which meets the requirements of US EPA Method 205 may be used for all analyzer calibrations and sampling system bias checks. If a diluter is used, it must be included in the calibration of the analyzer(s).

Table 5-1
Recommended Continuous Analyzer Concentration Ranges

Test Point ~~(Fig.1)~~	Pollutant	Operating Principle	Ranges	Usable Concentration Range
Non-Destructive Processors				
1_{outlet}	HC	FID or NDIR	~~0 to10 ppm~~ ~~0 to 100 ppm~~ ~~0 to 1,000 ppm~~ 0 to 5,000 ppm ~~0 to 1.0%~~ 0 to 5.0% 0 to 10%	~~1.0 to 9.5ppm~~ ~~10 to 95 ppm~~ ~~100 to 950 ppm~~ 500 to 4,750 ppm ~~1,000 to 9,500 ppm~~ 5,000 ppm to 4.75% 10,000 ppm to 9.5%
2	HC	FID or NDIR	0 to 500 ppm ~~0 to 1,000 ppm~~ 0 to 5,000 ppm ~~0 to 1.0%~~ 0 to 5.0% ~~0 to 10.0%~~ ~~0 to 50.0%~~	50 to 475 ppm ~~100 to 950 ppm~~ 500 to 4,750 ppm ~~1,000 to 9,500 ppm~~ 5,000 ppm to 4.75% ~~1.0% to 9.5%~~ ~~5% to 48%~~
Destructive Processors				
1_{inlet}*	CO	NDIR	0 to 500 ppm	50 to 475 ppm
1_{inlet}*	CO_2	NDIR	0 to 5.0% 0 to 10.0%	5,000 ppm to 4.75% 1.0% to 9.5%
1_{inlet}*	HC	~~FID or~~ NDIR	0 to 10% 0 to 100% ~~0 to 1.0%~~ ~~0 to 5.0%~~	1.0 to 9.5% 10 to 95% ~~1,000 ppm to 9500 ppm~~ ~~5000 ppm to 4.75%~~
1_{outlet}	HC	FID	0 to 500 ppm 0 to 5,000 ppm	50 to 475 ppm 500 to 4,750 ppm
2	HC	FID or NDIR	0 to 500 ppm 0 to 5,000 ppm	50 to 475 ppm 500 to 4,750 ppm 5,000 ppm to 4.75%

* destructive processor only

Each range requires three calibration gases:

(1) High-Range Gas: Concentration between 80 and 100% of range.
(2) Mid-Range Gas: Concentration between 40 and 60% of range.
(3) Zero Gas: Nitrogen with a hydrocarbon concentration less than 0.25% of range.

5.1.~~6~~5 Sample lines shall be constructed of Teflon or other material that does not absorb or otherwise alter the sample gas.

~~5.1.6 Additional Analyzers for Systems with Destructive Vapor Processors: If processor exhaust flowrate is to be determined by US EPA Method 2B 40 CFR, Part 60, App.A-1 (36 FR 24877, December 23, 1971), then the following additional analyzers are needed for Test Point 1.~~

~~5.1.6.1 Carbon Monoxide (CO) analyzer: As specified in ARB Method 100, title 17, CCR, section 94114, or alternative test procedures approved by the Executive Officer.~~

~~5.1.6.2 Carbon Dioxide (CO_2) analyzer: As specified in ARB Method 100 or other alternative test procedures approved by the Executive Officer.~~

5.2 Data Acquisition System/Data Recorder: Provide a permanent record of ~~hydrocarbon~~ continuous analyzer concentration, temperature and pressure data using a strip chart recorder~~. A~~, a data logger or another electronic data acquisition system. ~~is also recommended.~~ Data shall be collected at intervals not to exceed one-second and averaged at intervals not to exceed one-minute. ~~Any electronic data acquisition system must be capable of integration at a ten second interval.~~ The strip chart, or ~~as well as~~ the data logger or data acquisition system~~, must~~ shall have a resolution of 0.5 percent of the analyzer range.

5.3 Volumetric Flow Rate Meters:~~.~~ Recommended volume meter ranges for each test point are shown in Table 5-2.

Table 5-2
Volume Meter Specifications

Test Point	Typical Range Measured (cfm)	Recommended Meter Range (cfh)
1_{inlet} 1_{outlet}	System specific	Determined during evaluation
2	Vent sleeve sweep: ~~2~~ 1 to 2~~0~~ ~~Vent : 0 to 5~~	0 to 800 ~~0 to 800~~

The volume meters are positive displacement or turbine meters that meet the following requirements:

5.3.1 Backpressure limits (BPL):

(a) Meters with a manufacturer specified maximum flow rating of greater than 1000 CFH shall demonstrate BPL < 1.10 inches WC at a flow rate of 3,000 CFH or the maximum flow rating specified by the manufacturer, whichever is less, and BPL < 0.05 inches WC at a flow rate of 30 CFH.

(b) Meters with a manufacturer specified maximum flow rating of less than 1000 CFH shall demonstrate BPL < 0.70 inches water column at a flow rate of 800 CFH and BPL < 0.04 inches WC at a flowrate of 16 CFH.

5.3.2 The error of the meter shall be less than 2% of the true volume over the entire range of flow rates for which it will be used.

5.3.3 Depending on the Test Point of the processor, install a manifold at either the meter inlet or meter outlet. The manifold shall be equipped with a taps to accommodate the following :

(a) Collection of sample for analyzer and sample return.

(b) Installation of pressure measurement device.

(c) Installation of thermocouple with a range of 0 to 200 deg F or suitable for the temperature being measured.

~~5.3.3 The meter shall be equipped with taps to accommodate the following as applicable for the specific Test Point:~~

~~(a) Test Point 1: differential pressure gauge with a full-scale range of less than or equal to four times the backpressure limit.~~

~~(b) Test Point 2: differential pressure gauge with a full-scale range of less than or equal to four times the backpressure limit.~~

5.3.4 Pressure Measurement Devices for Volume Meters.

Transducers, liquid manometers, Magnahelic gauges, electronic manometers, or equivalent with a design range suitable for the pressure being measured. The error of the pressure measuring device shall not exceed 3% of the true pressure over the range of pressures to be quantified.

5.3.5 Temperature Measurement Device for Volume Meters.

Thermocouple or thermometer with a design range of 0 to 200 ^{0}F or suitable for the temperature being measured. The error in the temperature measurement shall not exceed 4 degrees Fahrenheit.

5.4 Vapor Processor (Test Point 1).

5.4.1 Processor inlet and outlet sample ~~probe~~ pumps: Carbon vane, metal bellows or other pump design which do not provide a source or sink for hydrocarbon vapors, capable of at least 1 cfm during sampling. ~~Use equipment specified in TP-201.1A.~~

5.4.2 Processor outlet sample probe (destructive processors): The probe shall have an inside diameter of 6 mm or larger and shall be constructed of quartz, borosilicate glass, stainless steel, aluminum oxide or porcelain. An internal or external probe filter may be used. As necessary, provisions should be made for back flushing the filter to remove particulate build-up.

5.4.3 Processor outlet sample conditioner (destructive processors): The sample conditioner shall be capable of reducing the sample gas temperature to 15 °C (60 °F), or to 11 °C (20 °F) lower than the ambient temperature, whichever is lower. All parts of the conditioner exposed to the sample shall be glass, stainless steel or teflon. The sample gas shall not be bubbled or dispersed through the condensate such that minimum contact shall be maintained between any condensate and the sample gas. A temperature gauge shall be used to determine the temperature of the condenser outlet.

5.5 P/V Vent Sleeve Sampling Apparatus (Test Point 2).

5.5.1 A sleeve (Figure 1) that captures the entire mass of gasoline vapor emitted at the storage tank vent pipe(s). The Executive Officer may approve in writing other designs if demonstrated to produce a pressure drop of less than 0.01 inch WC inside the sleeve and within one inch WC of the outer surface of the tank vent or tank vent P/V valve at a sleeve rate of 1 - 2 cfm. Sleeves must be tested before use in the field to validate the collection efficiency of the sleeve and accuracy of the hydrocarbon mass calculation. Testing shall occur as described in Section 5.5.1.1 below. **CAUTION: Ensure that the exhaust from the vent sleeve pump and vent sleeve analyzers are directed to a safe location and that hazards associated with exposure to gasoline and gasoline vapors are addressed.**

5.5.1.1 Meter propane calibration gas with a concentration of 40 to 60% by volume through a mass flow controller (a bubble meter or precision rotameter with sufficient accuracy is acceptable) at approximately 200 ml/min and into the inlet of the simulated vent pipe discharging to the vent sleeve sample apparatus equipped with vent sleeve HC analyzers. Determine the time that calibration gas was allowed to enter the sleeve and calculate the mass of propane entering the sleeve from the flow rate determined from the mass flow controller and the known calibration gas concentration. The mass of HC entering the vent sleeve must be ±5% of the mass of HC collected from the vent sleeve sampling apparatus volume, temperature, pressure and HC concentration measurements and the data recording system and mass calculation algorithms.

5.5.2 Sleeve Tubing: Teflon. Care should be taken that a representative sample of the sleeve flow is routed to the analyzer. The unanalyzed portion of sample flow shall be safely discharged to the atmosphere.

5.5.3 Sleeve Sample Pump: Carbon vane, metal bellows or other pump designs which do not provide a source of or sink for hydrocarbon vapors, capable of 1 to 2 cfm.

5.6~~5~~ Ambient Temperature Measurement: Use a temperature measurement device capable of measuring ambient temperature with a resolution of 2 deg F.

5.7~~6~~ Ambient Pressure Measurement: Use a pressure measurement device capable of measuring atmospheric pressure to within 2.5 mm Hg.

5.8~~7~~ Gasoline Containers for RVP Samples: As specified in Section 2296 of title 13, CCR.

6. CALIBRATIONS

All measurement devices shall be calibrated as described below. A record of all calibrations shall be maintained.

6.1 Continuous Gas Analyzers: Calibration curves shall be produced no longer than six months before testing using ARB's SOP 054, "Standard Operating Procedure for the Multilevel Calibrations of Pollutant Gas Analyzers" (September 1997). Field calibrations during testing shall be conducted as described in Section ~~8.1.1~~ and Section 10.

6.2 Calibration Gases:

6.2.1 Certification. The calibration gases shall be certified according to one of the following options:

6.2.1.1 The EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (EPA-600/R-97/121, September 1997), or

6.2.1.2 To an analytical accuracy of ± 2% percent, traceable to a reference material approved by the National Institute of Standards and Technology (NIST) and recertified annually.

6.2.2 Documentation:~~.~~ Information on calibration gas cylinders shall be entered into a log identifying each cylinder by serial number. Sufficient information shall be maintained to allow a determination of the certification status of each calibration gas and shall include: (1) the data put in service, (2) assay result, (3) the dates the assay was performed, (4) the organization and specific personnel who performed the assay, and (5) the date taken out of service.

6.3 Volume Meters: All volume meters shall be calibrated on an annual basis against a bell type spirometer at flow rates representing 1, 10, 30, 60, and 90% of the meter capacity. The bell type spirometer shall be calibrated against a NIST traceable standard or a transfer standard traceable to NIST. The accuracy of the meter shall be 2% of the true volume measured over the range of flow rates encountered in application of this test procedure. Alternatively, the field volume meter may be calibrated against a transfer standard traceable to NIST. The transfer standard shall be calibrated against the bell type spirometer or wet test meter and may not be used in the field as a working meter.

6.4 Pressure Measurement Devices: All pressure measurement devices shall be tested for accuracy using a reference gauge, incline manometer, NIST traceable standard, or static pressure calibrator, for five points (e.g. 10, 25, 50, 75, and 90% of full scale) to verify that the accuracy is within 5 percent. This test for accuracy shall be conducted prior and immediately following the test period. Alternatively, pressure measurement devices may be calibrated in accordance with manufacturer's specifications. The ~~certification~~ test report shall provide documentation on the calibration of pressure measurement devices.

6.5 Temperature Measurement Devices: Temperature measurement devices shall be checked ~~semi-~~annually using an ice bath, ambient air, and boiling water. This accuracy check shall be conducted by comparison to a NIST traceable measurement device.

7. PRE-TEST REQUIREMENTS

7.1 Pre-test Static Pressure Performance Test:~~.~~ TP-206.3 shall be conducted preceding test equipment installation. First, check UST pressure. If at a vacuum, add N_2 gas to bring AST pressure up to zero gauge pressure then proceed with TP-206.3. Document test results.

~~7.2 Test Point 2 – Vent Pipe: See Figure 1. Assemble the vent sleeve and sampling equipment. All test sites are required to manifold their vent pipes to one P/V valve. Determine the positive and negative cracking pressures, positive leak rate, and negative leak rate in accordance with TP-201.1E CERT to verify that the P/V valve complies with specifications listed in CP-206, or with specifications requested by the applicant and approved by the Executive Officer.~~

7.2~~3~~ Test Point 1_{inlet} and 1_{outlet} - Vapor Processor: Install sampling equipment upstream and downstream ~~(outlet)~~ of the vapor processor.

7.2.1 Upstream or Inlet to Destructive Vapor Processor: The vapor processor inlet sample and temperature and pressure measurements shall be collected in accordance with US EPA Method 2B, "Determination of Exhaust Gas Volume Flow Rate from Gasoline Vapor Incinerators", 40 CFR Part 60, Appendix. A-1 (36 FR 24877, December 23, 1971). The sample shall be taken from a manifold attached to the inlet or outlet side of the volume meter which has been inserted in the processor inlet line. The installation of test equipment shall not interfere with the normal operation of the vapor processor. The total volume of sample taken from the processor inlet for the purpose of hydrocarbon concentration measurement must be returned, unaltered to the sample manifold.

7.2~~3~~.2~~1~~ Downstream or Outlet of Destructive Vapor Processor: Sampling points at the processor ideally should be at least eight stack diameters downstream and two stack diameters upstream of any flow disturbance. If these criteria cannot be met without altering the stack, a sampling point which is at least two stack diameters downstream and one-half diameter upstream of any flow disturbance may be used. Sampling locations that do not meet these minimum criteria shall be approved in writing ~~advance of testing~~ by the ~~ARB~~ Executive Officer prior to testing. ~~Hydrocarbon concentrations are measured at this test point for all vapor processors.~~ HC, CO and CO_2 concentrations are ~~also~~ measured ~~for~~ at the outlet of destructive processors ~~by~~ using US EPA Method 2B, "Determination of Exhaust Gas Volume Flow Rate from Gasoline Vapor Incinerators,"~~,~~ 40 CFR Part 60, Appendix~~.~~ A-1 (36 FR 24877, December 23, 1971).

7.2.3 Outlet of Non-Destructive Vapor Processor: The vapor processor outlet sample HC concentration, temperature and pressure measurements shall be collected in a sample manifold attached to the outlet side of the volume meter which has been inserted in the processor outlet line. The installation of test equipment shall not interfere with the normal operation of the vapor processor. If the HC analyzer sampling rate at this Test Point exceeds one-half the processor exhaust flow rate, the total volume of sample taken from the processor outlet must be returned, unaltered to the sample manifold.

7.3 Test Point 2 – P/V Vent Sleeve: Assemble the P/V vent sleeve and sampling equipment as shown in Figure 1. All test sites are required to manifold their vent pipes to one P/V valve. The P/V vent HC concentration, temperature and pressure measurements shall be collected with a sample manifold attached to the outlet side of the volume meter, which is located downstream of the pump used to seep the P/V vent sleeve. Determine the positive and negative cracking pressures, positive leak rate, and negative leak rate in accordance with TP-201.1E CERT, prior to performing TP-206.3, to verify that the P/V valve complies with specifications listed in CP-206, or with specifications requested by the applicant and approved by the Executive Officer.

7.4 The certification engineering evaluation may identify ~~have identified~~ additional parameters beyond those listed in TP-206.2 to be monitored during the test. Verify that all equipment needed to monitor any additional parameters is calibrated and installed. Prepare additional data forms if necessary.

7.5 Post-Installation Facility Leak Test: After all test equipment is installed, conduct a pressure decay test in accordance with TP-206.3. Corrective action shall be taken as necessary until facility meets TP-206.3 requirements.

7.6 System Equilibration:~~.~~ After completing the pre-installation and post-installation facility leak tests ~~7.4~~, wait at least 16 hours before data collection. Take steps to ensure facility and system operations are minimally disturbed by the test equipment in the period between equipment installation and the start of the test.

8. DAILY PRE-TEST PROCEDURES

8.1 Field Calibration.

8.1.1 Hydrocarbon Analyzers: Follow manufacturer's instructions concerning warm-up time and adjustments. On each test day, prior to data collection, zero the analyzer with a zero gas and span with known concentrations of calibration gases at levels which are 40 to 60% and 80 to 100% of the concentration ranges to be used for the test.

Conduct the analyzer calibration error check by sequentially introducing the three calibration gases (~~high-range, mid-range and~~ zero gas, high-range and mid-range) and recording the analyzer response to each calibration gas. Make no adjustments to the sampling/analysis system except those necessary to achieve the proper calibration gas flow rate. The analyzer calibration error for any calibration gas shall not exceed ±2 percent of the range. If needed, take corrective action until acceptable performance is achieved.

Perform a leak check on the vacuum side of the assembly at the maximum pump vacuum. Correct any leaks found and repeat the leak check and correction procedure until no leak is detected.

8.1.2 CO and CO_2 Analyzers: Repeat instructions in 8.1.1 for CO and CO_2 analyzers if applicable.

8.1.3 Pressure Measurement Device: Prior to and immediately following each day of testing, record the pressure measuring device(s) response to the pressure generated by a static pressure calibrator at 0, 40, and

80% of the specified range of operation. If pressure differs more than 5%, recalibrate the device. Document instrument response before and after adjustment.

8.1.4 Temperature Measurement Device:~~.~~ Check the accuracy of the temperature measurement device(s) against an NIST traceable mercury-glass thermometer at ambient temperature prior to and immediately following each day of testing. If necessary, adjust the temperature read-out in accordance with manufacturer's instructions. Provide a copy of these instructions and document the instrument response before and after adjustment in the test report.

8.2 Sampling System Bias Checks: Check sampling set-up by introducing a known hydrocarbon concentration as close to the sample point as possible. If the difference between the analyzer field calibration and the sample system bias check exceeds ±5% of the range for the high-level calibration gas, the system fails the bias check and corrective action must be taken. Calculate bias using Equation 8.1. All sampling points must pass the bias check before the test can proceed.

Equation 8.1

$$\text{Bias} = \left[\frac{(C_a - C_b)}{R} \right] x100$$

where:

C_a = analyzer response for calibration gas for field calibration

C_b = analyzer response for calibration gas for sampling system bias check

R = analyzer range

8.3~~2~~ Initiate Test Documentation:

8.3~~2~~.1 Photographs shall be taken at each test point to document the equipment set-up. Any changes in configuration during the test shall also be documented by photographs, along with the date and time of the modification.

8.3~~2~~.2 Testers shall maintain a test log which shall document activities at the test site, such as modifications to equipment and the reasons for testing decisions. The tester shall update the test log at least twice a day.

8.4~~3~~ RVP Sample: If required by the ~~ARB~~ Executive Officer, collect gasoline samples of each grade as described in title 13, CCR, Section 2296.

8.5~~4~~ Determine the ullage in gallons of gasoline in the test tank through the gauging port, measurement stick, or other means approved by the Executive Officer.

9. TEST PROCEDURE

~~Collect data during periods of no transfers (~~Phase I and/or Phase II transfers are not permitted during the test period. Should any occur, the test results shall be voided~~)~~. Hydrocarbon concentration ~~emissions~~ and volume measurements at Test Point~~s~~ 1 (processor) and Test Point 2 (P/V vent)~~, if applicable,~~ are to be monitored continuously for a minimum 24 hours during the testing episode.

9.1 Testing requirements:

9.1.1 Testing shall be conducted in accordance with the time period and temperature range specified by Sections 3.3.2 and 3.4.2 of CP-206. ~~during the summer months (June 1 to September 30). The Executive Officer may allow testing outside the summer months if the criteria of section 9.1.2 are met.~~

~~9.1.2 Minimum one testing episode during the test period when the ambient temperature is between 90°F and 100°F.~~

~~9.1.3~~ 9.1.2 The testing episode shall be a minimum 24 hours in duration. Record the start date and time.

~~9.1.4~~ 9.1.3 No Phase I or Phase II transfers are permitted during the testing episode.

9.2 Data Recording: In addition to the data collection described above, the tester shall record the following parameters at the minimum frequency set forth below:~~.~~

9.2.1 Ambient Temperature: Hourly

9.2.2 Ambient Barometric Pressure: Hourly

10. END OF TEST DAY PROCEDURES

These procedures are required at the end of each test day.

10.1 System Bias Checks: Conduct for all analyzers used that test day. Perform the sampling system bias check by alternately introducing zero gas and the calibration gas as close to the sample point as possible. Operate the system at the normal sampling rate and make no adjustments to the measurement system other than those necessary to achieve proper calibration gas flow rates through the sampling system to the gas analyzer.

The test run shall be considered invalid if the difference of the zero or calibration gas measured for the initial analyzer calibration in section 8.1 and the zero or calibration gas measured for the final bias check in section 10.1 exceeds ±5% of the range, as determined by equation 10.1.

Equation 10.1

$$\text{Bias} = \frac{(C_a - C_{fb})}{R} \times 100$$

Where:

C_{fb} = analyzer response for the zero or upscale calibration gas for post run sampling system bias check

C_a = analyzer response for the zero or upscale calibration for initial analyzer calibration

R = analyzer range

10.2 Zero and Calibration Drift: The test run shall be considered invalid if the difference of zero or calibration gas measured for the initial bias check in section 8.2 and the zero or calibration gas measured for the final bias check in section 10.1 exceeds ±3% of the range as determined by equation 10.2 below.

Equation 10.2

$$\text{Drift} = \frac{(C_{ib} - C_{fb})}{R} \times 100$$

Where:

C_{fb} = analyzer response for the zero or upscale calibration gas for post run sampling system bias check

C_{ib} = analyzer response for the zero or upscale calibration for initial system bias check

R = analyzer range

10.~~2~~3 Pressure Measurement Devices: Following each day of testing, record the pressure measuring device(s) response to the pressure generated by a static pressure calibrator at 0, 40, and 80% of the specified range of operation. If necessary, adjust the instrument response in accordance with the manufacturer's instructions. Provide a copy of these instructions and document the instrument response before and after adjustment in the Certification Test Report.

10.~~3~~4 RVP Samples. If required by the Executive Officer, take samples of each gasoline grade in accordance with Section 2296 of title 13, CCR.

10.~~4~~5 Log. Summarize the day's testing activities and document any problems encountered during testing in the testing log.

10.~~5~~6 Record end date and time.

11. POST-TEST PROCEDURES

The test is completed when valid measurements have been recorded for each 24-hour test episode. After completing the daily post-test activities in Section 10, continue as follows:

11.1 Dismantle equipment. Remove testing apparatus and carefully reconnect system plumbing to original configuration.

11.2 Static Pressure Performance Test. Conduct a static pressure performance test using TP-206.3. Failure of static pressure performance test will invalidate section 9 test results.

12. CALCULATING RESULTS

Data from each test point is used to determine an emission factor in lbs/1000 gallons ullage/day.

12.1 Test Point 1_{outlet}: Processor Outlet (Non-Destructive Processors)

An emission factor in lbs hydrocarbon/1000 gallons ullage/day is calculated for the processor outlet Test Point for each 24 hour testing episode.

12.1.1 The sample volume~~s~~ for Test Point 1_{outlet} shall be corrected to standard conditions ~~for each testing episode~~ as shown in Equation 12.1.1.

Equation 12.1.1

$$Q_i = \frac{V_m}{t} \times \left(\frac{528}{T}\right) \times \left[\frac{P_{bar} + \left(\frac{P}{13.6}\right)}{29.92}\right]$$

where:

Q_i	=	volumetric flow rate at Test Point *i* corrected to standard conditions (ft^3/day @ 68 °F and 1 atm.).
V_m	=	meter ~~measured~~ volume (ft^3).
P_{bar}	=	barometric pressure (in. Hg).
P	=	meter pressure (inches water column).
T	=	meter temperature (°R).
t	=	time period of testing in days (e.g. 32 hours / 24 hours/day = 1.33 days)
528	=	standard temperature (°R)
13.6	=	conversion factor from inches water column to in. Hg
29.92	=	standard pressure (in. Hg)

12.1.2 The mass emission factor for ~~each~~ Test Point 1_{outlet} (M_1) ~~testing episode~~ shall be calculated as ~~follows~~ shown in Equation 12.1.2:

Equation 12.1.2

$$M_i = \frac{(Q_i)(C_i)(MW)(1{,}000)}{(385)(G_i)}$$

where:

M_i	=	emission factor for ~~testing episode~~ Test Point *i* (lb HC/1,000 gallons ullage/day)
Q_i	=	volumetric flow rate for ~~testing episode~~ Test Point *i* corrected to standard conditions (ft^3/day) from Equation 12.1.1.

C_i = hydrocarbon concentration for ~~testing episode~~ Test Point i (volume fraction, i.e. $ppm_v / 10^6$ or Volume % / 10^2)

MW = molecular weight of HC analyzer calibration gas (lb/lb-mole). For example, if propane is used as a calibration gas, the molecular weight is 44 lb/lb-mole.

385 = standard volume (ft^3) of one lb-mole of ideal gas at standard temperature and pressure (528°R and 29.92 in. Hg)

G_i = ullage of test tank for testing episode i (gallons).

1,000 = Conversion factor to 1,000 gallons

12.2 Test Point 1_{inlet} and Test Point 1_{outlet}: Processor Inlet and Processor Outlet (Destructive Processors)

An emission factor in lbs hydrocarbon/1000 gallons ullage/day is calculated for the processor outlet Test Point for each 24 hour testing episode.

12.2.1 Calculate the standard volumetric flow rate for Test Point 1_{inlet} (Q_{in}) for ~~over~~ the testing episode using Equation 12.1.1.

12.2.2 Calculate the standard volumetric flow rate for Test Point 1_{outlet} (Q_{out}) for ~~over~~ the testing episode as shown in Equation 12.2.1

Equation 12.2.1

$$Q_{out} = Q_{in}\left(\frac{N[HC]_{in}}{N[HC]_{out} + [CO_2] + [CO] - 300}\right)$$

where:

Q_{out} = vapor incinerator outlet volumetric flow rate at standard conditions (ft^3/day @ 68 °F and 1 atm.)

Q_{in} = vapor incinerator inlet volumetric flow rate corrected to standard conditions (ft^3/day @ 68 °F and 1 atm.)

N	=	number of carbon atoms in each molecule of calibration gas
$[HC]_{out}$	=	vapor incinerator outlet hydrocarbon concentration (ppm)
$[CO_2]$	=	vapor incinerator outlet carbon dioxide concentration (ppm)
[CO]	=	vapor incinerator outlet carbon monoxide concentration (ppm)
300	=	assumed background concentration (ppm) of CO_2

12.2.3 Calculate the processor exhaust emission factor (M_1) in lbs/1000 gallons ullage/day over the testing episode using Equations 12.1.2 and 12.2.1.

12.3~~2~~ Test Point 2: P/V Vent Sleeve

An emission factor in lbs hydrocarbon/1000 gallons ullage/day is calculated for the P/V vent sleeve, Test Point 2, for each 24 hour testing episode.

~~The vent emissions shall be calculated over the testing episode. Knowledge of the total station gasoline throughput for the specified time period is necessary to calculate the emission factor.~~

12.3.1 Calculate the standard volumetric flow rate at Test Point 2 for ~~over~~ the testing episode using Equation 12.1.1.

12.3~~1~~.2 Calculate the ~~M_2~~ P/V vent sleeve emission factor for Test Point 2 (M_2) in lbs/1000 gallons ullage/day for ~~over~~ the testing episode using Equation 12.1.2.

~~12.3 Test Point 1 Processor~~

~~12.3.1 If a volume meter is used at Test Point 1, calculate the standard volumetric flowrate of the testing episode using Equation 12.1.1.~~

12.4 Standing Loss Control System Emission Factor: Calculate the Phase II system emission factor using Equation 12.4.

Equation 12.4

$$EF_{HC} = M_1 + M_2$$

Where:

EF_{HC} = Standing Loss Emission Factor in lbs/1000 gallons ullage/day

M_1 = Mass emission factor at Test Point 1 (processor), lbs/1000 gallons ullage/day

M_2 = Mass emission factor at Test Point 2 (P/V vent valve), lbs/1000 gallons ullage/day

13. REPORTING RESULTS

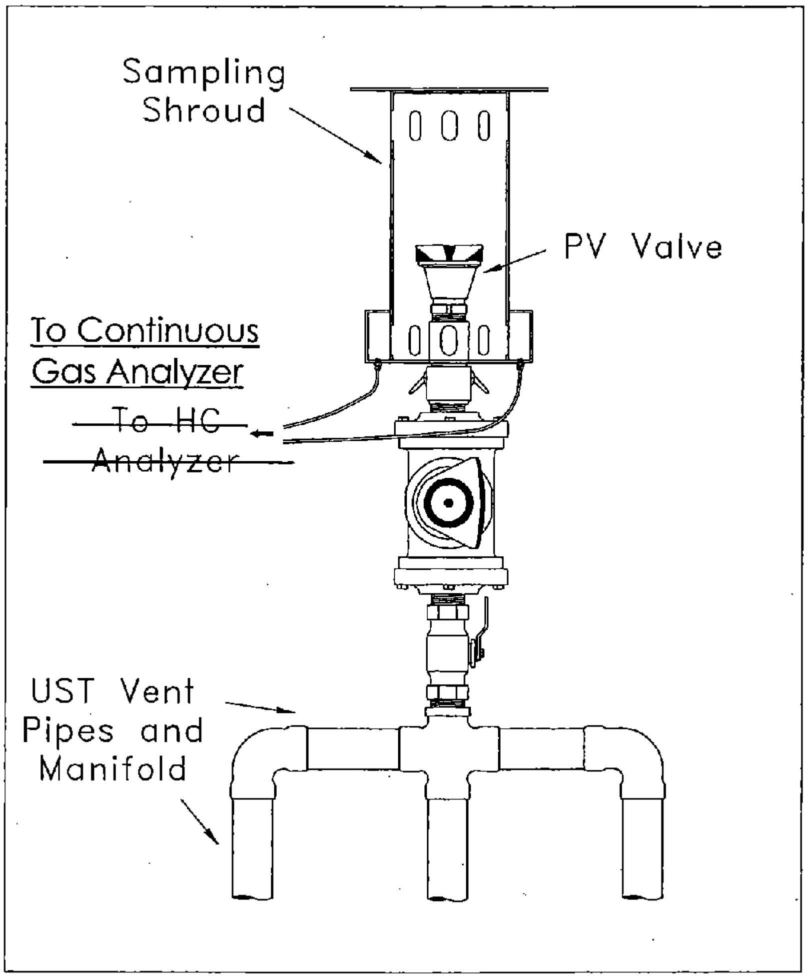
Data are collected by ARB. All data forms, equipment calibrations, completed forms, results, and other test documentation shall be included in a test report.

In cases of conflict between hard copy and electronic format, the hard copy shall be presumed correct, unless the ARB Executive Officer specifies otherwise in writing.

14. ALTERNATIVE PROCEDURES

14.1 This procedure shall be conducted as specified. Any modifications to this test procedure shall not be used for certification unless prior written approval has been obtained from the ~~ARB~~ Executive Officer, pursuant to Section 15 of Certification Procedure CP-206.

Figure 1
Vent Pipe Sleeve



APPENDIX E

Repealed Text of CP-204: Certification Procedure for Vapor Recovery Systems of Cargo Tanks

Proposed Amendments to CP-204: Certification Procedure for Vapor Recovery Systems of Cargo Tanks

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

California Environmental Protection Agency

Air Resources Board

~~**Vapor Recovery Certification Procedure**~~

~~**CP-204**~~

~~Certification Procedure for~~
~~Vapor Recovery Systems of~~
~~Cargo Tanks~~

~~Adopted: April 12, 1996~~
~~Amended: March 17, 1999~~

The certification procedure is being amended. For ease of viewing, the procedure is shown as repealed text and proposed text.

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~CP-204~~

~~TABLE OF CONTENTS~~

~~1 GENERAL INFORMATION AND APPLICABILITY~~ .... ~~1~~

~~1.1 Legislative and Regulatory Requirements of Other California State Agencies~~ .... ~~2~~

~~1.2 Legislative and Regulatory Requirements of Other Agencies~~ .... ~~2~~

~~2 SUMMARY OF CERTIFICATION PROCESS~~ .... ~~3~~

~~2.1 Summary of Requirements of Certification Procedure~~ .... ~~3~~

~~2.2 Summary of Time Periods for Review and Processing~~ .... ~~4~~

~~3 APPLICATION FOR CERTIFICATION~~ .... ~~5~~

~~3.1 Application for Approval of a Vapor Recovery System Design~~ .... ~~5~~

~~3.2 Application for Certification of an Individual Cargo Tank~~ .... ~~6~~

~~3.3 Information Required by the ARB Executive Officer~~ .... ~~6~~

~~3.3.1 Evidence of Corporate and Financial Responsibility~~ .... ~~6~~

~~3.3.2 Design~~ .... ~~7~~

~~3.3.2.1 Engineering Drawings~~ .... ~~7~~

~~3.3.2.2 List of Components by Manufacturer and Model Number~~ .... ~~7~~

~~3.3.3 Installation, Operation, and Maintenance~~ .... ~~7~~

~~3.3.4 Compatibility~~ .... ~~7~~

~~4 Performance Standards, Performance Specifications, and Test Procedures~~ .... ~~8~~

~~4.1 Performance Standards and Test Procedures~~ .... ~~8~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~4.1.1 Static Pressure .... 8~~

~~4.1.2 Static Pressure .... 9~~

~~(1) Five Minute Performance Standard (Daily) .... 10~~

~~(2) One Minute Performance (Daily) .... 10~~

~~4.1.3 Internal Vapor Valve .... 11~~

~~(1) Five Minute Performance Standard (Daily) .... 11~~

~~(2) One Minute Performance (Daily) .... 11~~

~~4.1.4 Vapor and Liquid Leaks .... 12~~

~~(1) Vapor Leak .... 12~~

~~(2) Liquid Leak .... 13~~

~~4.2 Performance Specifications and Test Procedures .... 13~~

~~4.3 Performance Standards and Performance Specifications for Novel Systems .... 14~~

~~4.4 Test Procedures for Novel Systems .... 14~~

~~4.4.1 Technical Identification of Need .... 14~~

~~4.4.2 Administrative Requirement for Development .... 14~~

~~4.4.3 Evaluation and Approval .... 14~~

~~**5 EVALUATION AND TESTING OF VAPOR RECOVERY EQUIPMENT**~~ ~~........ 15~~

~~5.1 General Evaluation and Testing .... 15~~

~~5.2 Alternative Evaluation and Testing .... 16~~

~~5.3 Preliminary Evaluation .... 16~~

~~5.4 Field Testing .... 17~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~5.5 Bench Testing .... 17~~

~~5.6 Evaluation .... 17~~

~~**6 DOCUMENTATION FOR CERTIFICATION** .... 17~~

~~**7 CERTIFICATION** .... 18~~

~~7.1 Variance from Certification Requirements .... 18~~

~~7.2 Requirements for Keeping Documents with Cargo Tank .... 19~~

~~7.3 Requirements for Determinations of Compliance and Violation .... 19~~

~~7.3.1 General Requirements .... 20~~

~~7.3.2 Specific Requirements .... 20~~

~~7.3.2.1 Yearly Requirements .... 22~~

~~7.3.2.2 Permanent Requirements .... 22~~

~~7.3.2.3 Requirements in Preparation for Pressure Testing .... 23~~

~~(1) Five Minute Pressure Testing (TP-204.1) .... 24~~

~~(2) One Minute Pressure Testing (TP-204.2) .... 24~~

~~7.3.2.4 Requirements at Conclusion of Pressure Testing .... 25~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~California Environmental Protection Agency~~
~~Air Resources Board~~

~~Vapor Recovery Certification Procedure~~

~~CP-204~~

~~Certification Procedure for Vapor Recovery Systems of Cargo Tanks~~

~~1 GENERAL INFORMATION AND APPLICABILITY~~

~~This document describes a procedure for certifying equipment which recovers vapors emitted in association with gasoline marketing operations involving cargo tanks.~~

~~Other vapor recovery certification procedures provide instructions for determining performance standards, performance specifications, and test procedures for equipment which recovers vapors emitted in association with gasoline marketing operations involving: dispensing facilities (CP-201); bulk plants and cargo tanks (CP-202); and supply lines, terminals, delivery lines, and cargo tanks (CP-203). For novel facilities or systems to which CP-201 through 204 do not apply, CP-205 provides instructions for determining performance standards, performance specifications, and test procedures for equipment which recovers vapors emitted in association with gasoline marketing operations.~~

~~This procedure is applicable to tank trucks and trailers that are equipped for the transport of gasoline and that must be equipped for gasoline vapor recovery in accordance with air pollution control district rules.~~

~~Only a vapor recovery system of a design that is certified by the ARB Executive Officer may be installed on a cargo tank.~~

~~No person shall operate, or allow the operation of, a cargo tank unless the cargo tank is certified and maintained in accordance with these procedures. Certifications shall be issued on an annual basis and shall expire on the last day of the month one year following the month of issuance of the certification.~~

~~The owner or operator of any cargo tank shall:~~

~~(1) annually test such tank(s) in accordance with the provisions of § 4 and~~

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~~(2) annually apply for certification of such tank(s) in accordance with this procedure.~~

~~Tests shall be conducted by the owner of the cargo tank, or a consultant, at the expense of the owner. Prior to testing, the owner shall notify the Executive Officer, or his or her designate(s), of the date, time, and location of the testing. The Executive Officer or designate(s) may observe or conduct tests.~~

~~A set of definitions common to all certification and test procedures is in:~~

~~**D-200 Definitions for Certification Procedures and Test Procedures for Vapor Recovery Systems**~~

~~1.1 Legislative and Regulatory Requirements of Other California State Agencies~~

~~As required, the ARB Executive Officer shall coordinate this certification procedure with:~~

~~(1) Department of Food and Agriculture, Division of Measurement Standards (DMS)~~

~~(2) State Fire Marshal (SFM)~~

~~(3) Department of Industrial Relations, Division of Occupational Safety and Health (DOSH)~~

~~1.2 Legislative and Regulatory Requirements of Other Agencies~~

~~In addition to California's local Districts, other federal, state, or local agencies may have legal jurisdiction regarding vapor recovery systems. The applicant is solely responsible for:~~

~~(1) compatibility of the applicant's equipment with the application of any other agency's test procedures;~~

~~(2) testing of the applicant's equipment with such test procedures; and~~

~~(3) compliance with performance standards and performance specifications in any other agency's regulations referencing such test procedures.~~

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~~The ARB Executive Officer is not responsible for items (1) through (3) above.~~

~~2 SUMMARY OF CERTIFICATION PROCESS~~

~~2.1 Summary of Requirements of Certification Procedure~~

~~This certification procedure has five interacting components which may be applied iteratively in complex cases. For example, review of evaluation and testing may yield additional specifications. The five components are:~~

~~2.1.1 Application for Certification (See § 3)~~

~~The applicant must submit all required application information. The ARB Executive Officer shall consult with the applicant, shall review the information, may require revisions or more information, and shall approve the application after it is determined to be complete.~~

~~2.1.2 Standards, Specifications, and Test Procedures (See § 4)~~

~~The ARB Executive Officer shall specify performance standards, performance specifications, and test procedures for vapor recovery equipment in response to a completed application for certification.~~

~~2.1.3 Evaluation and Testing of Vapor Recovery Equipment (See § 5)~~

~~The vapor recovery equipment shall be subjected to evaluation and testing according to the performance standards, performance specifications, and test procedures at the applicant's expense. The ARB Executive Officer shall conduct all evaluation and testing unless the ARB Executive Officer determines that the equipment owner or operator shall contract for or conduct specified evaluation and testing on a case-by-case basis.~~

~~2.1.4 Documentation for Certification (See § 6)~~

~~A Certification Report shall be prepared, at the applicant's expense, documenting the preceding components:~~

~~(1) Application for Certification;~~

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~~(2) Standards, Specifications, and Procedures; and~~
~~(3) Evaluation and Testing of Vapor Recovery Equipment.~~

~~The ARB Executive Officer shall consult with the applicant, shall review the report, may require additional work on the components, and shall approve and sign the Certification Report after it is determined that:~~

~~(1) The Certification Report is complete; and~~
~~(2) the Certification Report documents successful performance of the subject vapor recovery equipment according to the required performance standards, performance specifications, and test procedures.~~

~~2.1.5 Certification (See § 7)~~

~~Evidence of certification shall be an ARB Executive Order (which shall reference the Certification Report) signed by the ARB Executive Officer.~~

~~2.2 Summary of Time Periods for Review and Processing~~

~~The following definitions of ARB Executive Officer Actions and Time Periods shall apply to all applications subject to this procedure per CCR, Title 17, § 60030 (in some cases, another enforcing agency shall perform actions):~~

~~"ARB Executive Officer Interim Action #1"~~

~~means that the ARB Executive Officer determines that application is deficient per § 3, § 4, § 5, or § 6 and communicates specific deficiencies to the Applicant in writing.~~

~~"ARB Executive Officer Interim Action #2"~~

~~means that the ARB Executive Officer determines that application is complete per § 3, § 4, § 5, and § 6 and accepted for filing and communicates such determination to Applicant in writing.~~

~~"ARB Executive Officer Final Action"~~

~~means that the ARB Executive Officer acts to disapprove or approve the application per § 3, § 4, § 5, § 6, and § 7 and communicates such determination to the Applicant in writing.~~

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~~**"Time Periods"**~~

~~are defined in the table below:~~

~~**FROM: ACTION BELOW**~~	~~**TIME PERIOD**~~	~~**TO: ACTION BELOW**~~
~~Applicant files an initial application for certification.~~	~~within 30 days~~	~~ARB Executive Officer Interim Action #1 or #2~~
~~Applicant files an amended application for certification.~~	~~within 15 days~~	~~ARB Executive Officer Interim Action #1 or #2~~
~~ARB Executive Officer Interim Action #2~~	~~within 90 days~~	~~ARB Executive Officer Final Action~~

~~The time periods specified above may be extended by the ARB Executive Officer for good cause per CCR, Title 17, § 60030 (d).~~

~~3 APPLICATION FOR CERTIFICATION~~

> ~~**Warning:** All of the information specified in all of the following subsections must be submitted to the ARB Executive Officer for an application to be considered complete.~~

~~Applications which do not completely satisfy the requirements of this section shall be returned to the applicant with an indication of deficiencies.~~

~~3.1 Application for Approval of a Vapor Recovery System Design~~

~~The applicant shall submit a set of engineering drawings and specifications including but not limited to piping configuration and dimensions, types of seals, and types of couplers for delivery hoses. Data which demonstrate that the cargo tank vapor recovery piping system will work in conjunction with the appropriate underground storage tank vapor recovery system for controlling the gasoline vapors displaced during the filling of underground storage tanks shall also be~~

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~~submitted.~~

~~The ARB Executive Officer, upon review of the drawings and specifications of a system design, and upon finding that the system complies with the requirements of § 4.2.1.1, shall issue a System Design Approval Number.~~

~~3.2 Application for Certification of an Individual Cargo Tank~~

~~The application for certification of individual cargo tanks shall be submitted to the ARB Executive Officer, and shall contain the following information:~~

~~(1) Name, address, and telephone number of owner or operator, and company name (if applicable).~~

~~(2) The sizes and number of compartments of the cargo tank.~~

~~(3) The cargo tank's California Highway Patrol cargo tank identification number.~~

~~(4) The air pollution control district in which the cargo tank's base of operation is located.~~

~~(5) A statement that the tank has been tested according to the test procedures in TP-204.1 and complies with the performance standards in § 4.1.~~

~~(6) The test data acquired in (5) above.~~

~~(7) A declaration under penalty of perjury by the person conducting the test that the information contained in items (5) and (6) is true and correct.~~

~~(8) A declaration under penalty of perjury by the applicant setting forth his or her relationship to the cargo tank and stating that all information is true and correct.~~

~~3.3 Information Required by the ARB Executive Officer~~

~~3.3.1 Evidence of Corporate and Financial Responsibility~~

~~The requirements of this section shall apply with equal stringency both to original manufacturers and to rebuilders of vapor recovery equipment.~~

~~3.3.1.1 The ARB Executive Officer, to cover the cost of approving system designs may charge a fee not to exceed the actual cost incurred.~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~3.3.1.2 The ARB Executive Officer, to cover the cost of certifying cargo tanks, may charge a fee not to exceed the actual cost of certification.~~

~~3.3.2 Design~~

~~3.3.2.1 Engineering Drawings~~

~~The applicant shall submit engineering drawings for:~~

~~(1) each prototype vapor recovery system and~~

~~(2) all equipment components of each prototype system.~~

~~For any component, in lieu of a component drawing, the applicant can submit an affidavit declaring:~~

~~(1) the manufacturer's model number for the component and~~

~~(2) the applicant's commitment to maintain, on file, engineering drawings for such component.~~

~~3.3.2.2 List of Components by Manufacturer and Model Number~~

~~The applicant shall submit a list of components by manufacturer and model number for the vapor recovery system.~~

~~3.3.3 Installation, Operation, and Maintenance~~

~~For approval of a vapor recovery system design, a system manual which specifies required installation, operation, and maintenance procedures for the vapor recovery system shall be submitted with the application. A required field training program for maintenance personnel shall be specified in the system manual, including performance specifications for personnel and maintenance procedures.~~

~~3.3.4 Compatibility~~

~~This section specifies vapor recovery system compatibility requirements which, although not specified in terms of vapor recovery effectiveness, form an indispensable basis for proceeding with the application of the appropriate~~

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~~certification and test procedures.~~

~~The installation, operation, and maintenance of vapor recovery equipment must be compatible with:~~

~~(1) the application of performance standards, performance specifications, and test procedures and~~

~~(2) the installation, operation, and maintenance of any other equipment associated with such vapor recovery equipment.~~

~~The design of the vapor recovery system of the cargo tank shall be such that when the cargo tank is connected to an approved underground storage tank vapor recovery system or a vapor recovery system at a bulk plant or terminal it shall not prevent such systems from achieving the required vapor recovery efficiencies. The connectors of the cargo tank shall be compatible with the fittings on the fill pipes at the service stations and gasoline terminals which the cargo tank will service. Such compatibility may be achieved by the use of adapters.~~

~~4 PERFORMANCE STANDARDS, PERFORMANCE SPECIFICATIONS, AND TEST PROCEDURES~~

> ~~**Warning:** The installation, operation, maintenance, and inspection of a vapor recovery system must be compatible with:~~
>
> ~~(1) the application of specified performance standards, performance specifications, and test procedures and~~
>
> ~~(2) the installation, operation, maintenance, and inspection of any other equipment associated with such system.~~

~~4.1 Performance Standards and Test Procedures~~

~~4.1.1 Static Pressure~~

~~4.1.1.1 Five Minute Performance Standard (Yearly)~~

~~The yearly performance standard is expressed as the maximum allowable pressure change in five minutes for a cargo tank which has been either:~~

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~~(1) pressurized to +18 inches water column (gauge) or~~

~~(2) evacuated to -6 inches water column (gauge).~~

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~~Pressure Change per Cargo Tank or Compartment Tested~~	
~~Allowed Pressure Change in Five Minutes (inches water column, gauge)~~	~~Cargo Tank or Compartment Capacity (gallons)~~
~~0.50~~	~~2500 or more~~
~~0.75~~	~~2499 to 1500~~
~~1.00~~	~~1499 to 1000~~
~~1.25~~	~~999 or less~~

~~4.1.1.2 Test Procedures~~

~~Compliance with and violation of the annual certification criterion shall be determined by:~~

~~TP-204.1~~

~~4.1.2 Static Pressure~~

~~4.1.2.1 Performance Standards (Daily)~~

~~Two equivalent performance standards are specified below. It is a permanent condition of certification that cargo tank performance comply with both of these standards.~~

~~The five minute performance standard is specified and tested similarly to the yearly standard, but is based on pressure change from +18 inches water column (gauge) only and is less stringent.~~

~~The one minute performance standard is dependent on the headspace volume after loading, which can vary from one loading to the next.~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~(1) Five Minute Performance Standard (Daily)~~

~~Pressure Change per Cargo Tank or Compartment Tested per TP-204.1~~	
~~Allowed Pressure Change in Five Minutes (inches water column, gauge)~~	~~Cargo Tank or Compartment Capacity (gallons)~~
~~2.5~~	~~2500 or more~~
~~3.0~~	~~2499 to 1500~~
~~3.5~~	~~1499 to 1000~~
~~4.0~~	~~999 or less~~

~~(2) One Minute Performance Standard (Daily)~~

~~Pressure Change per Cargo Tank or Compartment Tested per TP-204.2~~
~~The appropriate one minute performance standard is determined by application of TP-204.2.~~

~~4.1.2.2 Test Procedures~~

~~Compliance with and violation of the static pressure performance standards shall be determined by:~~

~~TP-204.1~~

~~TP-204.2~~

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~~4.1.3 Internal Vapor Valve~~

~~4.1.2.1 Performance Standard~~

~~Every cargo tank shall have an internal vapor valve. A check valve or cap is not an acceptable alternative.~~

~~The opening pressure for any pneumatic internal vapor valve shall be listed in the Executive Order certifying a cargo tank with such a valve. A pressure gauge (0 to 100 psig) shall be installed on any such cargo tank, maintained in good working order, and observed by the operator during as large a fraction of the duration of each delivery as practicable. The operator shall terminate delivery and return for maintenance and repairs if the pressure gauge indicates a pressure below the opening pressure of such a cargo tank's pneumatic internal vapor valve.~~

~~Two equivalent performance standards are specified below. It is a permanent condition of certification that cargo tank performance comply with both of these standards.~~

~~(1) **Five Minute Performance Standard (Yearly)**~~

~~Pressure Change per Cargo Tank or Compartment Tested per TP-204.1~~	
~~Allowed Pressure Change in Five Minutes (inches water column, gauge)~~	~~Cargo Tank or Compartment Capacity (gallons)~~
~~5.0~~	~~all~~

~~(2) **One Minute Performance Standard (Daily)**~~

~~Pressure Change per Cargo Tank or~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~**Compartment Tested per TP-204.2**~~
~~The appropriate one minute performance standard is determined by application of TP-204.2.~~

~~4.1.3.2 Test Procedures~~

~~Compliance with and violation of the internal vapor valve performance standards shall be determined by:~~

~~**TP-204.1**~~

~~**TP-204.2**~~

~~4.1.4 Vapor and Liquid Leaks~~

> ~~**Note:** A cargo tank shall not be required to comply with any leak criteria or performance standards except those that relate directly to the cargo tank; such leaks are "cargo tank leaks"; examples of leaks which are not cargo tank leaks are:~~
>
> ~~(1) leaks involving bulk plant or terminal equipment including~~
>
> ~~(2) leaks from couplings between cargo tank equipment and bulk plant or terminal equipment, unless the coupling was brought into the bulk plant or terminal facility on the cargo tank vehicle..~~
>
> ~~Leaks of types (1) and (2) are not evidence of non-compliance of the cargo tank per this procedure.~~

~~4.1.4.1 Performance Standards~~

~~The performance standards for leak(s) from any cargo tank is that no vapor leak or liquid leak shall occur from any cargo tank according to the following definitions:~~

~~(1) **Vapor Leak**~~

~~A vapor leak is defined to be any source of gasoline vapors which causes a combustible gas detector meter reading exceeding 100 percent of the~~

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~~LEL when measured at a distance of one inch (2.5 cm). A marginal vapor leak may be verified by conducting a pressure/vacuum leak test. A vapor leak does not include any vapor resulting from liquid spitback, spillage, or leakage.~~

~~(a) Probe Distance~~

~~The detector probe inlet shall be 2.5 cm from the potential leak source. The distance can be maintained during monitoring by putting a 2.5 cm extension on the probe tip.~~

~~(b) Probe Movement~~

~~Move the probe slowly (approximately 4 cm/sec). If there is any meter deflection at a potential leak source, move the probe to locate the point of highest meter response.~~

~~(c) Probe Position~~

~~As much as possible, the probe inlet shall be positioned in the path of the vapor flow from a leak so as to maximize the measured concentration.~~

~~(2) **Liquid Leak**~~

~~A liquid leak is defined to be the dripping of liquid organic compounds at a rate in excess of three (3) drops per minute from any single leak source other than the liquid fill line and vapor line disconnect operations. A liquid leak from liquid fill line and vapor line disconnect operations is defined to be:~~

~~(1) more than two (2) milliliters liquid drainage per disconnect from a top loading operation; or~~

~~(2) more than ten (10) milliliters liquid drainage from a bottom loading operation.~~

~~Such liquid drainage for disconnect operations shall be determined by computing the average drainage from three consecutive disconnects at any one permit unit.~~

~~4.1.4.2 Test Procedures~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~Compliance with and violation of the leak performance standards shall be determined using:~~

~~TP-204.3 Determination of Leaks~~

~~4.2 Performance Specifications and Test Procedures~~

~~Performance specifications may be specified by the applicant in the required application information for each component or configuration of components of the vapor recovery system. Such performance specifications shall be the basis for any testing performed on any component or configuration of components when isolated from the rest of the system.~~

~~Other performance specifications shall be added, as appropriate after review of system information by the ARB Executive Officer.~~

~~Per Section 41962 (h) of the Health and Safety Code, Districts shall neither establish more stringent performance specifications nor adopt test procedures for cargo tanks.~~

~~4.3 Performance Standards and Performance Specifications for Novel Systems~~

~~For novel systems, on a case-by-case basis, additional performance standards and performance specifications shall be required based on evaluation by the ARB Executive Officer and a determination of necessity.~~

~~4.4 Test Procedures for Novel Systems~~

~~Novel test procedures shall be required for novel systems based on evaluation by the ARB Executive Officer and a determination of necessity.~~

~~4.4.1 Technical Identification of Need~~

~~The equipment related to any application for certification shall be subject to an engineering evaluation.~~

~~The engineering evaluation may result in a technical identification of need for development of special test procedures for novel systems, components, or applications.~~

~~4.4.2 Administrative Requirement for Development~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~Following any such technical identification of need, the applicant shall be responsible for developing test procedures for the applicant's equipment to demonstrate that such equipment can meet any applicable performance standards or specifications.~~

~~4.4.3 Evaluation and Approval~~

~~Any test procedures identified and developed by the applicant shall be subject to an engineering evaluation which must result in approval by the ARB Executive Officer to meet the requirements of this section.~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~5 EVALUATION AND TESTING OF VAPOR RECOVERY EQUIPMENT~~

~~5.1 General Evaluation and Testing~~

~~Vapor recovery systems shall be subjected to evaluation and testing according to the specified performance standards, performance specifications, and test procedures at the applicant's expense.~~

> ~~**Note:** To avoid the certification of a performance standard or performance specification which can not reasonably be met by all anticipated installations of a certified system, the applicant may specify (a) challenge mode(s) for system testing, subject to approval by the ARB Executive Officer. The ARB Executive Officer shall evaluate each system to determine the need for failure mode testing; and if such need is positively determined the ARB Executive Officer shall specify (a) failure mode(s) for system testing.~~
>
> ~~"Challenge mode testing" is testing conducted with a system installation intentionally modified so that the performance standard is more difficult to meet. The purpose of challenge mode testing is to provide a basis for determining performance specifications which reasonably can be met by all anticipated installations of a certified system.~~
>
> ~~"Failure mode testing" is testing conducted with a system installation intentionally modified so that it fails to meet its performance standard. The purpose of failure mode testing is to provide a basis for determining performance specifications which, when met, provide reasonable assurance that an installation of the system is not in the related failure mode.~~

~~(1) The ARB Executive Officer shall conduct all evaluation and testing unless the ARB Executive Officer determines that the equipment owner or operator shall contract for or conduct specified evaluation and testing on a case-by-case basis.~~

~~(2) All test personnel, regardless of their primary employer, shall be responsible solely to the ARB Executive Officer for the conduct of all testing activities required by this certification procedure. Such testing activities include, but are not limited to:~~

~~(a) collection of data~~

~~(b) calculation of results~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~(c) reporting of results~~

~~(3) The ARB Executive Officer shall be present to monitor all testing and clarify the application of the procedures in novel circumstances; test data, calculations, and reported results shall be subsequently reviewed and evaluated by the ARB Executive Officer to determine their validity for inclusion in the Certification Report.~~

~~5.2 Alternative Evaluation and Testing~~

~~Certification procedures, other than specified above, shall only be used if prior written approval is obtained from the ARB Executive Officer. In order to secure the ARB Executive Officer's approval of an alternative certification procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative certification procedure is equivalent to this certification procedure.~~

~~(1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.~~

~~(2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB Executive Officer's files and shall be made available upon request.~~

~~5.3 Preliminary Evaluation~~

~~A preliminary engineering evaluation shall be performed on each subject vapor recovery system to determine the conditions under which field testing, bench testing, and further engineering evaluation shall be performed.~~

~~Field testing, bench testing and engineering evaluation of subject vapor recovery systems and components shall be conducted in a manner, determined by the ARB Executive Officer, which shows consideration of the difficulties of actual in-use circumstances in which the systems and components are expected to be employed.~~

~~(1) The ARB Executive Officer shall determine any challenge and failure modes necessary to reflect the matrix of actual in-use circumstances expected for all installations of such systems. If such modes are determined, they shall be specified in writing to the applicant.~~

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~~(2) Field testing, bench testing and engineering evaluation shall include any challenge and failure modes for such systems as determined in (1) to provide for performance standards and performance specifications which can be met by the actual use of all installations of such systems.~~

~~5.4 Field Testing~~

~~The ARB Executive Officer shall require field testing for any performance standard or performance specification if, after its evaluation, field testing is the only acceptable alternative.~~

~~5.5 Bench Testing~~

~~The ARB Executive Officer shall require bench testing for any performance standard or performance specification if, after its evaluation, bench testing is necessary and a non testing evaluation alternative is inadequate.~~

~~5.6 Evaluation~~

~~The ARB Executive Officer shall evaluate the results of testing for any performance standard or performance specification.~~

~~The ARB Executive Officer shall conduct a non-testing evaluation, after determining that testing is unnecessary, for any performance standard or performance specification.~~

~~**6 DOCUMENTATION FOR CERTIFICATION**~~

~~A Certification Report shall be prepared, at the applicant's expense, documenting the preceding components:~~

~~(1) Application for Certification~~

~~(2) Standards, Specifications, and Test Procedures~~

~~(3) Evaluation and Testing of the Vapor Recovery System~~

> ~~**Note:** In addition to other required results, vapor recovery system test results shall be reported in units of pounds of hydrocarbon emitted per thousand gallons of fuel transferred for any results which are expressible in such units.~~

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~~The ARB Executive Officer shall consult with the applicant, shall review the report, may require revisions or more work on the components, and shall approve and sign the Certification Report after it is determined that:~~

~~(1) The Certification Report is complete.~~

~~(2) The Certification Report documents successful performance of the subject vapor recovery system according to the performance standards, performance specifications, and test procedures.~~

~~7 CERTIFICATION~~

~~The ARB Executive Officer shall not certify any system until after the system's Certification Report is approved and signed.~~

~~Evidence of certification shall be an ARB Executive Order (which shall reference the Certification Report) signed by the ARB Executive Officer.~~

~~After approval and signature of the ARB Executive Order, Certification Reports shall be maintained in the ARB Executive Officer's files and shall be made available upon request.~~

~~7.1 Variance from Certification Requirements~~

~~7.1.1 Any person who cannot comply with the requirements set forth in § 4 because of unreasonable economic hardship, unavailability of equipment or lack of technological feasibility may apply to the ARB Executive Officer for a variance. The application shall set forth:~~

~~(1) the specific grounds upon which the variance is sought;~~
~~(2) the proposed date(s) by which compliance with the requirements of § 4 will be achieved; and~~
~~(3) a plan reasonably detailing the method by which compliance will be achieved.~~

~~7.1.2 Upon receipt of an application for a variance, the ARB Executive Officer shall hold a hearing to determine whether, and under what conditions and to what extent, a variance from the requirements established by § 4 is necessary and will be permitted. Notice of the time and place of the hearing shall be sent to the applicant by certified mail not less than 30 days prior to the hearing. Notice of the hearing shall also be published in at least one newspaper of general circulation and shall be sent to every person who requests such notice, not less than 30 days prior to the hearing.~~

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~~7.1.3 At least 30 days prior to the hearing the application for the variance shall be made available to the public for inspection. Interested members of the public shall be allowed a reasonable opportunity to testify at the hearing and their testimony shall be considered.~~

~~7.1.4 No variance shall be granted unless all of the following findings are made:~~

~~(1) that the applicant for the variance is, or will be, in violation of the requirements established by § 4;~~

~~(2) that due to unreasonable economic hardship, unavailability of equipment or lack of technological feasibility beyond the reasonable control of the applicant, requiring compliance would result in either:~~

~~(a) an arbitrary or unreasonable taking of property, or~~
~~(b) the practical closing and elimination of a lawful business; and~~

~~(3) that such taking or closing would be without a corresponding benefit in reducing air contaminants.~~

~~7.1.5 Any variance order shall include the date(s) by which compliance with the requirements of § 4 will be achieved and any other condition(s) including, where appropriate, increments of progress, that the ARB Executive Officer, as a result of the testimony received at the hearing, find necessary.~~

~~7.1.6 If the ARB Executive Officer determines that, due to conditions beyond the reasonable control of the applicant, the applicant needs an immediate variance from the requirements established by § 4, the ARB Executive Officer may hold a hearing without complying with the provisions of § 7.1.2 or § 7.1.3 above.~~

~~No variance granted under the provisions of this subparagraph may extend for a period of more than 45 days. The ARB Executive Officer shall maintain a list of persons who in writing have informed the ARB Executive Officer of their desire to be notified by telephone in advance of any hearing held pursuant to this section, and shall provide advance telephone notice to any such person.~~

~~7.1.7 Upon the application of any person, the ARB Executive Officer may review and for good cause modify or revoke any variance from the requirements of § 4 after holding a hearing in accordance with the provisions of this section.~~

~~7.2 Requirements for Keeping Documents with Cargo Tank~~

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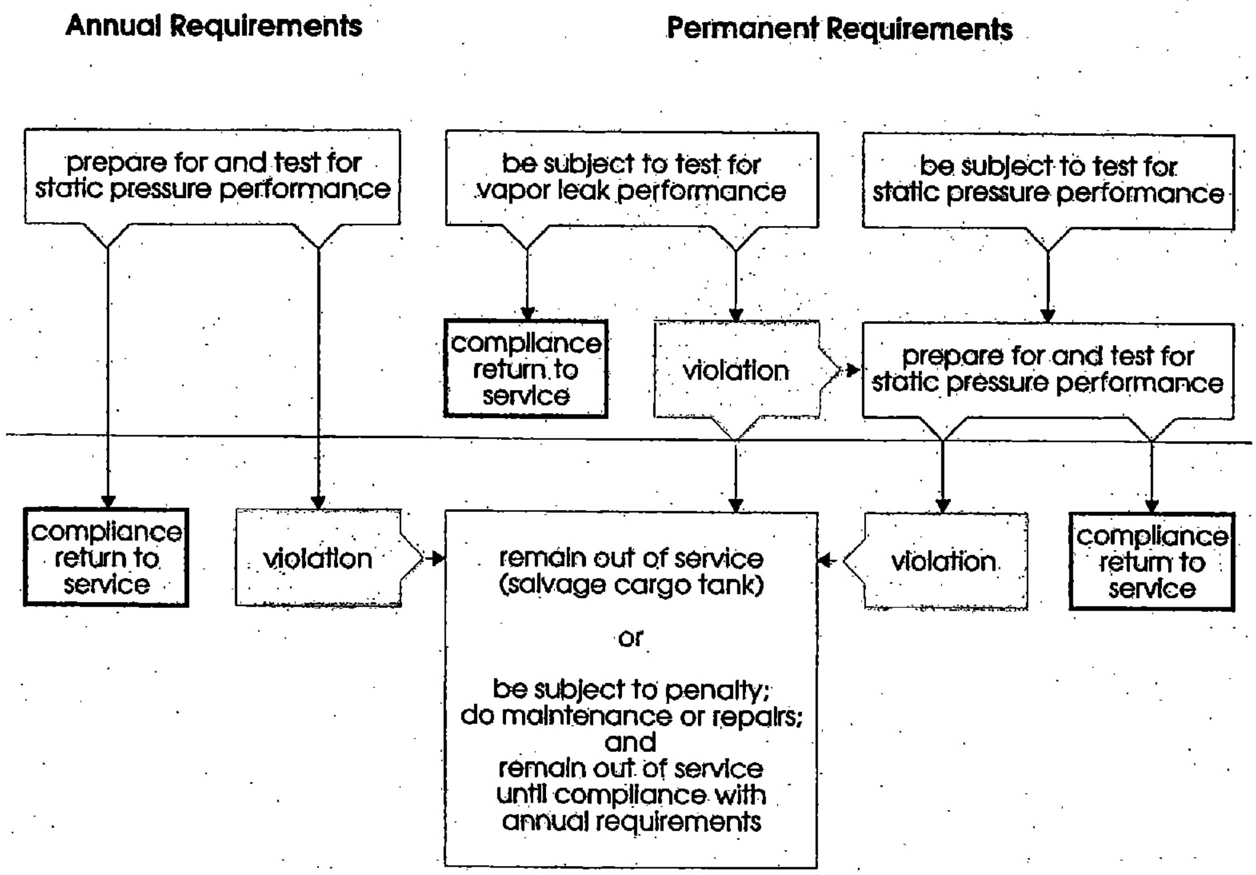
~~FLOWCHART~~

~~Requirements for Determinations of Compliance and Violation~~



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~~7.3.2.1 Yearly Requirements~~

~~(1) On a yearly basis, each cargo tank shall prepare for pressure testing to determine if that cargo tank complies with the yearly standard according to the appropriate test procedure (§ 4).~~

~~(2) Any such cargo tank which fails to demonstrate such compliance shall be subject to a penalty set by the ARB Executive Officer. (See H&SC Section 41974.)~~

~~(3) Any such cargo tank which fails to demonstrate compliance shall be taken out of service until such cargo tank is repaired, tested, and determined to comply.~~

~~7.3.2.2 Permanent Requirements~~

~~(1) On a permanent basis, any cargo tank shall be subject to leak testing to determine if any such cargo tank complies with the performance standards for leaks (§ 4).~~

~~Any such cargo tank which fails to demonstrate such compliance shall prepare for pressure testing pending one of the following outcomes:~~

~~(a) If no maintenance has been performed on such cargo tank while preparing for testing, such cargo tank may be tested to determine if such cargo tank complies with a static pressure performance standard according to the appropriate test procedure (§ 4).~~

~~(i) If such cargo tank complies, such cargo tank may be placed back in service with no penalty.~~

~~(ii) If such cargo tank does not comply, such cargo tank shall be subject to a penalty set by the ARB Executive Officer (see H&SC Section 41974) and shall remain out of service until such cargo tank is repaired, tested, and determined to comply with a static pressure performance standard according to the appropriate test procedure (§ 4).~~

~~(b) If maintenance has been performed on such cargo tank while preparing for testing, such cargo tank shall be permanently removed from service (salvaged) or shall be tested to determine if such cargo tank complies with the yearly standard according to the appropriate test procedure (§ 4).~~

~~(i) If such cargo tank complies, such cargo tank may be placed back in~~

NOTE: ENTIRE TEXT OF THIS PAGE IS PROPOSED FOR REPEAL

~~service and shall be subject to a penalty set by the ARB Executive Officer. (See H&SC Section 41974.)~~

~~(ii) If such cargo tank does not comply, such cargo tank shall be subject to a penalty set by the ARB Executive Officer (see H&SC Section 41974) and shall remain out of service until such cargo tank is repaired, tested, and determined to comply with the yearly standard according to the appropriate test procedure (§ 4).~~

~~(c) If the cargo tank is taken out of service permanently, such cargo tank shall be subject to a penalty set by the ARB Executive Officer. (See H&SC Section 41974.)~~

~~(2) On a permanent basis, any cargo tank may be placed in preparation for pressure testing and shall be subject to static pressure performance testing to determine if any such cargo tank complies with a static pressure performance standard (§ 4).~~

~~(a) Any such cargo tank which fails to demonstrate such compliance shall be subject to a penalty set by the ARB Executive Officer (see H&SC Section 41974) and shall be taken out of service.~~

~~(b) Such cargo tank may be repaired and re-tested to determine if such cargo tank complies with the annual certification standard according to the appropriate test procedure (§ 4).~~

~~(i) If such cargo tank complies, the cargo tank may be placed back in service.~~

~~(ii) If such cargo tank does not comply, the cargo tank shall remain out of service until the cargo tank is repaired, tested, and determined to comply with the yearly according to the appropriate test procedure (§ 4).~~

~~7.3.2.3 Requirements in Preparation for Pressure Testing~~

~~The requirement for an internal vapor valve must be met in preparation for pressure testing.~~

~~Any cargo tank which is in preparation for pressure testing as required by § 7.3.2.1 (1), § 7.3.2.2 (1), or § 7.3.2.2 (2), shall prepare in one of the following ways:~~

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> ~~**Warning:** Under no circumstances shall the vapors in any cargo tank be purged or vented directly to the atmosphere. The only exception to this shall be for airport refuelers, which may purge or vent directly to the atmosphere, so long as no safety or ire regulations are violated.~~
>
> ~~"Airport refueler" is defined as a cargo tank which: has a total capacity no greater than 5,000 gallons; exclusively transports avgas and jet fuel; and is not licensed for public highway use.~~
>
> ~~The airport refueler exception terminates when there are two CARB-certified degassing vapor control systems which are appropriate for degassing airport refuelers.~~

~~(1) Five Minute Pressure Testing (TP-204.1)~~

~~(a) If such cargo tank contains product for delivery, such cargo tank shall deliver until empty; then~~

~~(b) Such cargo tank shall purge by a method not in violation of any regulations, including but not limited to:~~

~~(i) purging with air to an incinerator certified by the ARB or permitted by a District;~~

~~(ii) purging with water to an ARB certified vapor recovery system at a bulk plant or terminal which shall recover the purge water in conformity with all applicable regulations;~~

~~(iii) purging with a liquid with a vapor pressure of less than four pounds Reid (<4 psi RVP) to an ARB certified vapor recovery system at a bulk plant of terminal; then~~

~~(c) Such cargo tank shall be empty.~~

~~(d) Such cargo tank shall adhere to the PRE-TEST PROTOCOL of (TP-204.1).~~

~~(2) One Minute Pressure Testing (TP-204.2)~~

~~Such cargo tank shall adhere to the PRE-TEST PROTOCOL of (TP-204.2).~~

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~~7.3.2.4 Requirements at Conclusion of Pressure Testing~~

~~The entire cargo tank, including tank, domes, dome vents, piping hose connections, adaptors, couplings, hoses and delivery elbows shall be inspected for evidence of wear, damage, or misadjustment that could be a potential leak source. Any part found to be defective shall be adjusted, repaired or replaced as necessary~~

California Environmental Protection Agency

Air Resources Board

{PROPOSED}

Vapor Recovery Certification Procedure

CP-204

Certification Procedure for Vapor Recovery Systems of Cargo Tanks

Adopted: April 18, 1977
Amended: September 1, 1982
Amended: February 24, 1984
Amended: April 12, 1996
Amended: March 17, 1999
Amended: [Insert Amendment Date]

Note: This Certification Procedure is being amended. For ease of viewing, the procedure is shown as repealed and proposed text.

California Environmental Protection Agency
Air Resources Board

Vapor Recovery Certification Procedure

CP-204

Certification Procedure for Vapor Recovery Systems of Cargo Tanks

A set of definitions common to all Certification and Test Procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purposes of this procedure, the term "ARB" or "CARB" refers to the California Air Resources Board and the term "Executive Officer" refers to the ARB Executive Officer or his or her authorized representative or designee.

1. GENERAL INFORMATION AND APPLICABILITY

This procedure describes the process for certifying cargo tanks with a system that recovers vapors during the loading and unloading of gasoline. The cargo tank vapor recovery system prevents gasoline vapors from being emitted into the air.

Other vapor recovery certification procedures provide instructions for determining performance standards, performance specifications, and test procedures for equipment which recovers vapors emitted in association with gasoline marketing operations involving: dispensing facilities (CP-201 or CP-206); bulk plants and cargo tanks (CP-202); and supply lines, terminals, delivery lines, and cargo tanks (CP-203). This procedure establishes performance standards or specifications for cargo tanks, including trucks and trailers that transport gasoline. State law provides that no person shall operate, or allow the operation of, a cargo tank unless the cargo tank is certified and maintained in accordance with these procedures. Certifications shall be issued on an annual basis and shall expire on the last day of the month one year following the month of issuance of the certification.

1.1 Legislative and Regulatory Requirements of Other Agencies

In addition to ARB, other federal, state, or local government bodies may enforce laws and regulations applicable to vapor recovery systems. Cargo tank owners or operators are responsible for complying with all applicable laws and regulations including regulations of the California Highway Patrol, the Department of Forestry and Fire Protection, Office of the State Fire Marshal, and the Department of Industrial Relations, Division of Occupational Safety and Health.

2. SUMMARY OF CERTIFICATION PROCESS

The owner or operator of any cargo tank shall:

(1) annually test such cargo tank(s) in accordance with the provisions of section (§) 3.1 and
(2) annually apply for certification of such tank(s) in accordance with this certification procedure.

Tests shall be conducted by the owner or operator of the cargo tank, or a consultant or contractor, at the expense of the owner or operator. Prior to testing, the owner or operator shall notify the Executive Officer, no less than 48 hours prior to the start of test, of the date, time, and location of the test. The Executive Officer may observe or conduct tests referenced in § 3.1.

2.1 Application for Certification of an Individual Cargo Tank

The application for certification of individual cargo tanks shall be submitted to the Executive Officer through the ARB Online Cargo Tank Vapor Recovery Certification Program that can be accessed through the ARB webpage at www.arb.ca.gov/enf/cargotanks/cargotanks.htm, and shall contain the following information:

1. Name, address, email address, and telephone number of owner or operator, and company name (if applicable).
2. The sizes and number of compartments of the cargo tank.
3. The cargo tank number issued by CARB.
4. A statement that the tank has been tested according to the annual test procedures prescribed in § 3.1 of this certification procedure and complies with the corresponding performance standards.
5. The test data acquired in (4) above.
6. A declaration under penalty of perjury by the person conducting the test that the information contained in items (5) and (6) is true and correct.
7. A declaration under penalty of perjury by the applicant setting forth his or her property interest in the cargo tank and stating that all information is true and correct.

2.2 Compatibility

The cargo tank when connected to an ARB certified vapor recovery system at a bulk plant, terminal, gasoline dispensing facility (GDF) with an underground storage tank (UST), or GDF with an aboveground storage tank (AST) shall not prevent such systems from achieving the required vapor recovery efficiency and/or emission factor referenced in CP-202 for bulk plants, CP-203 for terminals, CP-201 for GDF with UST, and CP-206 for GDF with AST. The connectors and fittings of the cargo tank shall be compatible with an ARB certified Phase I system installed at GDFs with USTs and ASTs. Such compatibility may be achieved by the use of adapters.

2.3 Condition of Certification

When the Executive Officer determines the application complies with all applicable provisions of this certification procedure, the Executive Officer shall issue a non-transferable and non-removable decal to be affixed to the right side of the cargo tank on the vertical mid-line, near the front of the vessel. Furthermore, the owner/operator shall ensure that the ARB issued Cargo Tank Number for the vessel shall be on the cargo tank in a location that can be readily seen. As a condition of certification, the Executive Officer shall return a copy of the application to the applicant with stamped acknowledgement of receipt thereon, or other appropriate documentation of certification. The stamped copy of the application or other documentation of certification shall be kept with the cargo tank at all times.

2.4 Fee

The Executive Officer shall charge a fee not to exceed the actual cost of certification to cover the cost of certifying cargo tanks. Payment of the fee is a condition of certification.

3. PERFORMANCE STANDARDS AND TEST PROCEDURES

3.1 Five Minute Performance Standard - Annual

All cargo tanks owner or operators shall conduct testing annually in accordance with TP-204.1, Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks, to verify compliance with performance standards referenced in this section. The results shall be submitted annually to the Executive Officer as provided by section 2.

3.1.1 Cargo Tanks or Compartment

The Five Minute performance standard listed in Table 3-1 shall be determined by TP-204.1, Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks.

Table 3-1
Pressure or Vacuum Change per Cargo Tank
or Compartment Tested

Allowed Pressure Change (inches WC)	Cargo Tank or Compartment Capacity (gallons)
0.50	2500 or more
0.75	2499 to 1500
1.00	1499 to 1000
1.25	999 or less

Table 3-2
Internal Vapor Valve Pressure Change
Per Cargo Tank or Compartment Tested

Allowed Pressure Change In 5 Minutes (inches WC)	Cargo Tank Or Compartment Capacity (gallons)
5.0	All

3.1.2 Internal Vapor Valve

Every cargo tank shall have an internal vapor valve. A check valve or cap is not an acceptable alternative. The internal vapor valve shall comply with the performance standard listed in Table 3-2 when tested in accordance with TP-204.1.

3.2 Daily Static Pressure Performance Standard

The Executive Officer shall conduct testing of cargo tanks in accordance with TP-204.2, Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks, to determine compliance with applicable performance standards referenced in section 3.2.

3.2.1 The Daily Static Pressure Performance Standard, or one minute standard, is dependent on the headspace volume after loading and can vary from one load to the next. The one minute standard shall be determined by TP-204.2. All cargo tanks and compartment, including the internal vapor valve(s), shall be capable of meeting the one minute standard of Equation 3.2.

Equation 3.2

$$P_F = 18\left(\frac{N}{18}\right)^{\left(\frac{V_s}{5V_h}\right)}$$

where:

P_F minimum allowable one-minute final pressure, inches water column
V_s total cargo tank shell capacity, gallons
V_h cargo tank headspace volume after loading, gallons
18 initial pressures at start of test, inches water column
N see Table 3.2.1

Table 3.2.1

If V_s is	Then N is equal to
greater than or equal to 2,500 gallons	15.5 inches WC
between 1,500 and 2499 gallons	15.0 inches WC
between 1,000 and 1,499 gallons	14.5 inches WC
between 0 and 999 gallons	14.0 inches WC

3.2.2 Internal Vapor Valve Performance Standard

All cargo tank internal vapor vent valve(s) shall comply with the performance standard listed in Table 3.2.2 as determined by TP-204.2.

Table 3.2.2
Internal Vapor Valve Performance Standard

Test Time (minutes)	Maximum Allowable One-Minute Pressure Increase (inches WC)
1.0	1.1
2.0	2.2
3.0	3.3
4.0	4.4
5.0	5.5

The values in the right hand column are adjusted upward to account for a systematic bias caused by expansion in the headspace of the cargo tank subsequent to thermal conduction from the shell. The value of 5.5 at the bottom of the column corresponds equivalently to the 5.0 inches WC pressure increase allowed by the five minute performance standard.

Important: If individual compartments are to be tested, both V_s and V_h must be the volumes relating to that compartment alone, not all compartments.

3.3 Vapor and Liquid Leaks

The Executive Officer shall conduct testing of cargo tanks during the loading or after loading of gasoline to determine compliance with the vapor and liquid leak standards of this section in accordance with TP-204.3, Determination of Leak(s).

3.3.1 Vapor Leaks

A vapor leak is defined to be any source of gasoline vapors which causes a combustible gas detector meter reading exceeding 100 percent of the LEL as determined by TP-204.3, Determination of Leak(s).

3.3.2 Liquid Leaks

A liquid leak is defined to be liquid gasoline dripping at a rate in excess of three (3) drops per minute as determined by TP-204.3.

4. REQUIREMENTS FOR DETERMINATIONS OF COMPLIANCE AND VIOLATION

The specifications of this section are primarily adopted pursuant to Health and Safety Code sections (H&SC §§ 41962 and 41974). In particular, H&SC § 41974 provides that the penalty provisions of Article 3 (commencing with Section 42400) of Chapter 4, Division 26 of the H&SC shall apply to gasoline cargo tank vapor recovery system violations.

4.1 General Requirements

It is a general requirement that any certified vapor recovery system shall comply with the specifications of certification which result from the application of this procedure to such vapor recovery system. Failure of such vapor recovery system to comply is a violation of such vapor recovery system's specifications of certification.

4.2 Specific Requirements

It shall be a specification of certification that each cargo tank shall comply with the compliance requirements listed below; failure of a cargo tank to comply with these requirements shall be a violation of that cargo tank's specification of certification.

4.2.1 Yearly Requirements

a. On an annual basis, each cargo tank shall prepare for pressure testing to determine if that cargo tank complies with the five minute performance standard as determined by TP-204.1.
b. Any such cargo tank which fails to demonstrate such compliance with five minute performance standard, daily static pressure performance standard, or vapor leak standard or liquid leak standard shall be subject to a penalty set by the Executive Officer. (See H&SC § 41974)
c. Any such cargo tank which fails to demonstrate compliance shall be taken out of service until such cargo tank is repaired, tested, and determined to comply.

4.2.2 Daily Requirements

a. On a permanent basis, any cargo tank shall be subject to daily static pressure performance standard testing.

Any such cargo tank which fails to demonstrate such compliance shall prepare for pressure testing pending one of the following outcomes:

(1) If no maintenance has been performed on such cargo tank while preparing for testing, such cargo tank may be tested to determine if such cargo tank complies with a static pressure performance standard according to the appropriate test procedure.

i. If such cargo tank complies, such cargo tank may be placed back in service with no penalty.

ii. If such cargo tank does not comply, such cargo tank shall be subject to a penalty set by the Executive Officer (see H&SC § 41974) and shall remain out of service until such cargo tank is repaired, tested, and determined to comply with the annual Five Minute Performance Standard as determined by TP-204.1.

(2) If maintenance has been performed on such cargo tank while preparing for testing, such cargo tank shall be permanently removed from service (salvaged) or shall be tested to determine if such cargo tank complies with the yearly standard according to the appropriate test procedure.

i. If such cargo tank complies, such cargo tank may be placed back in service and shall be subject to a penalty set by the Executive Officer. (See H&SC § 41974)

ii. If such cargo tank does not comply, the owner or operator of the cargo tank shall be subject to a penalty set by the Executive Officer (see H&SC § 41974) and shall remain out of service until such cargo tank is repaired, tested, and determined to comply with the yearly standard according to the appropriate test procedure.

(3) If the cargo tank is taken out of service permanently, such cargo tank shall be subject to a penalty set by the Executive Officer. (See H&SC § 41974)

4.3 Other Requirements

On a permanent basis, any cargo tank shall be subject to annual and daily static pressure performance testing to determine if any such cargo tank complies with the applicable annual and daily static pressure performance standards.

4.3.1 Any such cargo tank which fails to demonstrate such compliance shall be subject to a penalty set by the Executive Officer (see H&SC 41974) and shall be taken out of service.

4.3.2 Such cargo tank may be repaired and re-tested to determine if such cargo tank complies with the annual certification standard according to the appropriate test procedure.

a. If such cargo tank complies, the cargo tank may be placed back in service.

b. If such cargo tank does not comply, the cargo tank shall remain out of service until the cargo tank is repaired, tested, and determined to comply with the annual performance standard listed in section 3.1 of this procedure.

5. ALTERNATE TEST PROCEDURES

Test procedures other than those specified in this certification procedure shall be used only if prior written approval is obtained from the Executive Officer. A test procedure is a methodology used to determine, with a high degree of accuracy, precision, and reproducibility, the value of a specified parameter. Once the test procedure is conducted, the results are compared to the applicable performance standard to determine the compliance status of the facility.

5.1 Alternate Test Procedures for Certification Testing

The Executive Officer shall approve, as required, those procedures necessary to verify the proper performance of the system.

5.2 Request for Approval of Alternate Test Procedure

Any person may request approval of an alternative test procedure. The request shall include the proposed test procedure, including equipment specifications and, if appropriate, all necessary equipment for conducting the test. If training is required to properly conduct the test, the proposed training program shall be included.

5.3 Response to Request

The Executive Officer shall respond within fifteen (15) days of receipt of a request for approval and indicating that a formal response will be sent within sixty (60) days. If the Executive Officer determines that an adequate evaluation cannot be completed within the allotted time, the Executive Officer shall explain the reason for the delay, and will include the increments of progress such as test protocol review and comment, testing, data review, and final determination. If the request is determined to be incomplete or unacceptable, the Executive Officer shall respond with identification of any deficiencies. The Executive Officer shall issue a determination regarding the alternate procedure within sixty (60) days of receipt of an acceptable request.

5.4 Testing of Alternate Test Procedures

All testing to determine the acceptability of the alternate procedure shall be conducted by the Executive Officer or by a third party responsible to and under the direction and control of Executive Officer. Testing shall be conducted in accordance with the written procedures and instructions provided by the Executive Officer. The testing shall, at a minimum, consist of nine sets of data pairs, pursuant to U.S. Environmental Protection Agency (EPA) Reference Method 301, "Field Validation of Pollutant Measurement Methods from Various Waste Media", 40 CFR Part 63, Appendix A, 57

Federal Register page 61992. Criteria established in U.S. EPA Reference Method 301 shall be used to determine whether equivalency between the two test methods exists. For situations where Method 301 is not directly applicable, the Executive Officer shall establish equivalence based on the concepts of comparison with the established method and statistical analysis of bias and variance. Method approval of the procedure shall be granted, on a case-by-case basis, only after all necessary testing has been conducted. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval may or may not be granted in subsequent cases without a new request for approval and additional testing to determine equivalency. If, after approval is granted, subsequent information demonstrates that equivalency between the two methods no longer meets the U.S. EPA Reference Method 301 requirements or the equivalent method established by the Executive Officer, the alternate status of the procedure shall be revoked by the Executive Officer.

5.5 Documentation of Alternate Test Procedures

Any such approvals for alternate test procedures and the evaluation testing results shall be maintained in the Executive Officer's files and shall be made available upon request. Any time an alternate procedure and the reference procedure are both conducted and yield different results, the results determined by the reference procedure shall be considered the true and correct results.

APPENDIX F

Proposed Amendments to TP-204.1: Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

California Environmental Protection Agency

Air Resources Board

{PROPOSED}

Vapor Recovery Test Procedure

TP-204.1

Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

Adopted: April 12, 1996
Amended: March 17, 1999
Amended: [insert Amendment Date]

Note: The text is shown in ~~strikeout~~ to indicate that it is proposed for deletion and underline to indicate that it is proposed for addition. [Bracketed text] is not part of the proposed amendments.

California Environmental Protection Agency
Air Resources Board

Vapor Recovery Test Procedure

TP-204.1

Determination of
Five Minute Static Pressure Performance of
Vapor Recovery Systems of Cargo Tanks

1 APPLICABILITY

Definitions common to all certification and test procedures are in:

D-200 Definitions for ~~Certification Procedures and Test Procedures for~~ Vapor Recovery Procedures ~~Systems~~

For the purpose of this procedure, the term "ARB" or "CARB" refers to the ~~State of~~ California Air Resources Board, and the term "~~ARB~~Executive Officer" refers to the Executive Officer of the ARB or his or her authorized representative or designee~~designate~~.

1.1 General Applicability

This procedure is used to determine compliance with ~~applies to the determination of~~ the five minute static pressure performance standard referenced in Certification Procedure 204 (CP-204), Certification Procedure for Vapor Recovery Systems of Cargo Tanks. ~~of a vapor recovery system of a cargo tank by fluid mechanical principles.~~ This procedure may be used ~~applies~~ to determine ~~any vapor emissions~~the five minute static pressure associated with the dispensing of any fluid, although it is written to reflect application to the hydrocarbon vapors associated with the dispensing of gasoline.

~~1.2 Determinations of Compliance and Violation~~

~~Determinations of certain modes of compliance with and violation of certification specifications are outlined in § 9.~~

~~1.3 Modifications~~

~~Modification of this procedure may be necessary for vapors and fluids other than~~

~~the hydrocarbon vapors associated with the dispensing of gasoline.~~

~~Any modification of this method shall be subject to approval by the ARB Executive Officer.~~

2 PRINCIPLE AND SUMMARY OF TEST PROCEDURE

The cargo tank, mounted on either the truck or trailer, is pressurized to 18 inches water column (WC) and then allowed to decay for five (5) minutes. Similarly in a separate test, the cargo tank is evacuated to negative six (-6) inches WC and then allow to decay for five (5) minutes. The acceptability of the final pressure or vacuum level is based on the capacity of the cargo tank and is listed in CP-204. The performance of the cargo tank internal vapor valve can be determined by pressurizing the cargo tank to 18 inches WC and then closing the internal vapor valves. The system is then allowed to decay for five (5) minutes. The acceptability of final pressure level for the internal vapor valve is listed in CP-204. ~~to be tested in a location where it will be protected from direct sunlight. The cargo tank, mounted on either the truck or trailer, is to be pressurized, isolated from the pressure source, and the pressure drop recorded to determine the rate of pressure change. A vacuum test (for annual certification criterion testing only) is to be conducted in the same manner. Annual recertification tests shall be conducted no more than sixty days prior to the issuance of the certification.~~

3 BIASES AND INTERFERENCES

~~This section is reserved for future specification.~~Thermal expansion due to direct sunlight on an exposed cargo tank can bias the results of this test procedure. Keep 100 percent of the length of the vapor space of a cargo tank in shade during testing.

~~4 SENSITIVITY, RANGE, AND PRECISION~~

~~This section is reserved for future specification.~~

4~~5~~ EQUIPMENT

4~~5~~.1 Source of air or inert gas capable of pressurizing tanks to 27.7 inches of water (1 psi) above atmospheric pressure.

4~~5~~.2 Low pressure (5 psi divisions) regulator for controlling pressurization of tank.

4~~5~~.3 Water manometer, or equivalent, with 0 to 25 inch range, with scale readings of 0.1 inch.

4~~5~~.4 Test cap for vapor line with a shut-off valve for connection to the pressure and vacuum supply hoses. The test cap is to be equipped with a tap for connecting the manometer.

4~~5~~.5 Caps for liquid delivery line.

4~~5~~.6 Vacuum pump of sufficient capacity to evacuate tank to ten inches of water.

4~~5~~.7 Pressure and vacuum supply hose of 1/4 inch internal diameter.

4~~5~~.8 In-line, pressure vacuum relief valve set to activate at one (1) psi and with a capacity equal to the pressurizing or evacuating pumps.

~~6 CALIBRATION PROCEDURE~~

~~This section is reserved for future specification.~~

5~~7~~ PRE-TEST PROTOCOL

5.1 The requirement that each compartment shall have its internal vapor valve must be met to conduct this test.

5.2 The following shall be performed for all cargo tanks subject to testing in accordance with this test procedure:

5.2.1 Cargo tank and trailers shall be empty of gasoline or product to conduct this test.

Warning: Under no circumstances shall the vapors in any cargo tank be purged or vented directly to the atmosphere.

5.2.2 Cargo tank shall be purged by one of the following methods:

(a) Air from the purged cargo tank shall be routed to an incinerator that is certified by ARB and permitted by a district.

(b) Cargo tank vapors shall be routed an ARB certified vapor recovery system at a bulk plant or terminal when water is used to purge the cargo tank. The water can be reused. If the water is disposed, it shall conform to all applicable federal, state, and local regulations.

(c) Cargo tank vapors shall be routed to an ARB certified vapor recovery system at a bulk plant or terminal when a liquid with a vapor pressure of less than four pounds Reid Vapor Pressure (<4 psi RVP) is used to purge the cargo tank.

(d) Any purging method or system approved in writing by the Executive Officer.

~~The cargo tank shall adhere to all of the other certification conditions in CP-204 (in addition to those requirements of CP-204 to which this test procedure applies).~~

6~~8~~ TEST PROCEDURE

~~This procedure does not apply unless pressurized air lines or other equipment penetrate the cargo tank headspace.~~This test shall be conducted with product hoses and vapor hoses connected and exposed to the pressurized cargo tanks or compartments. The cargo tank shall meet the standards for all three tests in consecutive runs.

6~~8~~.1 Static Pressure Performance, Positive Pressurization

~~8.1.1 Static Pressure Performance Measurement~~

6~~8~~.1.1~~.1~~ Open and close the dome covers.

6~~81~~.1.2 Connect static electrical ground connections to tank. Attach the delivery and vapor hoses, remove the delivery elbows and plug the liquid delivery fittings.

6~~8~~.1.~~1.~~3 Attach the test cap to the vapor recovery line of the cargo tank.

6.~~8~~1.4 Connect the vacuum and pressure supply hose and the pressure-vacuum relief valve to the shut-off valve. Attach the pressure source to the hose. Attach a manometer to the pressure tap.

6~~8~~.1~~.1~~.5 Connect compartments of the tank internally to each other if possible.

6~~8~~.1.6 Applying air pressure slowly, pressurize the tank, or alternatively the first compartment, to 18 inches WC~~of water~~.

6~~8~~.1.~~1~~.7 Close the shut-off valve, allow the pressure in the cargo tank to stabilize (adjust the pressure if necessary to maintain 18 inches WC~~of water~~), record the time and initial pressure.

6~~8~~.1.~~1~~.8 At the end of five minutes, record the final time and pressure.

6~~8~~.~~1~~.2.9 ~~Pressure Change from (+18) Inches of Water, Gauge8.1.2.1~~ Calculate and record the pressure change (inches WC~~water column~~) between ~~from~~ initial pressure of+18 inches WC~~of water, gauge, to~~ and the final pressure.

6~~8~~.1.~~2.2.~~10 Repeat sections 6.1.6 through 6.1.9 for each compartment if they are ~~f~~not interconnected.

6~~8~~.2 Static Pressure Performance, Vacuum Test (Negative Pressurization)

~~This procedure does not apply unless pressurized air lines or other equipment penetrate the cargo tank headspace.~~

~~8.2.1 Static Pressure Performance Measurement~~

6~~8~~.2.~~1~~.1 Connect vacuum source to pressure and vacuum supply hose referenced in section 6.1.4.

6~~8~~.2.~~1~~.2 Slowly evacuate the tank, or alternatively the first compartment, to - six (6) inches WC ~~of water~~ vacuum. Close the shut-off valve, allow the pressure in the cargo tank to stabilize (adjust the pressure if necessary to maintain a vacuum or negative six (-6) inches WC ~~of water vacuum~~), and record the initial pressure and time. At the end of five (5) minutes, record the final pressure and time.

6~~8~~.2.~~2~~.3 ~~Pressure Change from (-6) Inches of Water, Gauge~~Calculate and record the pressure change (inches WC ~~water column~~) from the initial -6 inches of WC ~~water, gauge, to~~and the final pressure.

6.2.4 Repeat sections 6.2.2 to 6.2.3 for each compartment if they are not interconnected.

6~~8~~.3 Internal Vapor Valve Performance, Positive Pressurization

6~~8~~.3.1 ~~Static Pressure Performance Measurement8.3.1.1~~ After completing the vacuum and pressure tests (section 6.1 and 6.2), pressurize the tank as in section 6~~8~~.1.6 ~~above~~ to 18 inches WC~~of water~~.

6~~8~~.3~~.1~~.2 Close the cargo tank's internal valve(s) ~~including the internal vapor valve(s),~~ thereby isolating the vapor return line and manifold from the cargo tank.

6~~8~~.3~~.1~~.3 Relieve the pressure in the vapor return line to atmospheric pressure.

6~~8~~.3~~.1~~.4 Seal the vapor return line and after five (5) minutes record the final gauge pressure existing in the vapor return line and manifold.

6~~8~~.3.~~2~~5 ~~Pressure Change from (+18) Inches of Water, Gauge~~Calculate the pressure change (inches WC~~water column~~) from + 18 inches WC~~of water, gauge,~~ to the final pressure.

7. REQUIREMENTS AT CONCLUSION OF PRESSURE TESTING

The entire cargo tank, including tank, domes, dome vents, piping hose connections, adaptors, couplings, hoses and delivery elbows shall be inspected for evidence of wear, damage, or maladjustment that could be a potential leak source. Any part found to be defective shall be adjusted, repaired or replaced as necessary.

~~9 DETERMINATIONS OF COMPLIANCE AND VIOLATION~~

~~Determinations of certain modes of compliance with and violation of certification specifications are outlined below.~~

~~9.1 Static Pressure Performance Standard~~

~~9.1.1 Determination of Compliance~~

~~Compliance is determined if the pressure change from ' 8.1.2 or ' 8.2.2 is equal to or less than the limit specified in CP 204 ' 4.1.1.1.~~

~~9.1.2 Determination of Violation~~

~~Violation is determined if the pressure change from ' 8.1.2 or ' 8.2.2 is greater than the limit specified in CP-204 ' 4.1.1.1.~~

~~9.2 Internal Vapor Valve Performance Standard~~

~~9.2.1 Determination of Compliance~~

~~Compliance is determined if the pressure change from ' 8.3.2 is equal to or less than the limit specified in CP-204 ' 4.1.3.1.~~

~~9.2.2 Determination of Violation~~

~~Violation is determined if the pressure change from ' 8.3.2 is greater than the limit specified in CP-204 ' 4.1.3.1.~~

~~10 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)~~

~~This section is reserved for future specification.~~

~~11 RECORDING DATA~~

~~This section is reserved for future specification.~~

~~12 CALCULATING RESULTS~~

~~This section is reserved for future specification.~~

8~~13~~ REPORTING RESULTS

Results for a given cargo tank shall be reported by the company responsible for testing as listed on the 48 hour test notification that was submitted to the Board. Results can be submitted through the ARB Online Cargo Tank Vapor Recovery Certification Program that can be accessed through the ARB webpage at www.arb.ca.gov/enf/cargotanks/cargotanks.htm. ~~This section is reserved for future specification~~

9~~14~~ ALTERNATE~~IVE~~ TEST PROCEDURES

9.1 U.S. EPA Method 27

U.S. EPA Method 27 referenced in the Code of Federal Regulations – Title 40, Chapter I, Subchapter C, Part 63, Subpart R, section 63.425(e)1 may

1 As last amended on December 19, 2003.

be used an alternate to the procedure described in Section 6 with the following exceptions:

a. The purging of vapor from cargo tanks and compartments shall be conducted in accordance with section 5.

b. Results of each test conducted shall comply with the performance standards reference in section 3.1 CP-204 without taking the arithmetic mean of two successive results as allowed by section 40 CFR 63.42(e)

c. Results from three consecutive tests (pressure, vacuum, and internal vapor valve) run in any sequence shall comply with performance standards reference in section 3.1 of CP-204.

9.2 Other Alternate Test Procedures

This test procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the Executive Officer, pursuant to section 5 of Certification Procedure 204 (CP-204). ~~Test procedures, other than specified in this test procedure or in CP 204 above, shall only be used if prior written approval is obtained from the ARB Executive Officer. In order to secure the ARB Executive Officer's approval of an alternative test procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative test procedure is equivalent to this test procedure.~~

~~(1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.~~

~~(2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB Executive Officer's files and shall be made available upon request.~~

~~15 REFERENCES~~

~~This section is reserved for future specification.~~

~~16 FIGURES~~

~~This section is reserved for future specification.~~

APPENDIX G

Proposed Amendments to TP-204.2: Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

California Environmental Protection Agency

Air Resources Board

<u>{PROPOSED}</u>

Vapor Recovery Test Procedures

TP-204.2

Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

Adopted: April 12, 1996
Amended: March 17, 1999
<u>Amended [Insert Amendment Date]</u>

<u>Note: The text is shown in</u> ~~strikeout~~ <u>to indicate that it is proposed for deletion and underline to indicate that it is proposed for addition. [Bracketed text] is not part of the proposed amendments.</u>

California Environmental Protection Agency
Air Resources Board

Vapor Recovery Test Procedure

TP-204.2

Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks

1 APPLICABILITY

Definitions common to all certification and test procedures are in:

D-200 Definitions ~~for Certification Procedures and Test Procedures~~ for Vapor Recovery Procedures~~Systems~~

For the purpose of this procedure, the term "ARB" or "CARB" refers to the ~~State of~~California Air Resources Board, and the term "~~ARB~~Executive Officer" refers to the Executive Officer of the ARB or his or her authorized representative or ~~designate~~designee.

1.1 General Applicability

This procedure is used to determine compliance with ~~applies to the determination of~~ the ~~one minute~~daily static pressure performance standard or one minute standard referenced in Certification Procedure 204 (CP-204), Certification Procedure for Vapor Recovery Systems of Cargo Tanks. ~~of a vapor recovery system of a cargo tank by fluid mechanical principles.~~ This procedure may be used to determine ~~applies to any vapor emissions~~daily static pressure associated with the dispensing of any fluid, although it is written to reflect application to the hydrocarbon vapors associated with the dispensing of gasoline.

~~1.2 Determinations of Compliance and Violation~~

~~Determinations of certain modes of compliance with and violation of certification specifications is outlined in § 9.~~

~~1.3 Modifications~~

~~Modification of this procedure may be necessary for vapors and fluids other than the hydrocarbon vapors associated with the dispensing of gasoline.~~

~~Any modification of this method shall be subject to approval by the ARB Executive Officer.~~

2 PRINCIPLE AND SUMMARY OF TEST PROCEDURE

Upon completion of loading operations at the bulk plant ~~gasoline distribution facility~~ or terminal, the gasoline cargo tank is pressurized~~,~~ with nitrogen~~,~~ to 18 inches water column (WC). By using the total cargo tank shell capacity, post-loading headspace volume, and the ideal gas law, a one-minute maximum allowable pressure decay is calculated. The pressure decay is monitored for one minute and compliance is determined by comparison with the maximum allowable calculated value. The leak rate through the cargo tank internal vapor vent valve is similarly determined.

3 BIASES AND INTERFERENCES

Thermal expansion due to direct sunlight on an exposed cargo tank can bias the results of this test procedure. Keep at least 75% of the length of the vapor space of a cargo tank in the shade during testing.

Cargo tank leakage exceeding the nitrogen feed rate precludes the use of this method. Such leakage demonstrates the inability of the cargo tank to meet its performance standard. The minimum nitrogen flowrate shall be calculated as shown in § ~~12~~9.2, or obtained from Table 5.

Pressure stability may not be achievable, within a reasonable time period, if the tank has been purged with air prior to loading gasoline. This tends to bias this test procedure toward determination of compliance. In such a case, the cargo tank shall be moved to disturb the liquid and saturate the vapor space.

Vapor leaks due to a faulty cargo tank vapor coupler or facility vapor hose coupler inherently shall constitute the violation of the one minute ~~performance~~ standard for any tank subject to this test procedure.

If the load prior to testing is diesel over gasoline, this tends to bias this test procedure toward determination of non-compliance. In such a case, the following steps shall be taken to eliminate this bias:

(1) The pressure decay portion of the test shall be conducted three times to compensate for the absorption of gasoline vapors into the diesel. For the purpose of this interference, diesel shall be defined as any petroleum distillate with a vapor pressure under 4.0 pounds Reid.

(2) The first two tests will promote absorption of the gasoline vapors into the diesel to eliminate this bias.

4 SENSITIVITY, RANGE, AND PRECISION

4.1 Mechanical Pressure Gauges

Mechanical gauges shall be a minimum of two inches in diameter.

The readability of a mechanical pressure gauge shall be:

0.20 inches WC ~~water column~~ on a full scale not to exceed thirty (30) inches WC~~water column~~ for cargo tank tests and

0.10 inches WC~~water column~~ on a full scale not to exceed ten (10) inches WC ~~water~~

~~column~~ for internal vapor valve tests.

The accuracy of a mechanical pressure gauge shall be one (1.0) percent of full scale.

4.2 Other Pressure Gauges

The full scale range of other pressure gauges shall not exceed twenty (20) inches WC ~~water column~~ for cargo tank tests and for internal vapor valve tests.

The accuracy of other pressure gauges shall be ~~one-half of one~~ 0.5 percent of full scale for cargo tank tests and for internal vapor valve tests.

5 EQUIPMENT

5.1 Nitrogen High Pressure Cylinder

Use a high pressure cylinder capable of maintaining a pressure of 2000 pounds per square inch gauge (psig). The cylinder shall be equipped with a compatible two-stage regulator with a one (1) psig relief valve and a flow control metering valve. The outlet of the metering valve shall be equipped with flexible tubing, a quick-connect fitting, and a one psi relief valve.

5.2 Vapor System Pressure Assembly

Use an OPW 634-B, or equivalent, cap (or OPW 634-A plug if applicable). The assembly shall be equipped with a 0-30 inch WC~~water column~~ pressure gauge, a metering valve, and a quick connect fitting (see Figure 1).

5.3 Vapor Valve Pressure Gauge

Use a pressure measuring device ~~(transducer, inclined manometer, or Magnahelic gauge)~~with a design range suitable for the pressure being measured. The tap for the pressure measurement shall be located on the sample coupling attached to the inlet of the volume meter.

~~Use a Dwyer Model 2010 Magnahelic gauge (0-10 inches water column), or equivalent, equipped with a quick connect fitting.~~

5.4 Leak Test Assembly

Use OPW 633-D, 633-F, and 633-A (or 633-B if applicable) couplers, or equivalent as shown in Figure 2 ~~(attached)~~ to leak test the vapor system pressure assembly.

5.5 Flexible Tubing

Use high-pressure tubing equipped with a quick-connect fitting at each end to connect the nitrogen supply to the pressure assembly.

5.6 Nitrogen

Use a commercial grade nitrogen.

5.7 Stopwatch

Use a stopwatch accurate and precise to within 0.2 second.

5.8 Liquid Leak Detector

Use ~~Snoop liquid~~ leak detection solution ~~detector,~~ or equivalent to detect ~~gas~~vapor leaks in the vapor system pressure assembly.

5.9 Combustible Gas Detector

Use a Bacharach Instrument Company Model 0023-7356, or equivalent, to quantify any vapor leaks at the cargo tank vapor coupler during loading operations.

~~6 CALIBRATION PROCEDURE~~

~~This section is reserved for future specification.~~

6~~7~~ PRE-TEST PROTOCOL

The cargo tank shall adhere to all ~~of the other~~applicable certification conditions referenced in CP-204~~(in addition to those requirements of CP-204 to which this test procedure applies)~~.

6~~7~~.1 Leak Check of Test Equipment

Assemble the vapor system pressure assembly as shown in Figure 1~~(attached)~~.

Leak test the vapor system pressure assembly by connecting it to the leak test assembly and pressurizing, with nitrogen, to 20 inches WC~~water column~~. The decay rate shall not exceed 2 inches WC in five minutes.

6~~7~~.2 Cargo Tank Location

Locate any cargo tank to be tested where at least 75% of its length will be in shade for the duration of the test.

6~~7~~.3 Cargo Tank Preparation

6~~7~~.3.1 In general, this test procedure shall be performed on cargo tanks in conditions of routine operation, maintenance, and repair. Other conditions shall be documented in the test report.

6~~7~~.3.2 If performance of this test procedure is required due to demonstrated non-compliance with the leak performance standards, the test report shall document compliance with the following conditions:

6~~7~~.3.2.1 No repairs or maintenance of the cargo tank shall be allowed from the time of such demonstration until after the performance of this test procedure.

6~~7~~.3.2.2 Any movement or disturbance of the cargo tank or its contents shall be kept to a reasonable and practical minimum. For example:

(1) The cargo tank may be moved for business reasons if it occupies a position needed by another cargo tank.
(2) The cargo tank may be moved to meet the environmental requirements for cargo tank location.
(3) The cargo tank shall be moved to saturate the vapor space before testing if it was purged with air before gasoline loading.

7~~8~~ TEST PROCEDURE

For those cargo tanks with ~~manifolded~~ product lines that are manifolded, this test procedure ~~must~~shall be conducted on a per compartment basis.

7~~8~~.1 Initial Data Collection and Pressurization

7~~8~~.1.1 From ~~the cargo tank calibration sheet or~~ the identification plate on the cargo tank, determine and record the cargo tank shell capacity ~~on Line 1 of the data sheet shown in Figure 3 (attached). Record, in the upper right hand corner of the data sheet, whether the cargo tank's vapor coupler is equipped with a poppet and/or cap~~.

7~~8~~.1.2 Upon completion of the loading operations, record the total volume loaded ~~on Line 2 of the data sheet (Figure 3~~.

7~~8~~.1.3 If the system back pressure during loading was measured, enter the maximum observed pressure and number of arms loading ~~simultaneously on Line 4 of the data sheet (Figure 3)~~.

7~~8~~.1.4 If required by the safety procedures of the loading facility, ensure that a ground cable is connected to the cargo tank. If the cargo tank is remote from the loading rack so that the ground cable is not attached to the loading rack, then attach the ground cable to the nitrogen supply bottle. Connect the vapor system pressure assembly to the vapor coupler of the cargo tank. Open the internal vapor valve(s) of the cargo tank and record the initial headspace. ~~pressure on Line 5 of the data sheet (Figure 3).~~

7~~8~~.1.5 If the initial headspace pressure exceeds 18 inches water column, use the metering valve on the vapor system pressure assembly to reduce the pressure to 18.0 inches WC ~~water column~~.

7~~8~~.1.6 If the initial headspace pressure is less than 18 inches WC~~water column~~, adjust the delivery pressure on the nitrogen cylinder regulator such that the nitrogen feed rate exceeds the minimum allowable flow rate for an empty cargo tank. See equation in § ~~12~~9.2, or Table 5. Connect the nitrogen supply to the pressure assembly and increase the cargo tank headspace pressure to 18 inches WC~~water column~~.

7~~8~~.1.7 For the next 30 ± 5 seconds, carefully adjust the headspace pressure to 18.0 inches WC~~water column~~.

7~~8~~.2 Static Pressure Performance Measurement

7~~8~~.2.1 Zero and re-start the stopwatch with the headspace pressure at 18.0 inches WC~~water column~~. After 60 ± 5 seconds record the headspace pressure as the "one-minute final pressure" ~~on Line 7 of the data sheet (Figure 3)~~.

7~~8~~.2.2 If the one-minute final pressure is less than 10 inches water column, the internal vapor valve portion of the test, as specified next, cannot be conducted.

7~~8~~.3 Re-pressurization

7~~8~~.3.1 Re-pressurize the cargo tank headspace to 18 inches WC~~water column~~. Close the internal vapor vent valve(s), wait for 30 ± 5 seconds, then, remove the pressure assembly cap to relieve the pressure, to atmospheric, downstream of the vapor vent valve. Wait for 15 ± 5 seconds. Replace the pressure assembly cap.

7~~8~~.3.2 Connect the 0-10 inches WC~~water column~~ pressure gauge to the quick connect fitting on the vapor system pressure assembly.

7~~8~~.4 Internal Vapor Valve Performance Measurement

7~~8~~.4.1 Interval Headspace Pressures

Zero and start the stopwatch as the pressure assembly cap is replaced. Repeat the following steps for up to five continuous intervals (each interval = 60 ± 5 seconds):

(1) record the total headspace pressure increase as the "interval pressure" ~~(on Lines 11 through 15 of the data sheet (Figure 3)~~ in sequence, depending on the next step~~)~~; and

(2) if the total headspace pressure increase is equal to or less than the corresponding allowable value specified in section 3.2.2 of CP-204, proceed to measure the "final pressure" as specified below; otherwise return to step (1)~~ above~~.

7~~8~~.4.2 Final Headspace Pressure

Within five seconds of the end of the last continuous interval above, open the vapor valve and record the headspace pressure as the "final pressure."~~ on Line 16 of the data sheet (Figure 3).~~

Remove the vapor system pressure assembly from the cargo tank.

8.0 REQUIREMENTS AT THE CONCLUSION OF PRESSURE TESTING

At the conclusion of pressure testing, the cargo tank owner or operator shall inspect the entire cargo tank and compartments, including tank, domes, dome vents, piping hose connections, adaptors, couplings, hoses and delivery elbows for evidence of wear, damage, or maladjustment that may be a potential leak source. Any part found to be defective shall be adjusted, repaired or replaced as necessary.

~~9 DETERMINATIONS OF COMPLIANCE AND VIOLATION~~

~~Determinations of certain modes of compliance with and violation of certification specifications are outlined below.~~

~~9.1 Static Pressure Performance Standard~~

~~9.1.1 Determination of Static Pressure Performance Standard~~

~~Determine the appropriate static pressure performance standard using § 1211.1 or Tables 1 through 4 (attached) and information from the data sheet (Figure 3).~~

~~9.1.2 Determination of Compliance~~

~~Compliance is determined if the one-minute final pressure on Line 7 of the data sheet (Figure 3) is equal to or greater than the appropriate static pressure performance standard.~~

~~9.1.3 Determination of Violation~~

~~Violation is determined if the one-minute final pressure on Line 7 of the data sheet (Figure 3) is less than the appropriate static pressure performance standard.~~

~~9.2 Internal Vapor Valve Performance Standard~~

~~9.2.1 Determination of Compliance~~

~~Compliance is determined if:~~

~~(1) the one-minute final pressure on Line 7 of the data sheet (Figure 3) was less than 10 inches water column; or~~

~~(2) a) any interval pressure across the internal vapor valve(s) on Lines 11-15 of the data sheet (Figure 3) is equal to or less than any of the five performance standards, as shown on the data sheet and in § 1211.3; and~~

~~b) the final pressure on Line 16 of the data sheet is equal to or greater than one-fifth (20%) of the one-minute final headspace pressure on Line 7 of the data sheet (Figure 3).~~

~~9.2.2 Determination of Violation~~

~~Violation is determined if:~~

~~(1) the one-minute final pressure on Line 7 of the data sheet (Figure 3) was equal to or greater than 10 inches water column; and~~

~~(2) a) no interval pressure across the internal vapor valve(s) on Lines 11-15 of~~

~~the data sheet (Figure 3) is equal to or less than any of the five performance standards, as shown on the data sheet and in § 1211.3; or~~

~~b) the final pressure on Line 16 of the data sheet is less than one-fifth (20%) of the one-minute final headspace pressure on Line 7 of the data sheet (Figure 3).~~

~~10 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)~~

~~This section is reserved for future specification.~~

~~11 RECORDING DATA~~

~~The data shall be recorded as shown in Figure~~

9~~12~~ CALCULATING RESULTS

9~~12~~.1 One Minute Static Pressure Performance Standard

The minimum allowable one-minute final headspace pressure of a complying loaded cargo tank shall be obtained from the application of Tables 1 through 4, or shall be calculated as follows:

$$P_F = 18\left(\frac{N}{18}\right)^{\left(\frac{V_s}{5V_h}\right)}$$

Where:

P_F	=	minimum allowable one-minute final pressure, inches water column
V_s	=	total cargo tank shell capacity, gallons
V_h	=	cargo tank headspace volume after loading, gallons
18	=	initial pressure at start of test, inches water column
N	=	five minute performance standard, inches water column

Where:

If (Vs) is:			Then (N) equals:
≥		2,500	15.5
1,500	to	2,499	15.0
1,000	to	1,499	14.5
0	to	999	14.0

Important: If individual compartments are to be tested, both V_s and V_h must be the volumes relating to that compartment alone, not all compartments.

Note: Tables 1 through 45 are convenient results of the calculation described above.

In these tables, the columns are headed by values of V_h and the rows are preceded by values of V_s.

Obtain the calculated result for P_F by finding the value of P_F at the intersection of the appropriate column and row for V_h and V_s.

9~~12~~.2 Minimum Nitrogen Flowrate

The minimum nitrogen flowrate required to test a cargo tank shall exceed the following calculated value by at least ten percent, or obtained from Table ~~5~~6:

$$Fn = \frac{V_s\,(18.0 - N)}{(7.481 \times 5 \times 406.9)}$$

Where:

Fn	=	minimum required nitrogen flowrate, CFM
Vs	=	total cargo tank shell capacity, gallons
18	=	initial pressure at start of test, inches water column
N	=	five minute performance standard, inches water column
5	=	5 minutes
406.9	=	atmospheric pressure, inches water column
7.481	=	number of gallons per cubic foot

9~~12~~.3 Internal Vapor Valve Performance Standard

The internal vapor valve performance standard is found in section 3.2.2 of CP-204. ~~compliance status of the cargo tank internal vapor vent valve(s) shall be determined as follows:~~

~~Test Time, Minutes~~	~~Maximum Allowable One-Minute Pressure Increase, inches H_2O~~
~~1.0~~	~~1.1~~
~~2.0~~	~~2.2~~
~~3.0~~	~~3.3~~
~~4.0~~	~~4.4~~
~~5.0~~	~~5.5~~

~~The values in the right hand column are adjusted upward to account for a systematic bias caused by expansion in the headspace of the cargo tank subsequent to thermal conduction from the shell. The value of 5.5 at the bottom of the column corresponds equivalently to the 5.0 inches H_2O pressure increase allowed by the five minute performance standard.~~

9~~12~~.4 Conversion from One Minute to Five Minute Pressure

The conversion of the one-minute final pressure to the equivalent five-minute final pressure of an empty cargo tank shall be calculated as follows:

$$P_{f5} = 18\,e^{-\left[5\left(\frac{V_h}{V_s}\right)\ln\left(\frac{18}{P_{f1}}\right)\right]}$$

Where:

Pf	=	equivalent five-minute final pressure for an empty cargo tank, ~~CFM~~ inches water column
V_s	=	total cargo tank shell capacity, gallons
V_h	=	cargo tank headspace volume after loading, gallons
P_{f1}	=	one-minute final pressure from Line 7 of the data sheet (Figure 3), inches water column
18	=	initial pressure at start of test, inches water column
5	=	5 minutes
ln	=	natural logarithm
e	=	constant equal to 2.71828

~~13 REPORTING RESULTS~~

~~The results shall be reported as shown in Figure 3.~~

10~~14~~ ALTERNATE~~IVE TEST~~ PROCEDURES

This test procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the Executive Officer, pursuant to section 5 of Certification Procedure 204 (CP-204).~~Test procedures, other than specified above, shall only be used if prior written approval is obtained from the ARB Executive Officer. In order to secure the ARB Executive Officer's approval of an alternative test procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative test procedure is equivalent to this test procedure.~~

~~(1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.~~

~~(2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB Executive Officer's files and shall be made available upon request.~~

~~1513 REFERENCES~~

~~This section is reserved for future specification.~~

11~~16~~ EXAMPLE FIGURES, ~~FORMS,~~ AND TABLES

Each figure ~~, form,~~ or table provides an illustration of an implementation which conforms to the requirements of this test procedure; other implementations which so conform are acceptable, too. Any specifications or dimensions provided in the figures~~, forms,~~ or tables are for example only, unless such specifications or dimensions are provided as requirements in the text of this or some other required test procedure.

Figure 1
Vapor System Pressure Assembly

Figure 2
Leak Test Assembly

~~**Figure 3**~~
~~**Data Form**~~

Table 1
One-Minute Static Performance Standard (4,000 to 9,900 gallons ullage)

Table 2
One-Minute Static Performance Standard (2,500 to 3,999 gallons ullage)

Table ~~2~~3
One-Minute Static Performance Standard (1,500 to 2,499 gallons ullage)

Table ~~3~~4
One-Minute Static Performance Standard (1,000 to 1,499 gallons ullage)

Table 45
One-Minute Static Performance Standard (300 to 999 gallons ullage)

Table ~~5~~6
Minimum Nitrogen Feed Rate

FIGURE 1

Vapor System Pressure Assembly

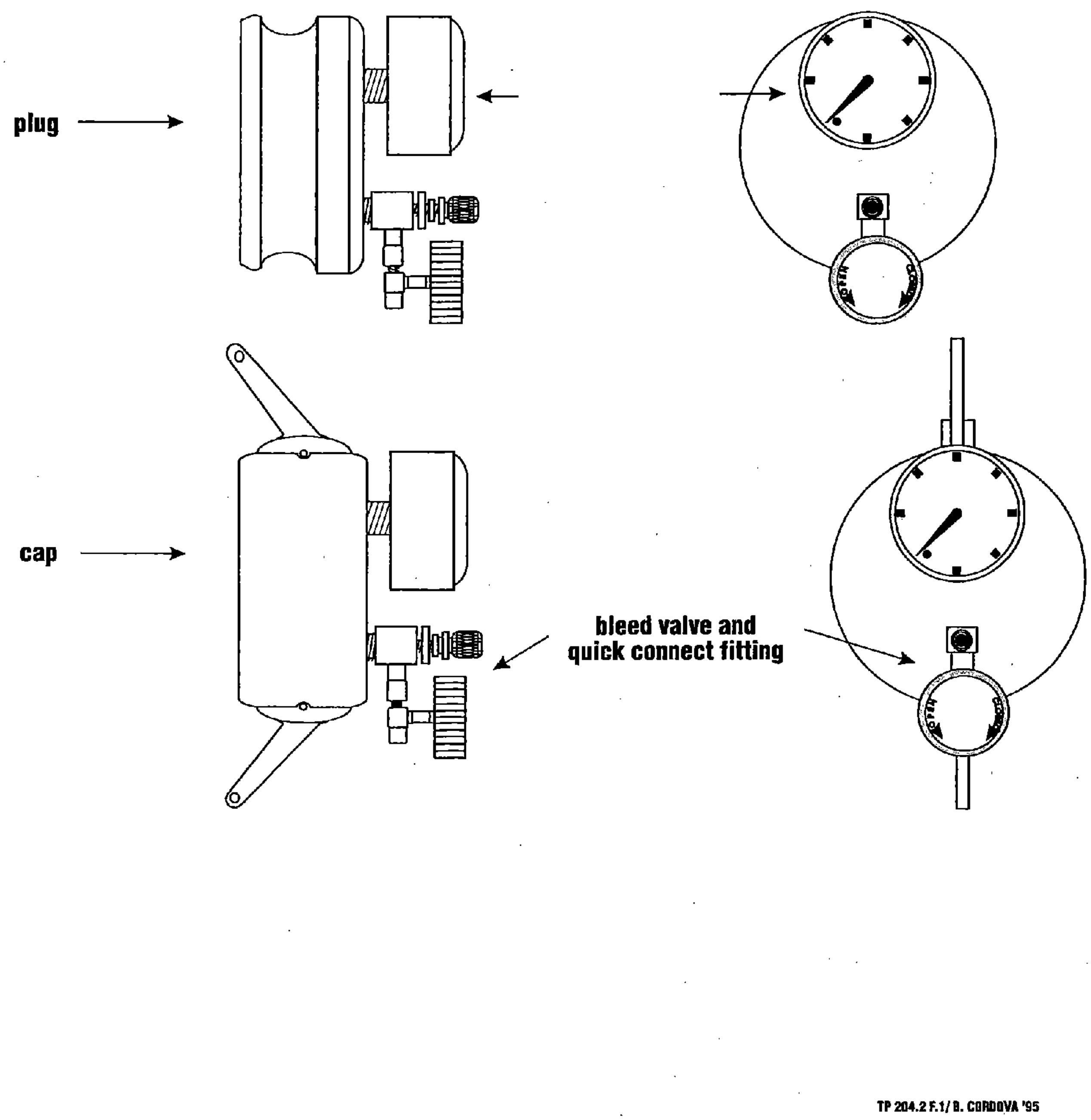
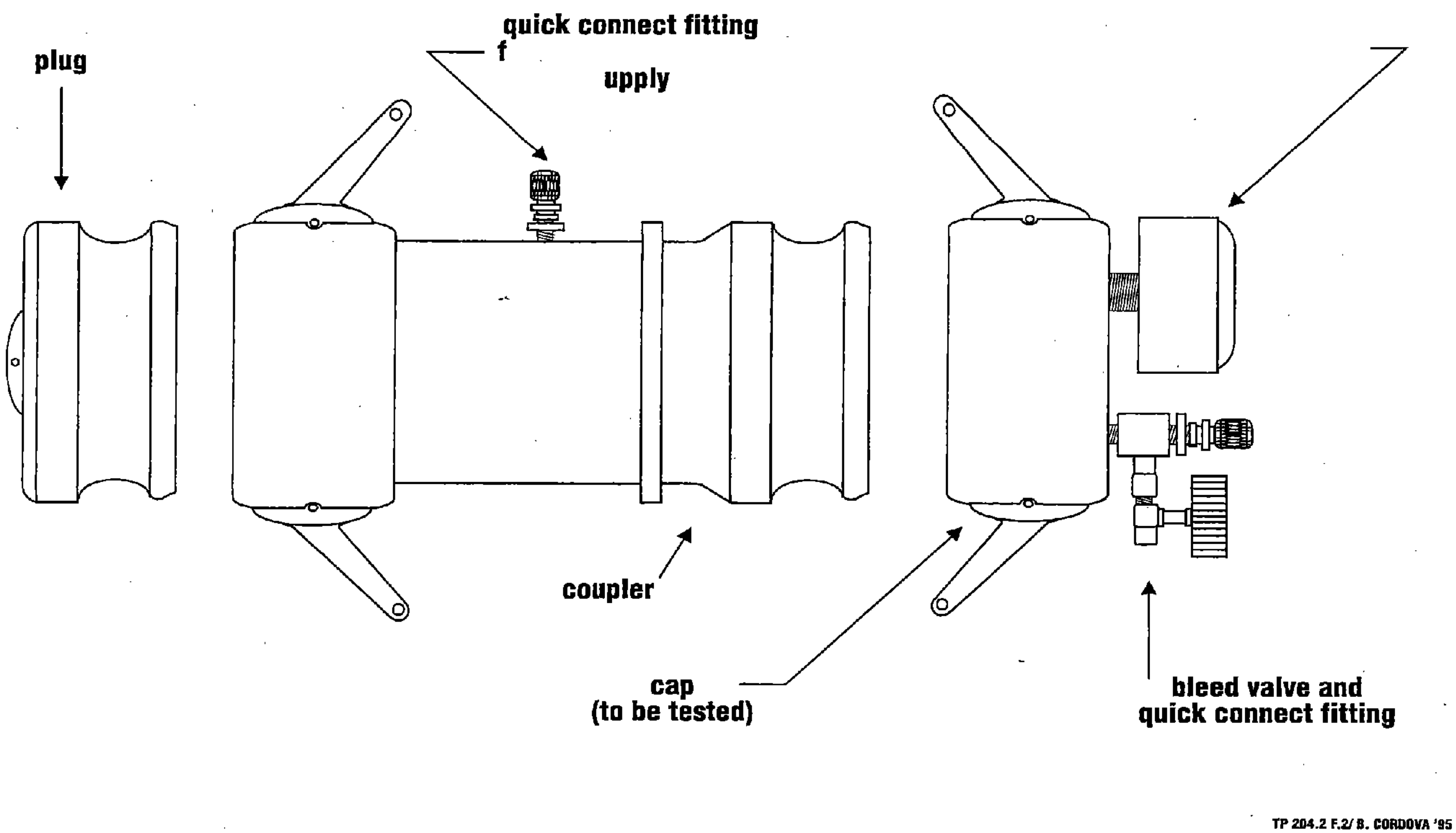


FIGURE 2
Leak Test Assembly



~~FIGURE 3~~

~~Data Sheet~~

~~Company: Pit # or N #:~~	~~POPPETS - TRUCK~~
~~Address: City: Zip:~~	~~POPPETS - TRAILER~~
~~Driver: Tel. No. ( )~~	~~VAPOR CAP - TRUCK~~
~~Terminal: Pit #:~~	~~VAPOR CAP - TRAILER~~

~~Attention:~~

~~CARGO TANK TEST PROCEDURE~~

~~TP-204.2~~

	~~TRUCK~~	~~TRAILER~~
~~CT #~~		
~~ARB DECAL #~~		
~~EXP. DATE~~		
~~INITIAL DATA~~		
~~1) CARGO TANK CAPACITY, GALLONS~~		
~~2) TOTAL VOLUME LOADED INTO CARGO TANK, GALLONS~~		
~~3) HEADSPACE VOLUME AFTER LOADING (#1-#2), GALLONS~~		
~~4) SYSTEM BACK PRESSURE, IN. H_2O~~		
~~STATIC PRESSURE PERFORMANCE~~		
~~5) INITIAL PRESSURE BEFORE NITROGEN FEED, IN. H_2O~~		
~~6) INITIAL PRESSURE FOR LEAK RATE (18.0), IN. H_2O~~	~~18.0~~	~~18.0~~
~~7) ONE-MINUTE FINAL PRESSURE, IN. H_2O~~		
~~8) ALLOWABLE ONE-MINUTE FINAL PRESSURE, IN. H_2O~~		
~~9) COMPARABLE 5-MINUTE PRESSURE CHANGE, IN. H_2O~~		
~~INTERNAL VAPOR VALVE PERFORMANCE~~		
~~10) INITIAL PRESSURE (0.0), IN. H_2O~~	~~0.0~~	~~0.0~~
~~11) INTERVAL PRESSURE AFTER (1) MINUTE, IN. H_2O - ALLOWABLE = 1.1 IN. H_2O~~		
~~12) INTERVAL PRESSURE AFTER (2) MINUTES, IN. H_2O - ALLOWABLE = 2.2 IN. H_2O~~		
~~13) INTERVAL PRESSURE AFTER (3) MINUTES, IN. H_2O - ALLOWABLE = 3.3 IN. H_2O~~		
~~14) INTERVAL PRESSURE AFTER (4) MINUTES, IN. H_2O - ALLOWABLE = 4.4 IN. H_2O~~		
~~15) INTERVAL PRESSURE AFTER (5) MINUTES, IN. H_2O - ALLOWABLE = 5.5 IN. H_2O~~		
~~16) FINAL PRESSURE AFTER LAST INTERVAL AND VALVE OPENING~~		

~~TRUCK: Comp't.~~	~~#1~~	~~TRAILER: Comp't.~~	~~#1~~
	~~#2~~		~~#2~~
	~~#3~~		~~#3~~
	~~#4~~		~~#4~~
~~TOTAL~~		~~TOTAL~~	
~~LOAD TYPE~~		~~LOAD TYPE~~	

~~COMMENTS:~~

Table 1
One-Minute Static Performance Standard
(4,000 to 9,900 gallons ullage)
(See § 9~~12~~.1)

	100	150	200	250	300	350	400	450	500	550	600	650	700
	----	----	----	----	----	----	----	----	----	----	----	----	----
4,000	**5.4**	**8.1**	**9.9**	**11.2**	**12.1**	**12.8**	**13.3**	**13.8**	**14.2**	**14.5**	**14.7**	**15.0**	**15.2**
4,100	5.3	7.9	9.8	11.0	12.0	12.7	13.2	13.7	14.1	14.4	14.7	14.9	15.1
4,200	**5.1**	**7.8**	**9.6**	**10.9**	**11.8**	**12.6**	**13.1**	**13.6**	**14.0**	**14.3**	**14.6**	**14.8**	**15.0**
4,300	5.0	7.6	9.5	10.8	11.7	12.5	13.1	13.5	13.9	14.2	14.5	14.8	15.0
4,400	**4.8**	**7.5**	**9.3**	**10.6**	**11.6**	**12.4**	**13.0**	**13.4**	**13.8**	**14.2**	**14.5**	**14.7**	**14.9**
4,500	4.7	7.3	9.2	10.5	11.5	12.3	12.9	13.3	13.8	14.1	14.4	14.6	14.9
4,600	**4.5**	**7.2**	**9.0**	**10.4**	**11.4**	**12.1**	**12.8**	**13.3**	**13.7**	**14.0**	**14.3**	**14.6**	**14.8**
4,700	4.4	7.1	8.9	10.3	11.3	12.0	12.7	13.2	13.6	13.9	14.2	14.5	14.7
4,800	**4.3**	**6.9**	**8.8**	**10.1**	**11.2**	**11.9**	**12.6**	**13.1**	**13.5**	**13.9**	**14.2**	**14.4**	**14.6**
4,900	4.2	6.8	8.7	10.0	11.0	11.8	12.5	13.0	13.4	13.8	14.1	14.4	14.6
5,000	**4.0**	**6.6**	**8.5**	**9.9**	**10.9**	**11.7**	**12.4**	**12.9**	**13.3**	**13.7**	**14.0**	**14.3**	**14.5**
5,100	3.9	6.5	8.4	9.8	10.8	11.6	12.3	12.8	13.3	13.6	14.0	14.2	14.5
5,200	**3.8**	**6.4**	**8.3**	**9.7**	**10.7**	**11.5**	**12.2**	**12.7**	**13.2**	**13.6**	**13.9**	**14.2**	**14.4**
5,300	3.7	6.3	8.1	9.5	10.6	11.4	12.1	12.7	13.1	13.5	13.8	14.1	14.4
5,400	**3.6**	**6.1**	**8.0**	**9.4**	**10.5**	**11.3**	**12.0**	**12.6**	**13.0**	**13.4**	**13.8**	**14.0**	**14.3**
5,500	3.5	6.0	7.9	9.3	10.4	11.3	11.9	12.5	13.0	13.3	13.7	14.0	14.2
5,600	**3.4**	**5.9**	**7.8**	**9.2**	**10.3**	**11.2**	**11.8**	**12.4**	**12.9**	**13.3**	**13.6**	**13.9**	**14.2**
5,700	3.3	5.8	7.7	9.1	10.2	11.1	11.8	12.3	12.8	13.2	13.5	13.8	14.1

	300	350	400	450	500	550	600	650	700	750	800	850	900
	----	----	----	----	----	----	----	----	----	----	----	----	----
9,200	**7.2**	**8.2**	**9.0**	**9.8**	**10.4**	**10.9**	**11.4**	**11.8**	**12.1**	**12.5**	**12.8**	**13.0**	**13.3**
9,300	7.1	8.1	8.9	9.6	10.3	10.9	11.3	11.7	12.1	12.4	12.7	13.0	13.2
9,400	**7.1**	**8.1**	**8.9**	**9.6**	**10.3**	**10.8**	**11.3**	**11.7**	**12.0**	**12.4**	**12.7**	**12.9**	**13.2**
9,500	7.0	8.0	8.8	9.6	10.2	10.7	11.2	11.6	12.0	12.3	12.6	12.9	13.1
9,600	**6.9**	**7.9**	**8.8**	**9.5**	**10.1**	**10.7**	**11.2**	**11.2**	**11.9**	**12.3**	**12.6**	**12.8**	**13.1**
9,700	6.8	7.9	8.7	9.4	10.1	10.6	11.1	11.5	11.9	12.2	12.5	12.8	13.0
9,800	**6.8**	**7.8**	**8.7**	**9.4**	**10.0**	**10.6**	**11.0**	**11.5**	**11.8**	**12.2**	**12.5**	**12.8**	**13.0**
9,900	6.7	7.7	8.6	9.3	10.0	10.5	11.0	11.4	11.8	12.1	12.4	12.7	12.9

Table 2
One-Minute Static Performance Standard
(2,500 to 3,999 gallons ullage)
(See § 9.1)

	100	150	200	250	300	350	400	450	500	550	600	650	700
	----	----	----	----	----	----	----	----	----	----	----	----	----
2500	**8.5**	**10.9**	**12.4**	**13.3**	**14.0**	**14.5**	**14.9**	**15.2**	**15.5**	**15.7**	**15.9**	**16.0**	**16.2**
2600	8.3	10.7	12.2	13.2	13.9	14.4	14.8	15.1	15.4	15.6	15.8	16.0	16.1
2700	**8.0**	**10.5**	**12.0**	**13.0**	**13.8**	**14.3**	**14.7**	**15.0**	**15.3**	**15.5**	**15.7**	**15.9**	**16.0**
2800	7.8	10.3	11.8	12.9	13.6	14.2	14.6	14.9	15.2	15.5	15.7	15.8	16.0
2900	**7.6**	**10.1**	**11.7**	**12.7**	**13.5**	**14.0**	**14.5**	**14.8**	**15.1**	**15.4**	**15.6**	**15.8**	**15.9**
3000	7.3	9.9	11.5	12.6	13.3	13.9	14.4	14.7	15.0	15.3	15.5	15.7	15.8
3100	**7.1**	**9.7**	**11.3**	**12.4**	**13.2**	**13.8**	**14.3**	**14.6**	**15.0**	**15.2**	**15.4**	**15.6**	**15.8**
3200	6.9	9.5	11.2	12.1	13.1	13.7	14.2	14.6	14.9	15.1	15.3	15.5	15.7
3300	**6.7**	**9.3**	**11.0**	**12.1**	**13.0**	**13.6**	**14.1**	**14.5**	**14.8**	**15.0**	**15.2**	**15.5**	**15.6**
3400	6.5	9.1	10.8	12.0	12.8	13.5	14.0	14.4	14.7	15.0	15.2	15.4	15.6
3500	**6.3**	**9.0**	**10.7**	**11.8**	**12.7**	**13.5**	**13.9**	**14.3**	**14.6**	**14.9**	**15.1**	**15.3**	**15.5**
3600	6.1	8.8	10.5	11.7	12.6	13.2	13.8	14.2	14.5	14.8	15.0	15.3	15.4
3700	**6.0**	**8.6**	**10.4**	**11.6**	**12.4**	**13.3**	**13.6**	**14.1**	**14.4**	**14.7**	**15.0**	**15.2**	**15.4**
3800	5.8	8.4	10.2	11.4	12.3	13.0	13.5	14.0	14.3	14.6	14.9	15.1	15.3
3900	**5.6**	**8.3**	**10.0**	**11.3**	**12.2**	**12.9**	**13.4**	**13.9**	**14.3**	**14.6**	**14.8**	**15.0**	**15.2**
3999	**5.4**	**8.1**	**9.9**	**11.2**	**12.1**	**12.8**	**13.3**	**13.8**	**14.2**	**14.5**	**14.7**	**15.0**	**15.2**

TABLE ~~2~~3

One-Minute Static Performance Standard
(1,500 to 2,499 gallons ullage)
(See § 9~~12~~.1)

	50	100	150	200	250	300	350	400	450	500	550	600
	----	----	----	----	----	----	----	----	----	----	----	----
1,500	**6.0**	**10.4**	**12.5**	**13.7**	**14.5**	**15.0**	**15.4**	**15.7**	**15.9**	**16.1**	**16.3**	**16.4**
1,550	5.8	10.2	12.3	13.6	14.4	14.9	15.3	15.6	15.9	16.1	16.2	16.4
1,600	**5.6**	**10.0**	**12.2**	**13.4**	**14.3**	**14.8**	**15.2**	**15.6**	**15.8**	**16.0**	**16.2**	**16.3**
1,650	5.4	9.9	12.1	13.3	14.1	14.7	15.2	15.5	15.7	16.0	16.1	16.3
1,700	**5.2**	**9.7**	**11.9**	**13.2**	**14.0**	**14.6**	**15.1**	**15.4**	**15.7**	**15.9**	**16.1**	**16.2**
1,750	5.0	9.5	11.8	13.1	13.9	14.6	15.0	15.3	15.6	15.8	16.0	16.2
1,800	**4.8**	**9.3**	**11.6**	**13.0**	**13.8**	**14.5**	**14.9**	**15.3**	**15.6**	**15.8**	**16.0**	**16.1**
1,850	4.7	9.2	11.5	12.8	13.7	14.4	14.8	15.2	15.5	15.7	15.9	16.1
1,900	**4.5**	**9.0**	**11.3**	**12.7**	**13.6**	**14.3**	**14.8**	**15.1**	**15.4**	**15.7**	**15.9**	**16.0**
1,950	4.3	8.8	11.2	12.6	13.5	14.2	14.7	15.1	15.4	15.6	15.8	16.0
2,000	**4.2**	**8.7**	**11.1**	**12.5**	**13.4**	**14.1**	**14.6**	**15.0**	**15.3**	**15.6**	**15.8**	**15.9**
2,050	4.0	8.5	10.9	12.4	13.3	14.0	14.5	14.9	15.2	15.5	15.7	15.9
2,100	**3.9**	**8.4**	**10.8**	**12.3**	**13.3**	**13.9**	**14.5**	**14.9**	**15.2**	**15.4**	**15.7**	**15.8**
2,150	3.8	8.2	10.7	12.2	13.2	13.9	14.4	14.8	15.1	15.4	15.6	15.8
2,200	**3.6**	**8.1**	**10.5**	**12.1**	**13.1**	**13.8**	**14.3**	**14.7**	**15.1**	**15.3**	**15.6**	**15.7**
2,250	3.5	7.9	10.4	11.9	13.0	13.7	14.2	14.7	15.0	15.3	15.5	15.7
2,300	**3.4**	**7.8**	**10.3**	**11.8**	**12.9**	**13.6**	**14.2**	**14.6**	**14.9**	**15.2**	**15.5**	**15.7**
2,350	3.2	7.6	10.2	11.7	12.8	13.5	14.1	14.5	14.9	15.2	15.4	15.6
2,400	**3.1**	**7.5**	**10.0**	**11.6**	**12.7**	**13.4**	**14.0**	**14.5**	**14.8**	**15.1**	**15.4**	**15.6**
2,450	3.0	7.4	9.9	11.5	12.6	13.4	13.9	14.4	14.8	15.1	15.3	15.5
2,499	**2.9**	**7.2**	**9.8**	**11.4**	**12.5**	**13.3**	**13.9**	**14.3**	**14.7**	**15.0**	**15.3**	**15.5**

TABLE ~~3~~4

One-Minute Static Performance Standard
(1,000 to 1,499 gallons ullage)
(See § 9~~12~~.1)

	25	50	75	100	125	150	175	200	225	250
1,000	**3.2**	**7.6**	**10.1**	**11.7**	**12.7**	**13.5**	**14.1**	**14.5**	**14.9**	**15.1**
1,050	2.9	7.3	9.8	11.4	12.5	13.3	13.9	14.3	14.7	15.0
1,100	**2.7**	**7.0**	**9.5**	**11.2**	**12.3**	**13.1**	**13.7**	**14.2**	**14.6**	**14.9**
1,150	2.5	6.7	9.3	10.9	12.1	12.9	13.5	14.0	14.4	14.8
1,200	**2.3**	**6.4**	**9.0**	**10.7**	**11.9**	**12.7**	**13.4**	**13.9**	**14.3**	**14.6**
1,250	2.1	6.1	8.8	10.5	11.7	12.6	13.2	13.7	14.2	14.5
1,300	**1.9**	**5.8**	**8.5**	**10.3**	**11.5**	**12.4**	**13.1**	**13.6**	**14.0**	**14.4**
1,350	1.7	5.6	8.3	10.0	11.3	12.2	12.9	13.4	13.9	14.3
1,400	**1.6**	**5.4**	**8.0**	**9.8**	**11.1**	**12.0**	**12.7**	**13.3**	**13.8**	**14.1**
1,450	1.5	5.1	7.8	9.6	10.9	11.8	12.6	13.2	13.6	14.0
1,499	**1.3**	**4.9**	**7.6**	**9.4**	**10.7**	**11.7**	**12.4**	**13.0**	**13.5**	**13.9**

TABLE 45

One-Minute Static Performance Standard
(300 to 999 gallons ullage)

(See § 9~~12~~.1)

	25	50	75	100	125	150	175	200	225	250
300	**9.8**	**13.3**	**14.7**	**15.5**	**16.0**	**16.3**	**16.5**	**16.7**	**16.8**	**17.0**
350	8.9	12.7	14.2	15.1	15.6	16.0	16.3	16.5	16.6	16.8
400	**8.1**	**12.0**	**13.8**	**14.7**	**15.3**	**15.7**	**16.0**	**16.3**	**16.5**	**16.6**
450	7.3	11.4	13.3	14.4	15.0	15.5	15.8	16.1	16.3	16.4
500	**6.6**	**10.9**	**12.9**	**14.0**	**14.7**	**15.2**	**15.6**	**15.9**	**16.1**	**16.3**
550	6.0	10.4	12.5	13.7	14.4	15.0	15.4	15.7	15.9	16.1
600	**5.4**	**9.8**	**12.0**	**13.3**	**14.1**	**14.7**	**15.2**	**15.5**	**15.7**	**16.0**
650	4.9	9.4	11.6	13.0	13.9	14.5	14.9	15.3	15.6	15.8
700	**4.4**	**8.9**	**11.3**	**12.7**	**13.6**	**14.2**	**14.7**	**15.1**	**15.4**	**15.6**
750	4.0	8.5	10.9	12.3	13.3	14.0	14.5	14.9	15.2	15.5
800	**3.6**	**8.1**	**10.5**	**12.0**	**13.0**	**13.8**	**14.3**	**14.7**	**15.1**	**15.3**
850	3.3	7.7	10.2	11.7	12.8	13.5	14.1	14.5	14.9	15.2
900	**2.9**	**7.3**	**9.8**	**11.4**	**12.5**	**13.3**	**13.9**	**14.4**	**14.7**	**15.0**
950	2.7	6.9	9.5	11.2	12.3	13.1	13.7	14.2	14.6	14.9
999	**2.4**	**6.6**	**9.2**	**10.9**	**12.0**	**12.9**	**13.5**	**14.0**	**14.4**	**14.7**

TABLE ~~5~~6

Minimum Nitrogen Feed Rate
(See §9.2)

~~CARGO TANK CAPACITY~~
~~MINIMUM NITROGEN~~

CARGO TANK CAPACITY (GALLONS)	MINIMUM NITROGEN FEED-RATE, CFM
2,500	**0.41**
2,700	0.49
2,900	**0.52**
3,100	0.56
3,300	**0.60**
3,500	0.63
3,700	**0.69**
3,900	0.71
4,100	**0.74**
4,300	0.78
4,500	**0.81**
4,700	0.85
4,900	**0.89**
5,100	0.92
5,300	**0.96**
5,500	0.99
5,700	**1.03**
5,900	1.07
9,000	**1.63**
9,200	1.66
9,400	**1.70**
9,600	1.74
9,800	**1.77**

APPENDIX H

Proposed Amendments to TP-204.3: Determination of Leak(s)

California Environmental Protection Agency

Air Resources Board

PROPOSED

Vapor Recovery Test Procedures

TP-204.3

Determination of Leak(s)

Adopted: April 12, 1996
Amended: March 17, 1999
Amended [insert Amendment Date]

Note: The text is shown in ~~strikeout~~ to indicate that it is proposed for deletion and underline to indicate that it is proposed for addition. [Bracketed text] is not part of the proposed amendments.

California Environmental Protection Agency
Air Resources Board

Vapor Recovery Test Procedure

TP-204.3

Determination of Leak(s)

1 APPLICABILITY

Definitions common to all certification and test procedures are in:

D-200 Definitions for ~~Certification Procedures and Test Procedures for~~ Vapor Recovery Procedures~~Systems~~

For the purpose of this procedure, the term "ARB" or "CARB" refers to the ~~State of~~California Air Resources Board, and the term "~~ARB~~ Executive Officer" refers to the Executive Officer of the ARB or his or her authorized representative or designee ~~delegate~~.

1.1 General Applicability

The procedure is used to determine ~~applies to the determinationof~~the leak-tightness of vapor control systems used in the loading of gasoline cargo tanks. It may be utilized to determine the leak-tightness of gasoline cargo tanks during loading without taking the delivery tank out of service and to determine the leak-tightness of vapor control systems at gasoline terminals and bulk plants at any time. It is also ~~applicable for gasoline cargo tanks during loading operations and is~~ effective to determine leak tightness when ~~only if~~ the vapor control system does not create back-pressure in excess of the pressure limits of the cargo tank certification ~~leak~~ test (18 inches of water column (WC~~gauge~~) referenced in CP-204, Certification Procedure for Vapor Recovery Systems of Cargo Tanks. ~~This procedure does not supersede any district local APCD procedure regarding gasoline loading operations which are more stringent.~~

~~1.2 Determinations of Compliance and Violation~~

~~Determinations of certain modes of compliance with and violation of certification specifications are outlined in § 9.~~

~~1.3 Modifications~~

~~Modification of this procedure may be necessary for vapors and fluids other than the hydrocarbon vapors associated with the dispensing of gasoline.~~

~~Any modification of this method shall be subject to approval by the ARB Executive Officer.~~

2 PRINCIPLE AND SUMMARY OF TEST PROCEDURE

A portable instrument is used to detect VOC leaks from individual sources. A leak definition concentration based on a reference compound is specified in each applicable regulation. This procedure is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rates from individual sources.

~~(See ALTERNATIVE TEST PROCEDURES, EPA Method 21.)~~

~~In principle, this test procedure is intended to be consistent with EPA Method 21.~~

~~While this test procedure provides more detail on some matters than EPA Method 21, nothing in this procedure shall be read, interpreted, or applied in a manner inconsistent with EPA Method 21.~~

3 BIASES AND INTERFERENCES

Individual Vapor Leak Check Duration

The duration ~~results~~ of vapor leak checks will ~~are~~systematically biase~~d~~ the results positively (toward a determination of violation). ~~by leak check duration.~~ To control this bias, leak checks shall be performed individually with a fresh air purge between each leak check. Each leak check shall have a duration of less than twice the instrument response time (typically, less than sixteen seconds). ~~Longer l~~Leak checks with a duration of greater than twice the instrument response time are invalid. The probe must be purged with fresh air for more than two instrument response times (more than sixteen seconds) between individual leak checks.

~~4 SENSITIVITY, RANGE, AND PRECISION~~

~~This section is reserved for future specification.~~

4~~5~~ EQUIPMENT AND SUPPLIES

~~5~~4.1 Manometer

Liquid manometer, or equivalent, capable of measuring up to 7500 pascals (30 inches WC~~H_20~~) gauge pressure with ± 25 pascals (0.1 inch ~~H_20~~WC) precision.

4~~5~~.2 Combustible gas detector

A portable hydrocarbon gas analyzer with associated sampling line and probe using catalytic oxidation to detect and measure concentrations of combustible gas in air.

4~~5~~.2.1 Safety

Personnel shall assume that the combustible gas detector will be operated in an explosive atmosphere and comply with all pertinent regulations.

4~~5~~.2.2 Range

Minimum range of 0-100 percent of the lower explosive limit (LEL) expressed as propane (0 to 21,000 ppm).

4~~5~~.2.3 Probe Diameter

Sampling probe internal diameter of 0.62~~3~~5 cm (1/4 inch).

4~~5~~.2.4 Probe Length

Probe sampling line of sufficient length for easy maneuverability during testing.

4~~5~~.2.5 Response Time

Response time to 90 percent of the final stable reading shall be ~~of~~less than 8 seconds for detector with sampling line and probe attached.

4~~5~~.3 Stopwatch

Accurate and precise to within ±0.2 sec.

4~~5~~.4 Graduated cylinder

Glass or plastic. 1 milliliter (mL) graduations, minimum volume 50 mL.

5~~6~~ CALIBRATION PROCEDURE

Calibration is part of each application of the test procedure, see ~~§~~section 6~~8~~.2.

~~7 PRE-TEST PROTOCOL~~

~~This section is reserved for future specification.~~

6~~8~~ TEST PROCEDURE

6~~8~~.1 Pressure

Place a pressure tap in the terminal or bulk plant vapor control system, as close as reasonably possible to the connection with the cargo tank and before any check valves in the terminal or bulk plant recovery system. Connect the manometer. Record the pressure periodically during testing.

6~~8~~.2 Calibration

Calibrate the combustible gas detector with 2.1 percent by volume (21,000 ppm) propane in air for 100 percent LEL response. Calibration gas shall be traceable to NIST-SRM.

6~~8~~.3 Monitoring Procedure - Vapor Leaks

During loading, check the periphery of all potential sources of leakage of the cargo tank and of the terminal or bulk plant, vapor collection system with a combustible gas detector.

6~~8~~.3.1 Probe Distance

For a mobile leak source (e.g. cargo tank) the detector probe inlet shall be 2.5 cm from the potential leak source. The distance can be maintained during monitoring by putting a 2.5 cm extension on the probe tip.

For a stationary leak source (e.g. loading rack) the probe tip shall be placed at the surface of the suspected leak interface except for a moving part, such as a rotating shaft, for which the probe tip distance shall be 1 cm. The distance can be maintained during monitoring by putting a 1 cm extension on the probe tip.

6~~8~~.3.2 Probe Movement

Move the probe slowly (approximately 4 cm/sec). If there is any meter deflection at a potential leak source, move the probe to locate the point of highest meter response.

6~~8~~.3.3 Probe Position

The probe inlet shall be positioned in the path of the vapor flow from a leak so as to maximize the measured concentration.

6~~8~~.3.4 Wind

Attempt to block the wind from the area being monitored.

6~~8~~.3.5 Detector Response Time

The detector response time must be equal to or less than 8 seconds and the detector shall not probe any potential leak source for longer than twice the detector response time.

6~~8~~.3.6 Recording

Record the highest detector reading and location for each leak being monitored.

6~~8~~.4 Monitoring Procedure - Liquid Leaks

Check cargo tank and bulk plant or terminal system for liquid leaks. Count the number of drops for two minutes.

6~~8~~.4.1 For Liquid Leaks during Disconnect

Capture liquid lost upon disconnect and measure the volume using graduated cylinder.

6~~8~~.4.2 Recording

For liquid leaks, record location and number of drops per minute. For liquid leaks during disconnect, record location (loading arm, recovery arm), cargo tank and volume for each consecutive disconnects.

~~9 DETERMINATIONS OF COMPLIANCE AND VIOLATION~~

~~Determinations of certain modes of compliance with and violation of certification specifications are outlined below.~~

> ~~**Note:** Regarding liquid leaks from cargo tanks, and regarding vapor and liquid leaks from bulk plant and terminal equipment; the compliance status determined by this procedure is the final determination. Regarding vapor leaks from cargo tanks, the final determination of compliance status depends upon the application of all of the applicable requirements of CP-204.~~
>
> ~~The compliance status determined by this procedure shall not supersede any compliance status determination by TP-204.1 or TP-204.2.~~

~~For convenience, the~~The ~~performance standards shall be specified below as they appear in CP-204 § 4.2:~~

~~**Vapor and Liquid Leak Performance Standards**~~

~~The performance standards for leak(s) from any cargo tank is that no liquid leak or~~

~~vapor leak shall occur from any cargo tank according to the following definitions:~~

~~**Note:** A cargo tank shall not be required to comply with any leak criteria or performance standards except those that relate directly to the cargo tank; such leaks are "cargo tank leaks"; examples of leaks which are not cargo tank leaks are:~~ ~~(1) leaks involving bulk plant or terminal equipment including~~ ~~(2) leaks from couplings between cargo tank equipment and bulk plant or terminal equipment, unless the coupling was brought into the bulk plant or terminal facility on the cargo tank vehicle.~~ ~~Leaks of types (1) and (2) are not evidence of non-compliance of the cargo tank per this procedure.~~

~~(1) Vapor Leak~~

~~A vapor leak is defined to be any source of gasoline vapors which causes a combustible gas detector meter reading exceeding 100 percent of the LEL when measured at a distance of one inch (2.5 cm) for a mobile leak source (e.g. cargo tank) or 1 cm for a stationary leak source (e.g. loading rack). A marginal vapor leak may be verified by conducting a pressure/vacuum leak test. A vapor leak does not include any vapor resulting from liquid spillage or leakage.~~

~~(2) Liquid Leak~~

~~A liquid leak is defined to be the dripping of liquid organic compounds at a rate in excess of three (3) drops per minute from any single leak source other than the liquid fill line and vapor line disconnect operations. A liquid leak from liquid fill line and vapor line disconnect operations is defined to be:~~

~~(1) more than two (2) milliliters liquid drainage per disconnect from a top loading operation; or~~

~~(2) more than ten (10) milliliters liquid drainage from a bottom loading operation.~~

~~Such liquid drainage for disconnect operations shall be determined by computing the average drainage from three consecutive disconnects at any one permit unit.~~

~~Other Performance Standards~~

~~Other performance standards may be required at the applicant's request or based on evaluation by the ARB Executive Officer.~~

~~10 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)~~

~~This section is reserved for future specification.~~

~~11 RECORDING DATA~~

~~This section is reserved for future specification.~~

~~12 CALCULATING RESULTS~~

~~This section is reserved for future specification.~~

~~13 REPORTING RESULTS~~

~~This section is reserved for future specification.~~

7~~14~~ ALTERNATE ~~IVE TEST~~ PROCEDURES

7~~14~~.1 U.S. EPA Method 21 - Determination of Volatile Organic Compound Leaks

U.S. EPA Method 21 is an approved alternative procedure as it applies to the performance of this test procedure subject to the provisions of 6.3.1 regarding probe distances.

7~~14~~.2 Other Alternative Test Procedures

This test procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the Executive Officer, pursuant to section 5 of Certification Procedure 204 (CP-204). ~~Test procedures, other than specified above, shall only be used if prior written approval is obtained from the ARB Executive Officer. In order to secure the ARB Executive Officer's approval of an alternative test procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative test procedure is equivalent to this test procedure.~~

~~(1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.~~

~~(2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB Executive Officer's files and shall be made available upon request.~~

~~15 REFERENCES~~

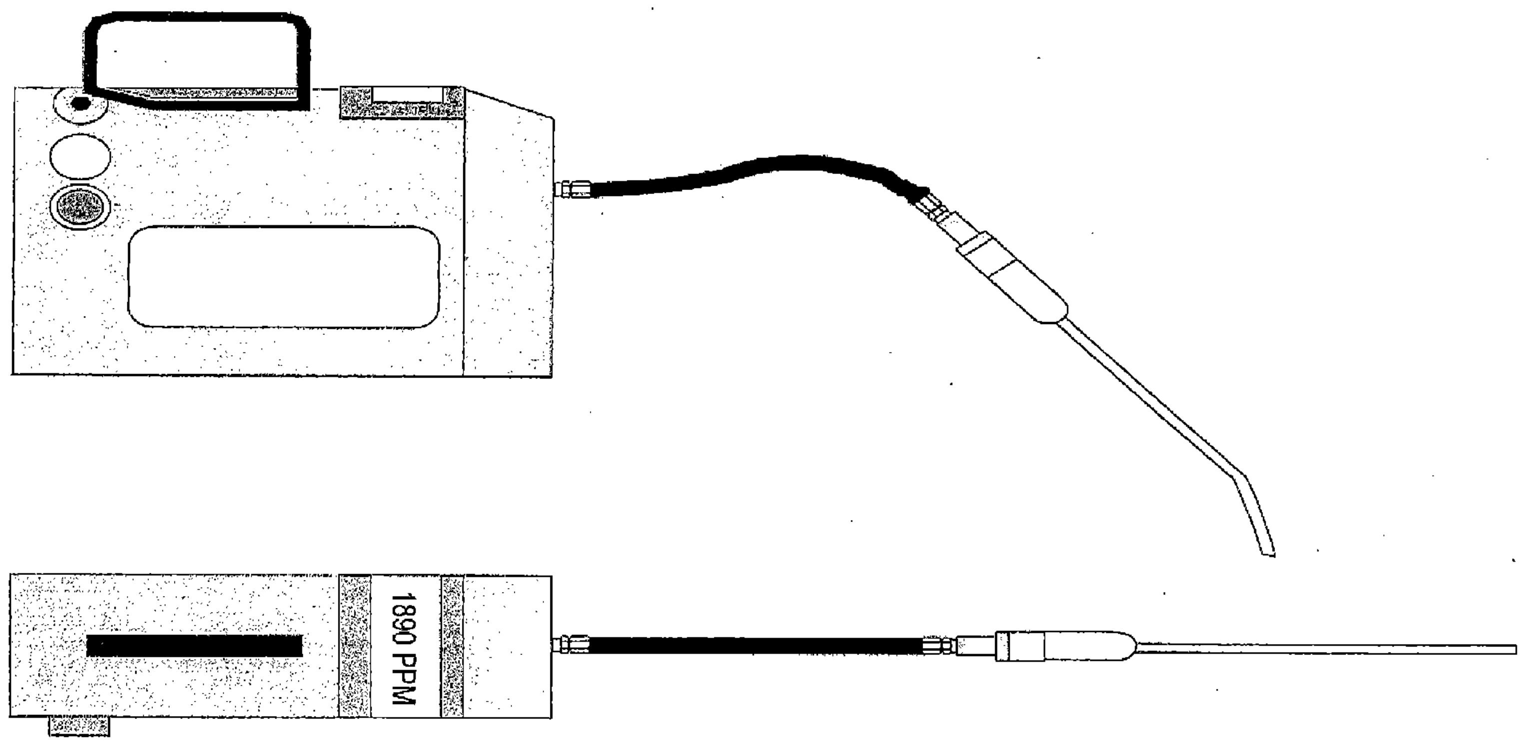
~~This section is reserved for future specification.~~

8~~16~~ FIGURES

Each figure provides an illustration of an implementation which conforms to the requirements of this test procedure; other implementations which so conform are acceptable, too. Any specifications or dimensions provided in the figures are for example only, unless such specifications or dimensions are provided as requirements in the text of this or some other required test procedure.

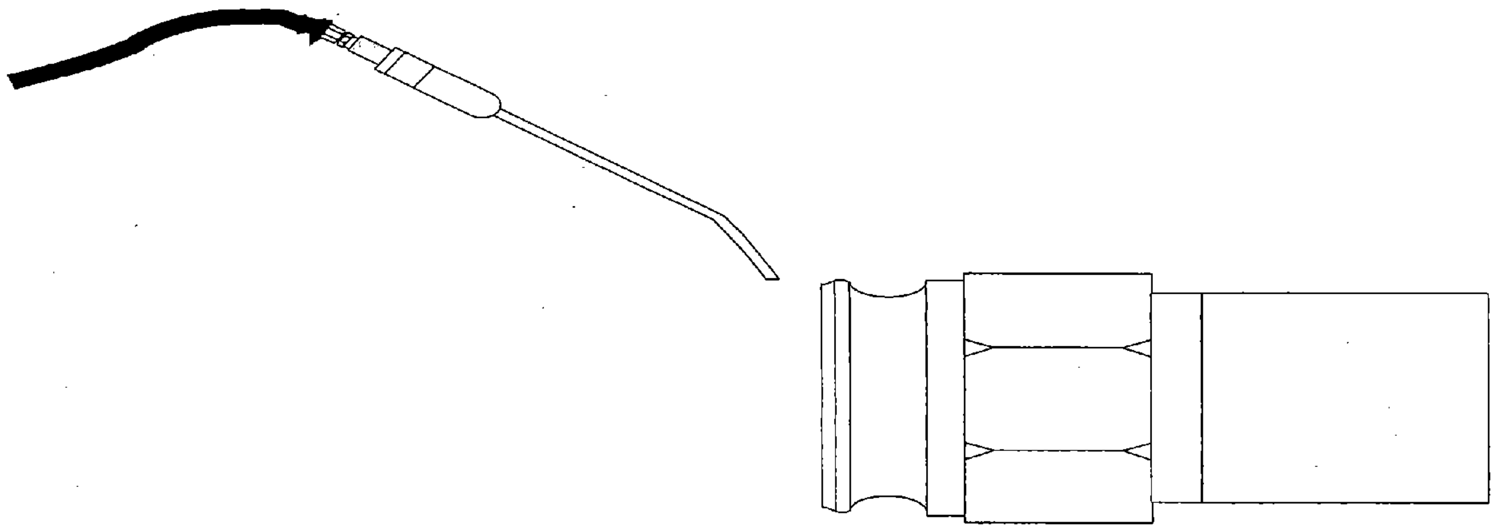
Figures 1 and 2 provide illustrations of a combustible gas meter alone and in use.

FIGURE 1
Phase I Leak Check (View of Combustible Gas Detector)



TP 204.3 F.1/ B. CORDOVA '95

FIGURE 2



TP 204.3 F.2/ B. CORDOVA '95

California Environmental Protection Agency

Air Resources Board

Monitoring and Laboratory Division
Engineering and Certification Branch
Engineering Evaluation Section

Appendix I:

Appropriateness of Test Procedure TP-201.1, *"Volumetric Efficiency for Phase I Systems,"* at Gasoline Dispensing Facilities Equipped with Aboveground Storage Tanks

Date: April 2013

Introduction
ARB is responsible for the evaluation and certification of Phase I Enhanced Vapor Recovery (EVR) systems designed for use with underground (UST) and aboveground (AST) gasoline storage tanks installed at gasoline dispensing facilities. Over the last decade, ARB has certified a total of seven Phase I EVR systems for both UST and AST applications. Until recently, every system evaluated has successfully passed efficiency testing.

On three separate occasions, twice in the summer and once in the winter of 2011, the Morrison Brothers Phase I EVR AST system, designed for single-wall AST applications, failed to achieve the efficiency standard. Failure of this test resulted in direct emissions to the atmosphere. A fourth attempt in February of 2012, resulted in meeting the efficiency standard. The inconsistency of the results indicates a wider problem for future certifications and for in-use applications.

The objective of this document is to provide background information pertaining to ARB's Phase I systems, explain volumetric efficiency testing, to describe results of recent testing, and to recommend a course of action.

Background

Phase I Enhanced Vapor Recovery Systems:
Phase I vapor recovery is generally defined as the collection and containment of vapors during the transfer of gasoline from the cargo tank (or bulk delivery truck) to the storage tank (either AST or UST) located at the gasoline dispensing facility.

Phase I EVR systems, certified by ARB, consist of a series of components which are permanently installed (fixed) onto the tank openings and vent lines. Examples of such components include submerged drop tubes, dry break vapor adaptors, product adaptors, spill container drain valves, pressure vacuum vent valves, couplers, fittings, and automatic tank gauging ports.

During the transfer of gasoline from the cargo tank into the storage tank, the vapors contained in the headspace (empty space or ullage) of the storage tank are displaced. Rather than allowing these displaced vapors to escape directly to the atmosphere through an open vent line, Phase I components cap the vent line and establish a low resistance pathway which allows the displaced vapor to flow back into the empty compartments of the cargo tank. Phase I EVR systems currently certified by ARB are commonly referred to as a "two point" or "balance" systems. A dedicated adaptor and opening is provided for the fuel to enter the tank. A second dedicated adaptor and opening is provided for the vapors to exit the tank. To capture the vapors during fuel transfer, a flexible vapor return line is connected to the adaptors installed on the storage tank and cargo tank. Phase I components also establish leak tight seals at tank penetrations so that vapors are contained during the idle periods when no transfers take place. Typical Phase I vapor recovery components are illustrated in Figures 1 and 2.

Figure 1: Typical Phase I Vapor Recovery System for Underground Storage Tanks

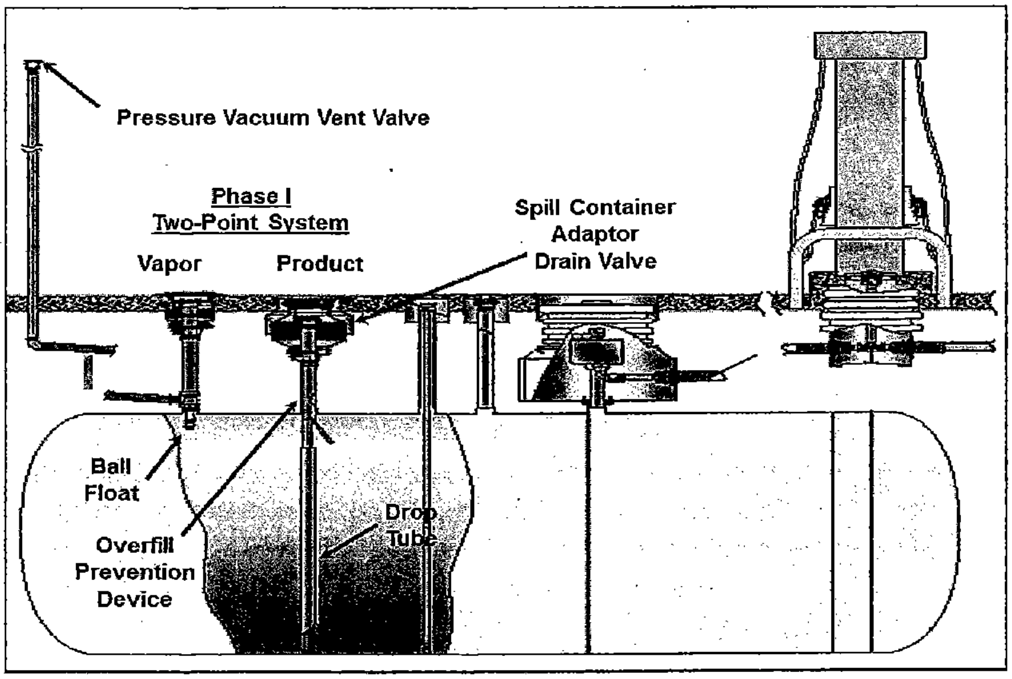
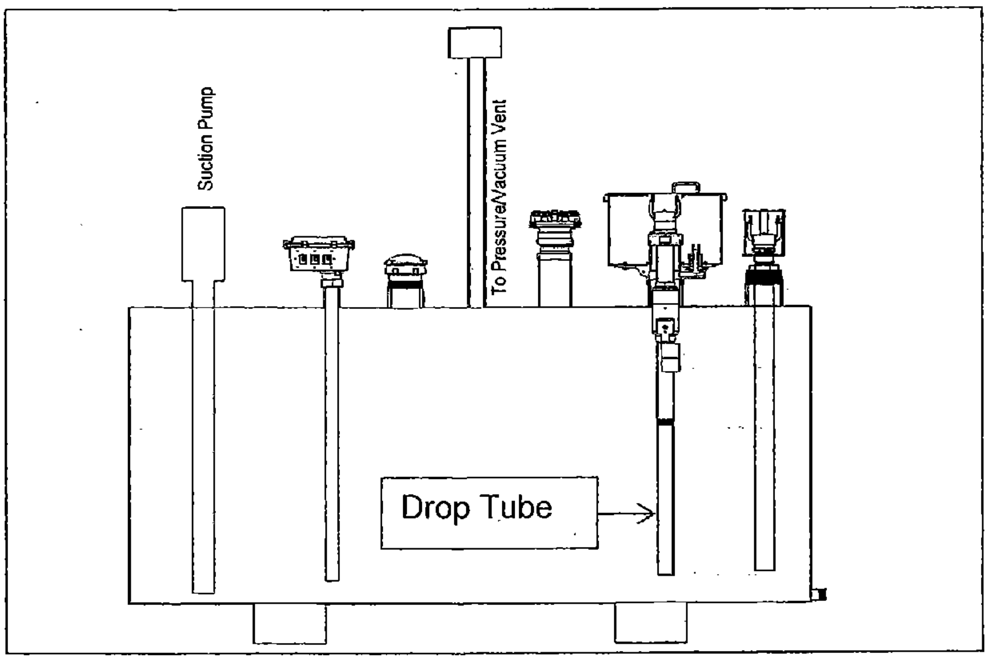


Figure 2: Typical Phase I Vapor Recovery System for Aboveground Storage Tanks



ARB Certification Phase I EVR System Performance Standards

According to ARB Certification Procedures CP-201 (applies to vapor recovery systems designed for use with USTs) and CP-206 (applies to vapor recovery systems designed for use with ASTs), Phase I EVR systems must achieve a volumetric transfer efficiency of at least 98%. In addition, Phase I EVR components must maintain leak integrity during idle periods and during periods of fuel transfer. In order to demonstrate compliance with these standards, equipment manufactures seeking ARB certification are required to install their systems at operating gasoline dispensing facilities (GDFs) in the Sacramento region. Once a system is installed, ARB certification staff will evaluate the durability and performance of the system for at least 180 days. During this time frame, a number of tests are conducted to determine whether the components can maintain leak integrity and if the system can achieve a volumetric transfer efficiency of at least 98%. Typically, the efficiency testing is conducted once every sixty days (3 times) and leak integrity testing is conducted every thirty days (6 times).

Volumetric Efficiency Testing:

Volumetric efficiency testing for Phase I EVR systems quantifies the transfer efficiency when a bulk gasoline delivery occurs between a cargo tank and either a UST or an AST. Test Procedure 201.1 (TP-201.1) is used to determine compliance with the 98% transfer efficiency performance standard specified in the certification procedure.

The principle behind TP-201.1 is that during a gasoline delivery, the cargo tank and gasoline dispensing facility (GDF) are temporarily equipped with positive displacement meters (called roots meters) that measure the volume of vapor returned to the cargo tank and the volume of vapor discharged through the vent pipe, if any. Through various recordings of temperature and pressure, these volumes are corrected to standard conditions and a collection efficiency is calculated as follows:

$$E=(100)\left[\frac{V_{returned}-V_{vent}}{V_{returned}}\right]$$

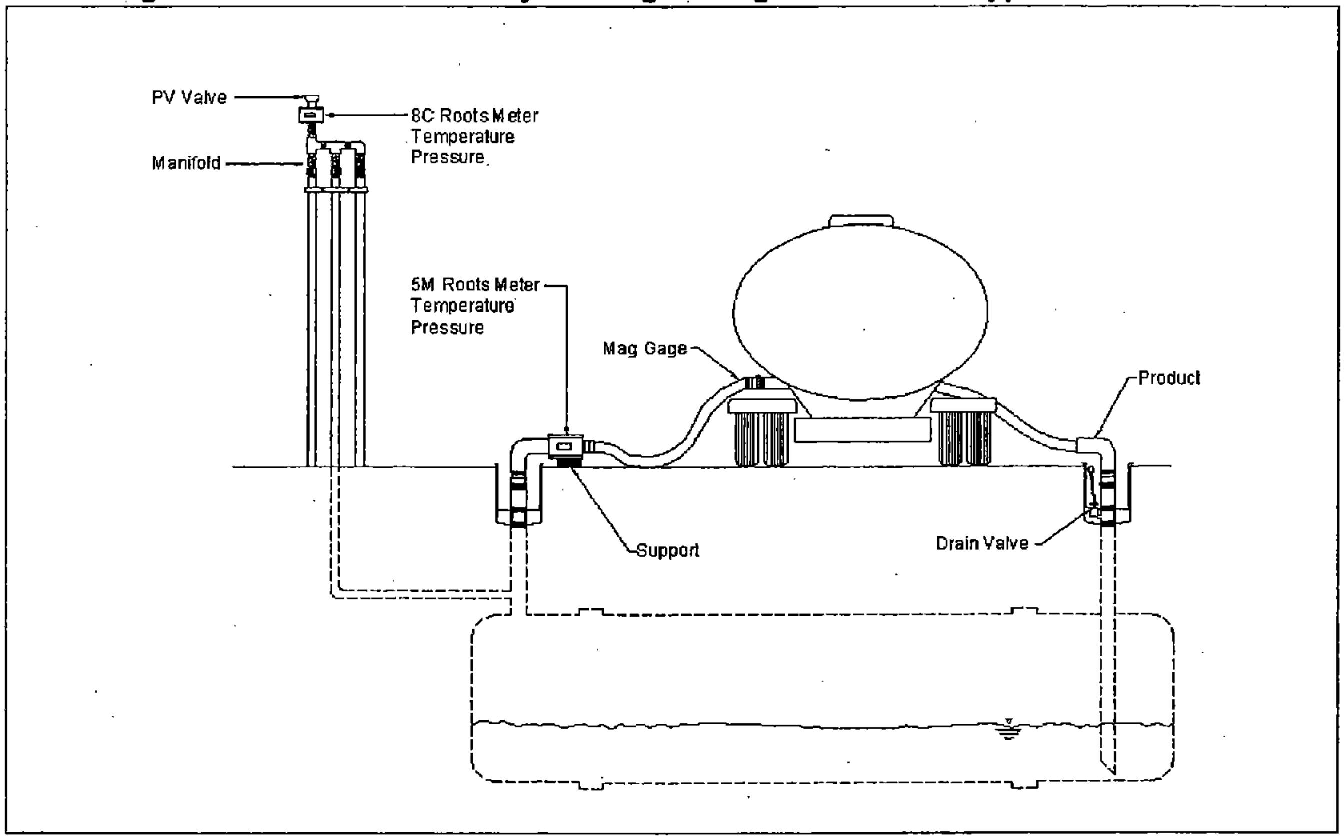
Where:

E	=	Phase I Volumetric Efficiency, percent
$V_{returned}$	=	Corrected Vapor Return Volume to Cargo Tank
V_{vent}	=	Corrected Vapor Return Volume Discharged Vent Pipe

According to the "Biases and Interferences" section of the test procedure, unusually large cargo tank headspace volumes may cause low efficiency. During the delivery, the headspace volume must range between 3% - 10% of the total tank capacity prior to delivery. Additionally, leaks in the system will bias the results, so all components must be leak tight.

Figure 3 provides a cross sectional view of a Phase I transfer and the equipment installed to measure the volume returned to the cargo tank, and volume lost through the vent line.

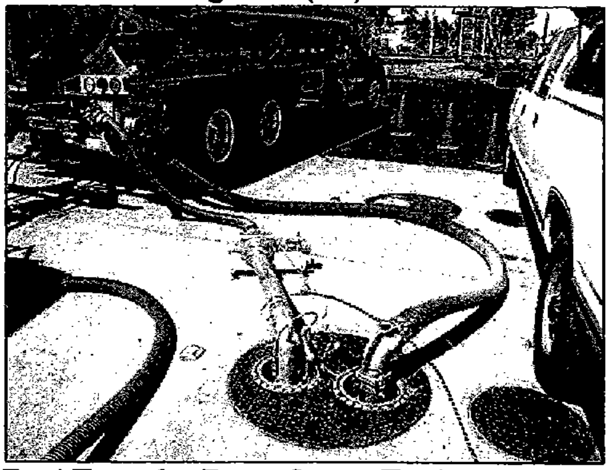
Figure 3: Phase I Efficiency Testing Configuration for a Typical UST



Medium to high volume retail GDF are normally equipped with two to three USTs, which range from 10,000 gallons to 15,000 gallons capacity each. Thus, retail GDF's may have anywhere between 30,000 to 45,000 gallons of tank capacity. During a Phase I fuel transfer into a retail GDF equipped with UST, between 8,000 – 9,000 gallons of fuel is delivered. As the liquid enters the tank, the vapors are displaced and routed back to the cargo tank. Once the cargo tank has completed the delivery, the vapors are driven back to the loading terminal and condensed back to liquid gasoline. For every gallon of product delivered, a gallon of vapor is displaced. Assuming a delivery of 8,000 gallons of liquid gasoline, then 8,000 gallons of vapor should be captured by the truck. If the system is working properly, very little to no vapor volume should be lost through the vent line.

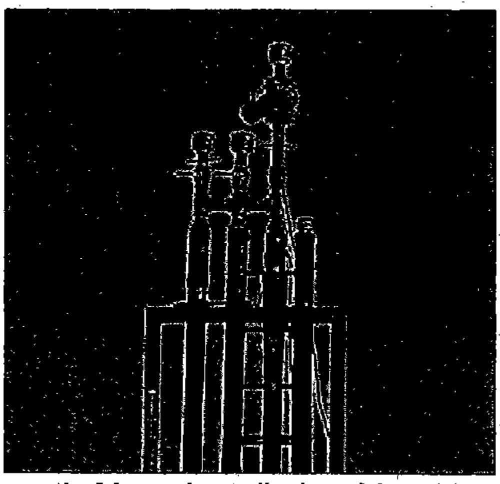
Figures 4(a-f) provide images of various efficiency testing conducted at gasoline dispensing facilities equipped with USTs. Figures 5(a-f) provide images of efficiency testing conducted at gasoline dispensing facilities equipped with ASTs.

Figure 4(a-f): Phase I Efficiency Testing Conducted on UST



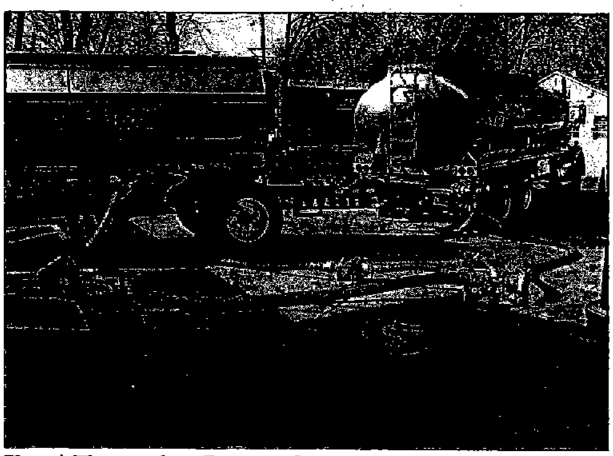
Fuel Transfer From Cargo Tank to UST
Volume Meter Installed on Vapor Return

Volume Meter Installed on Vent Line

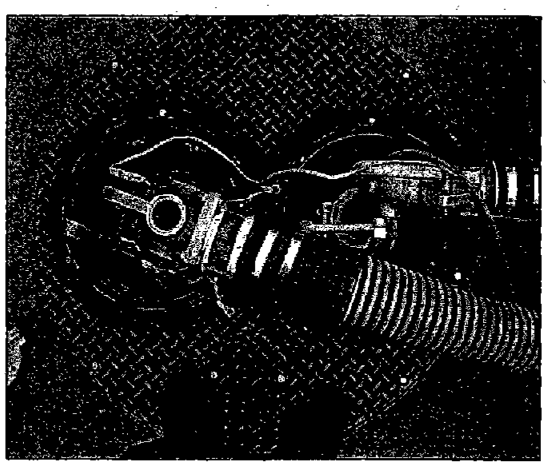


Volumetic Meter Installed on Vent Line

Fuel Transfer From Cargo Tank to UST
Volume Meter Installed on Vapor Return

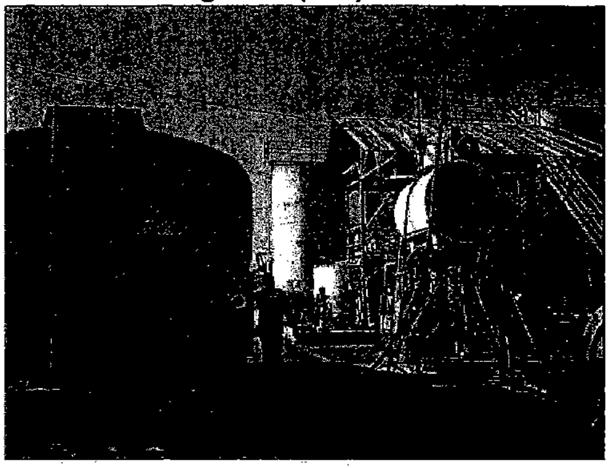


Fuel Transfer From Cargo Tank to UST
Volume Meter Installed on Vapor Return

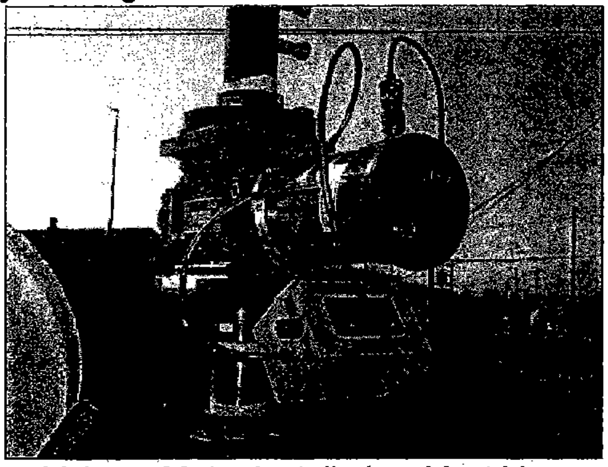


Phase I Delivery Elbows (Product and Vapor)

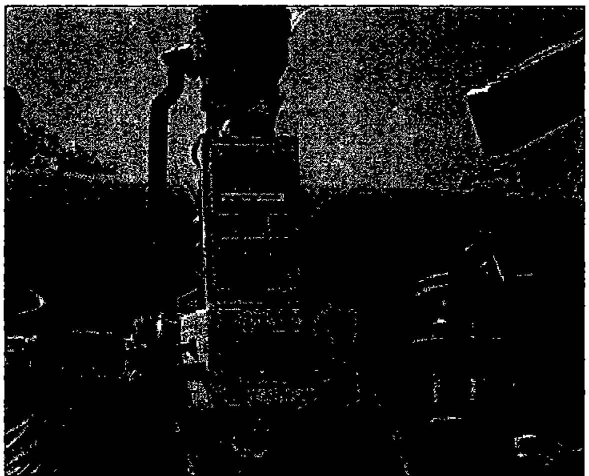
Figure 5(a-d): Phase I Efficiency Testing Conducted on AST



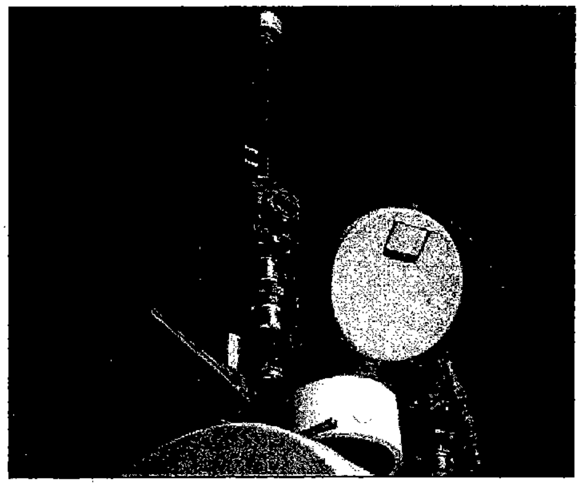
Fuel Transfer from Cargo Tank to AST



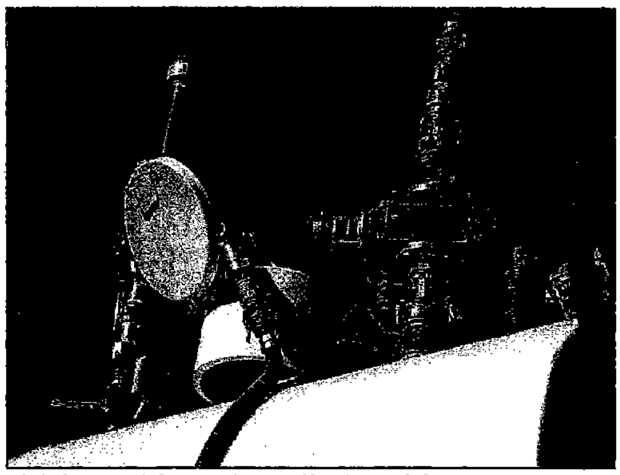
Volume Meter Installed on Vent Line



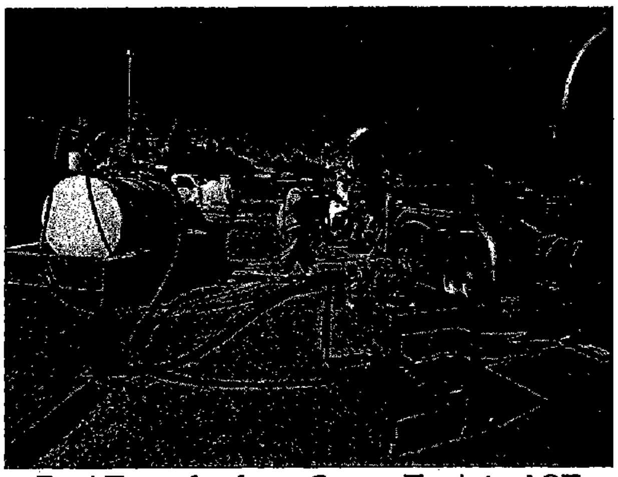
Volume Meter Installed on Vent Line



Volume Meter Installed on Vent Line



Volume Meter Installed on Vapor Return and Vent Line



Fuel Transfer from Cargo Tank to AST

Currently Certified Systems

Currently, there are a total of seven Phase I EVR systems certified by ARB for use with ASTs and USTs. Five of these systems are designed for use with USTs and two are designed for use with ASTs. The following table provides a brief description of each, note that the first UST system was certified over ten years ago. This is because the compliance deadline for existing sites to install Phase I EVR UST was April 2005. The compliance deadline for existing sites to install Phase I AST EVR is July, 2014.

Table 1: ARB Certified Phase I EVR Systems*

ARB Executive Order	System Description	Applicability	Date Initially Certified	Phase I Efficiency
VR-101	Phil Tite	UST	06/19/01	>98%
VR-102	OPW	UST	10/10/02	
VR-103	EBW	UST	09/26/03	
VR-104	CNI	UST	09/26/03	
VR-105	Emco Wheaton Retail	UST	10/20/06	
VR-401	OPW for Single Wall and Protected Tanks	AST	02/03/10	
VR-402	Morrison Brothers for Protected Tanks	AST	06/22/11	

*the above table does not include pre-EVR systems

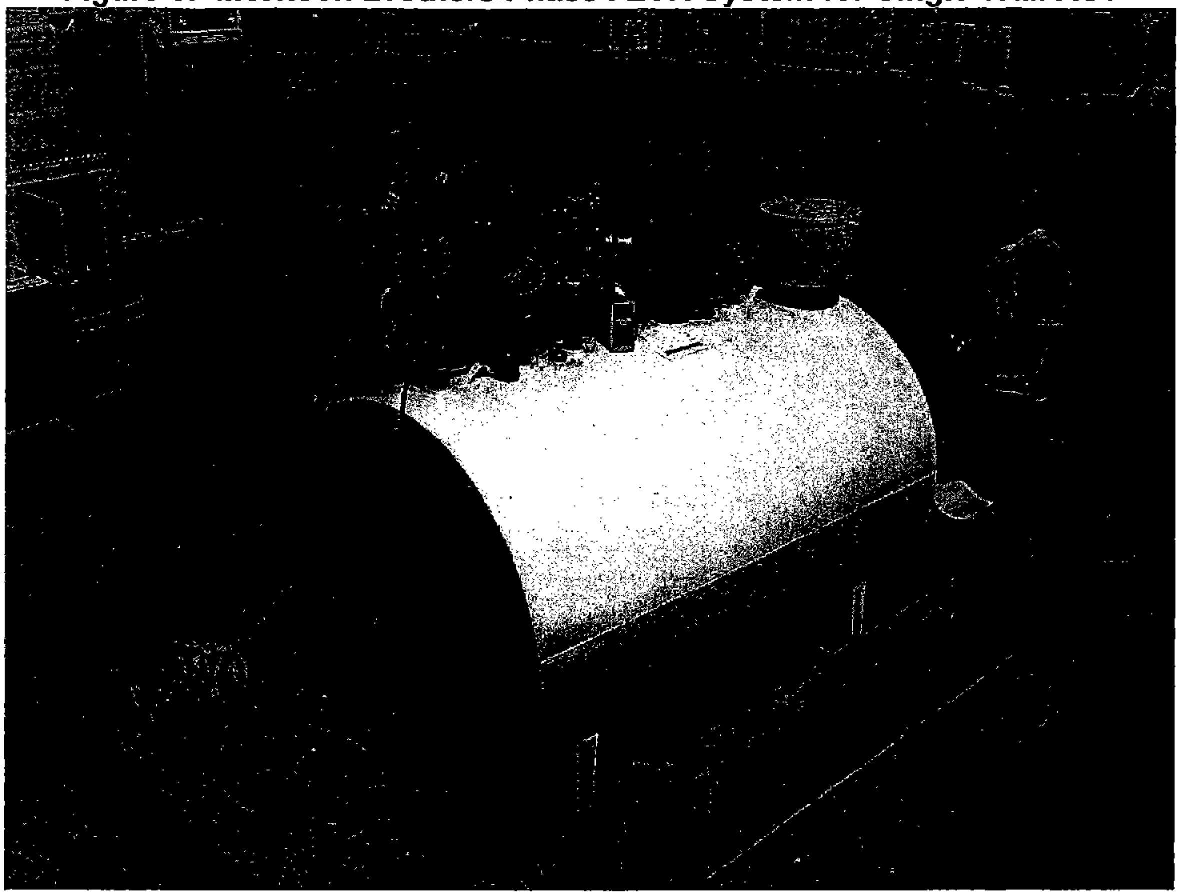
For further details, Phase I EVR System Executive Orders are available at the following webpage: http://www.arb.ca.gov/vapor/eo-evrphaseI.htm.

Results of Phase I Efficiency Testing at the Morrison Brothers Single-Wall Site

As indicated in Table 1, on June 22, 2011, a Phase I EVR system manufactured by Morrison Brothers was certified for use with protected ASTs per ARB Executive Order (EO) VR-402-A. In order to gain ARB certification for single-wall AST applications, Morrison Brothers requested certification testing on a 550-gallon single-wall AST located in Ceres, California (See Figure 6). ASTs are commonly classified as either "single-wall" or "protected". Single-wall ASTs are constructed with a primary (single) wall typically made of steel. Protected ASTs are constructed with a primary (inner) tank encased by a secondary (outer) tank, with a layer of insulating material (at least three inches thick) between the primary and secondary walls. The insulating material is usually lightweight concrete or a similar material.

On August 8, 2011, ARB staff performed initial testing which consisted of a pressure/vacuum (p/v) vent valve test and a leak decay, both of which passed, and determined that the AST and Phase I equipment was ready to initiate a 180-day test period and volumetric efficiency testing.

Figure 6: Morrison Brothers Phase I EVR System for Single Wall AST

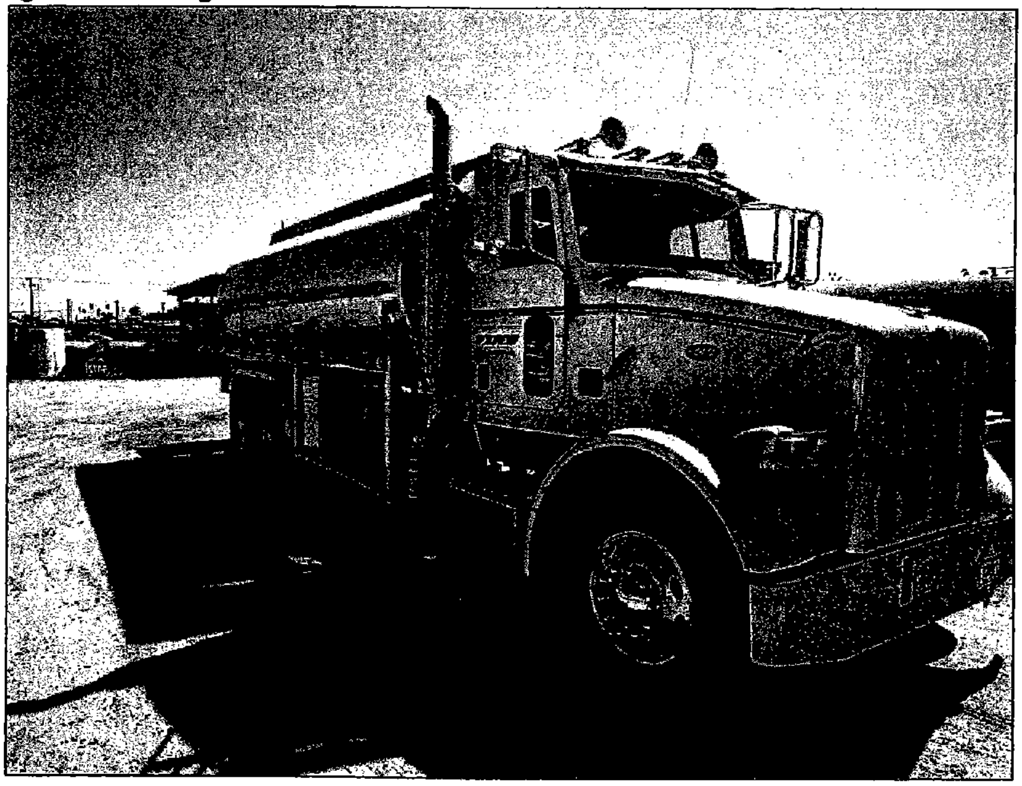


Initial Failure of Efficiency Testing: 08/25/11

After traveling to the test site to perform another set of p/v vent valve and lead decay testing, ARB staff returned to the site on August 25, 2011 to perform the Phase I volumetric efficiency testing.

At approximately 10:00 AM, ARB staff arrived on-site and installed test equipment (roots meters) on the vapor return from the AST to the cargo tank and on the vent line of the AST. The system was initially set up for a fuel drop of 280 gallons. As the vapor return line was opened and the first 58 gallons was transferred, tank pressure rose dramatically and scaled-out the manometer. The P/V valve cracking pressure was reached and vapor was lost through the vent line.

Figure 7: Cargo Tank Used to Fill AST at Morrison Brothers Test Site



At this point, ARB staff ceased the fuel drop, released the pressure on the tank via the vapor return line at the roots meter, and cleared the instruments. An exact measurement was not recorded, but over 5 cubic feet of vapor (over 37 gallons) of vapor had been lost through the P/V vent valve. The test procedure does not allow for clearing of the instruments, therefore, at this point, the system had failed the Phase I efficiency testing. This initial loss of vapor caused by a surge of pressure from the cargo tank resulted in a volumetric efficiency of 86%.

For data gathering purposes, ARB staff decided to restart the fuel drop and the Phase I efficiency testing. 222 gallons of fuel was then dropped into the AST. The roots meter at the vapor return to the cargo tank recorded 30 cubic feet, which equates to 224.4 gallons of vapor. The roots meter on the vent line recorded 0.3 cubic feet, which equates to 2.0 gallons.

Per the TP-201.1, the test is not concluded until 15 minutes after the fuel drop. If at the end of the 15 minutes, the tank pressure is greater than 1.0 inches WC, then staff must record vapor loss through the vent line for an additional 45 minutes. Immediately after the fuel drop, the AST's pressure was already greater than 2.0 inches WC. Therefore staff had to wait for a full hour.

Using the equations found in the TP-201.1 and not including the initial surge of vapor lost when the cargo tanker connected to the AST, if the numbers were run directly at the end of the fuel drop, the Phase I equipment would have passed efficiency at 99.1%.

Over the next 60 minutes, pressure on the tank grew to 3.5 inches WC and the roots meter totals grew to a total of 1.0 cubic feet, which equates to 7.7 gallons. See Table 2 for results.

At the end of the 60 minutes, the Phase I efficiency had dropped to 96.6%. It was calculated that 98% efficiency would have been reached when the roots meter on the vent line hit 0.60 cubic feet. That occurred 35 minutes into the hour waiting period.

After the failed test, ARB staff discussed the causes behind the failures. It was originally hypothesized that the cargo tank was either over-pressured as it had been filled the day before, and/or the fuel compartments on the cargo truck shared a vapor space that may have led to greater vapors being pushed through the AST.

Second Failure of Efficiency Testing: 09/08/11
Another trip was made to the test site on September 8, 2011 to run a second Phase I efficiency test. ARB staff arrived at approximately 10:00 AM and set up roots meters on vapor return and vent stack. Staff then joined the empty cargo truck at the bulk plant (see Figure 8) and observed 450 gallons of gasoline being bottom loaded into a 500 gallon compartment (See Figure 9). Staff learned that except for a shared rail space at the top of the cargo tank, vapor is only returned to the compartment utilized during fueling.

Figure 8: Bulk Plant Tanks located at the Morrison Brothers Test Site

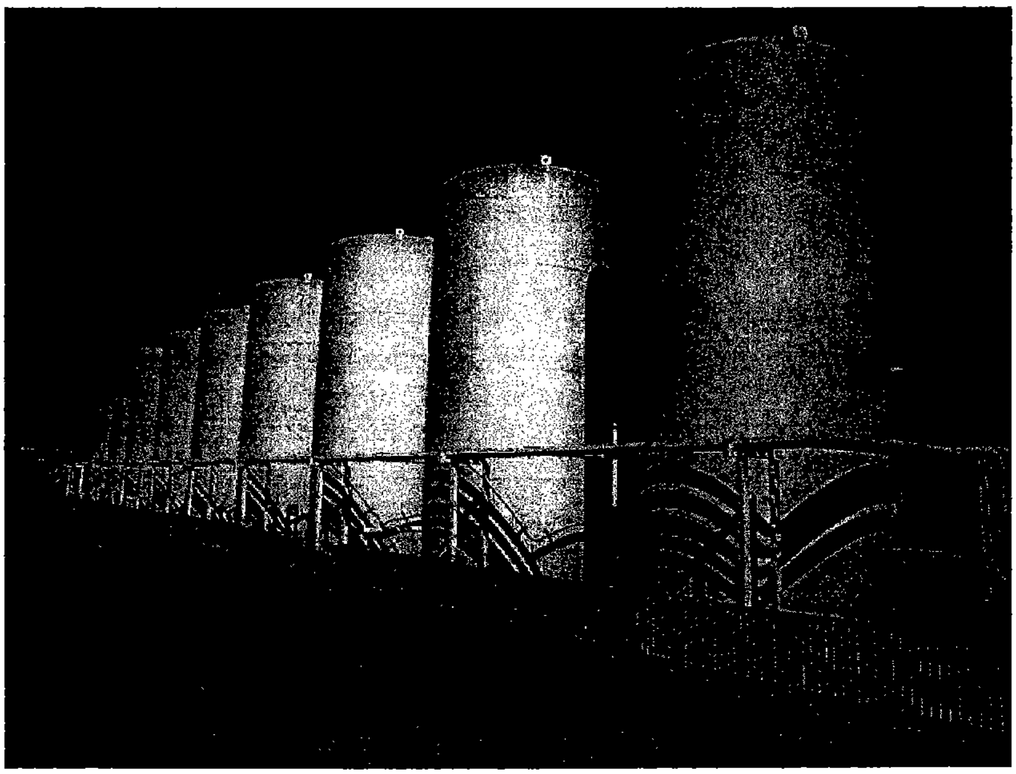


Figure 9: Bottom Loading of Cargo Tank Prior to Efficiency Testing At the Morrison Brothers Test Site

The cargo truck was then driven back to the AST site (approximately 200 feet away) and prepared for a fuel drop of 300 gallons. As soon as the vapor return was opened between the truck and the AST, the manometer was scaled-out and the P/V vent cracked. Approximately 15 cubic feet (112 gallons) of vapor was vented through the P/V valve resulting in an efficiency of 62%. The decision was made to clear the instruments and allow the tanker truck and AST to stabilize before starting the Phase I Efficiency test. Once again, this instantly failed the Phase I efficiency testing, as the test procedure does not allow for equipment to be cleared. (See Figure 10)

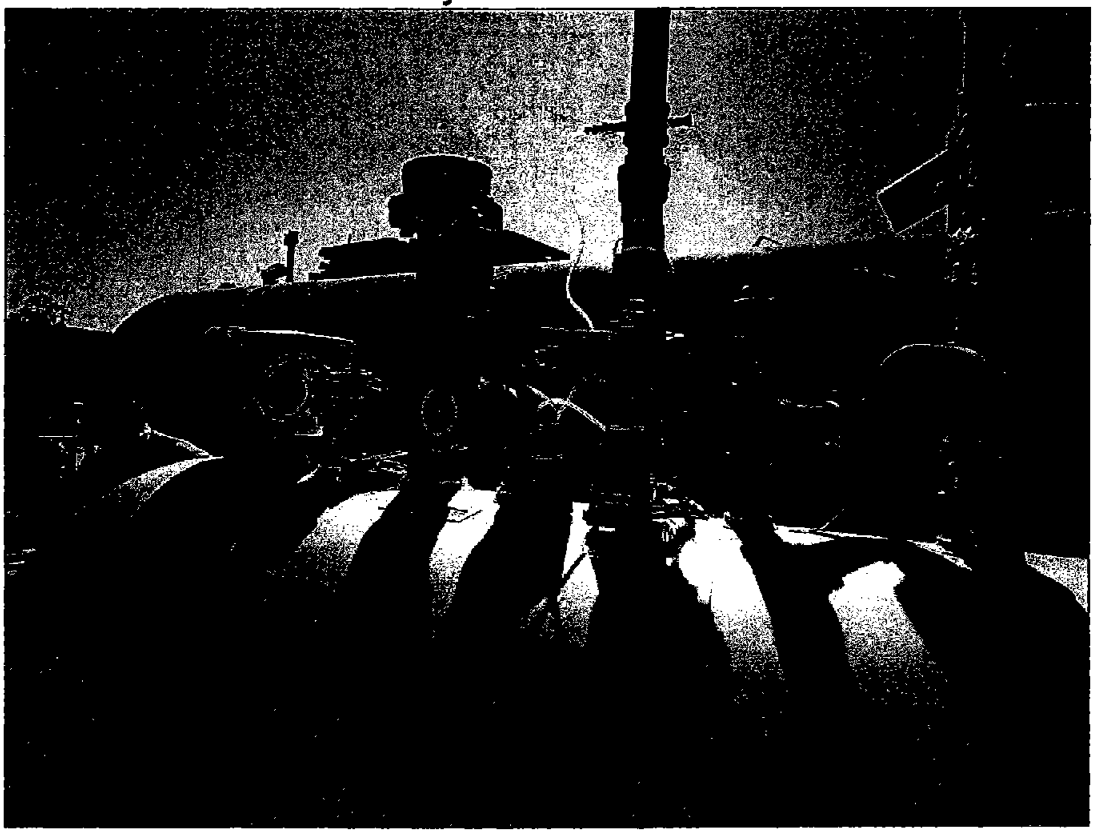
The fuel drop was initiated and temperature and pressure readings were taken from both roots meters every 15 seconds. It took approximately 5 minutes and 15 seconds to drop 300 gallons of fuel. The roots meter on the vapor return line to the cargo tank recorded 42 cubic feet, which equates to 314.2 gallons of vapor. The roots meter on the vent line had a zero reading, providing for an efficiency of 100% directly at the end of the fuel drop.

However, at the end of the fuel drop, the tank pressure was 2.8 inches of WC. Therefore, per the TP, the AST had to be monitored for a full 60 minutes before efficiency could be determined. Over the next 60 minutes, pressure on the tank grew to

3.6 inches of WC and the roots meter totals grew to a total of 1.1 cubic feet, which equates to 8.5 gallons. The equation done at the end provided an efficiency of 97.3%. See Table 2 for results.

It was calculated that a passing 98% efficiency would have been reached when the roots meter on the vent line hit 0.84 cubic feet. That occurred 43 minutes into the hour waiting period.

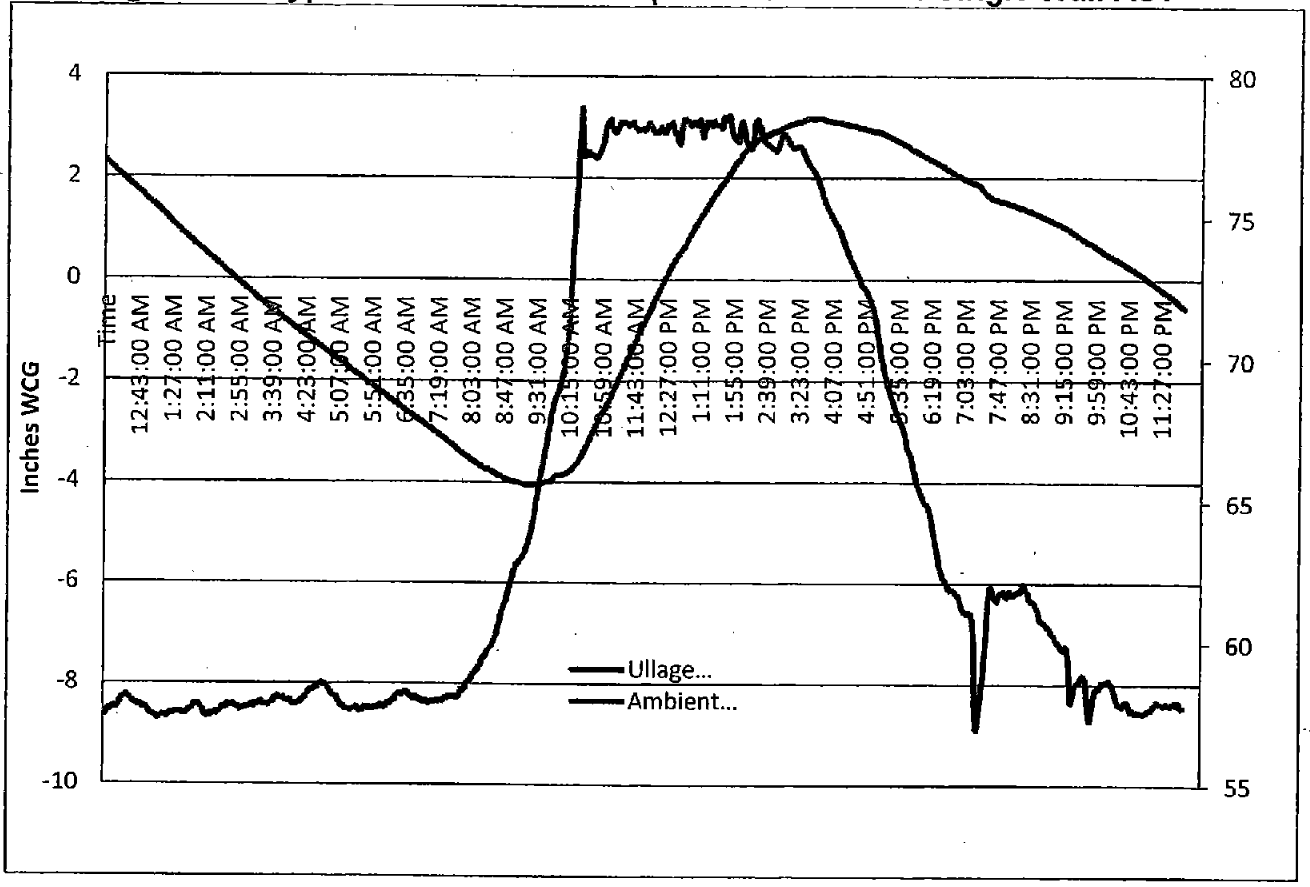
Figure 10: Measurement of Headspace Pressure, Temperature, and Vent Volume after Fuel Delivery at Morison Brothers Test Site



Third Failure of Efficiency Testing: 12/15/11

On December 15, 2011, ARB staff arrived at approximately 7:00 AM to perform the third Phase I Efficiency Test. Discussion between ARB and Morrison Brothers staff resulted in the hypothesis that direct sunlight as well as ambient and fuel temperature may play a role in the pressurization of the AST during and after the Phase I transfer of fuel to the AST (See Figure 11). The cargo tank was again loaded immediately before the start of the Phase I Efficiency testing, and all certification testing equipment and delivery equipment was connected appropriately. The internal pressure of the AST was allowed to stabilize before the delivery was initiated.

Figure 11: Typical Pressure vs. Temperature Profile of Single Wall AST



During the delivery, 300 gallons of fuel was delivered into a tank that contained approximately 100 gallons of fuel. At the end of the delivery 38 CF (284.3 gallons) of vapor was returned to the cargo tank and. 0.4 CF (3.1 gallons) of vapor was lost through the vent line on the AST. If the test had ended at the conclusion of the fueling, then efficiency would have been 98.9%, however AST pressure was at 3.8 inches of WC and the test had to continue for an hour. After the one hour wait, 0.95 CF (7.1 gallons) of vapor was lost through the vent line on the AST, resulting in a total efficiency of 97.5%. See Table 2 for results.

It was calculated that the minimum passing of 98% efficiency would have been reached when the roots meter on the vent line hit 0.8 cubic feet. That occurred approximately 30 minutes into the hour waiting period.

<u>Fourth Efficiency Test: 02/01/12</u>

On February 1, 2012, ARB staff performed a fourth Phase I Efficiency Test. Building upon the data gather from the previous three failures, ARB staff determined that the optimum circumstances would be to run the Phase I Efficiency test while ambient and fuel temperatures were low, and while there was the greatest available ullage in the AST and delivering the highest volume of fuel. It was hypothesized that a nearly empty

AST prior to delivery would decrease the agitation of warmer, existing fuel, while filling to AST to near capacity would decrease the headspace in which fuel could volatize.

In preparation, Morrison Brothers nearly emptied (less than 10% of total fuel volume remained) the 550-gallon AST to ensure the greatest ullage volume. Then 478.5 gallons of fuel was delivered to the AST. The measured vapor return to the delivery truck was 65.8 CF, or 492.2 gallons. At the end of the delivery, 0.3 CF (2.1 gallons) had been lost through the P/V vent valve. After waiting for the required hour, 0.6 CF (4.7 gallons) had been lost, resulting in a passing Efficiency of 99.0%. See Table 2 for results.

Table 2: Results of Phase I Efficiency Testing on Single Wall 550-gallon AST

Date	Pass/Fail*	Efficiency %	Vent Volume (at end of 60 minute wait)	Vent Volume (at End of Fuel Drop)	Efficiency % (at end of fuel drop)
8/25/11	Fail	96.6%	1.0 CF (7.7 gallons)	0.3 CF (2.02 gallons)	99.1%
9/8/11	Fail	97.3%	1.1 CF (8.5 gallons)	0 CF (0 gallons)	100%
12/15/11	Fail	97.5%	0.9 CF (7.1 gallons)	0.4 CF (3.1 gallons)	98.8%
2/1/12	Pass	99.0%	0.6 CF (4.7 gallons)	0.3 CF (2.1 gallons)	99.2%
*A passing Efficiency is 98%					

Reasoning

While ARB and Morrison Brothers staff eventually had a passing Phase I Efficiency test, the fact that the Phase I system failed three times was troubling. Through engineering evaluations and internal and external discussion, it was determined that the fault of the failures lay not in the design of the Phase I system, which had successfully passed Phase I Efficiency testing on a protected AST, but in the single-wall AST and it's applied standing loss control system. An existing single-wall AST with certified standing loss control will emit hydrocarbons through the P/V vent valve due to pressurization during heating and cooling cycles (pressure-driven vent line emissions).

Other factors, such as a small fuel delivery, a greater volume of existing fuel in the AST prior to delivery, and a greater ullage volume left in the AST after delivery, all working in concert with the design of the single-wall AST and standing loss control application to create greater pressurization of the AST during delivery and during the TP-201.1 required one-hour waiting period to result in hydrocarbon emission that bias the Phase I Efficiency test results towards failure.

Unlike USTs, which are larger and insulated by backfill material, ASTs typically found at gasoline dispensing facilities are significantly smaller and subject to greater diurnal temperature variations. When the volatile liquid gasoline vaporizes, the smaller AST is far more likely to be subject to rapid increases in ullage pressure, which results in greater pressure-driven vent line emissions, as illustrated in Figure 11. These diurnal AST emissions are subject to and captured by the separate standards of standing loss control. Therefore, the longer an AST sits idle, the greater the chance of hydrocarbon pressurization and possible vent line emissions. Including the standing loss control vent emissions that occur in the idle period after a delivery biases the Phase I Efficiency test results towards failure.

Recommendation

Vent line emissions that bias the results of TP-201.1 towards failure can be attributed to the standing losses that readily occur on single wall AST. The small tank size and rapid temperature fluctuations found in ASTs was not considered when TP-201.1 was originally written and applied to both USTs and ASTs. Therefore, to prevent the double-counting of these emissions while performing the Phase I Efficiency test on ASTs, ARB staff recommends modifying portions of TP-201.1 to address those conditions that are specific to ASTs.

Specifically, ARB staff has two recommendations. First, due to fact that small ASTs operate at higher internal pressures and that the vapor space of fuel delivery truck is generally under pressure when it arrives at the gasoline dispensing facility and connects to the waiting AST, greater pressurization of the AST can occur before the delivery even begins. To prevent emissions that occur because of this pressurization from biasing the testing during delivery, ARB staff recommends that the cargo truck and AST be allowed to stabilize and any emissions registered on the totalizer prior to commencement of delivery be reset to zero.

Secondly, due to standing loss emissions being counted twice while performing TP-201.1, ARB staff recommends the removal of the waiting period after a delivery has been made for ASTs only. The venting which occurs after the delivery from the cargo tank is completed is unrelated to the performance of the Phase I EVR system, and including that venting in the Phase I efficiency calculations, as required by the current procedure, biases the test towards failure.

APPENDIX J

Public Process for Development of the Proposed Amendments

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

October 9, 2012

To All Vapor Recovery Stakeholders:

The California Air Resources Board (ARB or Board) staff is holding three public workshops to discuss a draft regulatory proposal for amendments to the Enhanced Vapor Recovery (EVR) program for Gasoline Dispensing Facilities (GDFs).

The time and place for the workshops are as follows:

Northern California		Southern California	
Date:	Wednesday, October 31, 2012	**Date:**	Friday, November 2, 2012
Time:	10:00 a.m. to 3:00 p.m.	**Time:**	10:00 a.m. to 3:00 p.m.
Place:	Cal/EPA Headquarters Byron Sher Auditorium, 2nd Floor 1001 I Street Sacramento, CA 95814	**Place**	South Coast AQMD Headquarters Conference Room GB 21865 Copley Drive Diamond Bar, CA, 91765

Central California	
Date:	Wednesday, November 7, 2012
Time:	10:00 a.m. to 3:00 p.m.
Place:	San Joaquin Valley APCD Headquarters Governing Board Room 1990 East Gettysburg Fresno, CA 93726

Meeting locations are accessible to persons with disabilities. If special accommodations or language needs are required, please contact Elizabeth Mongar or Carolina Zavala at (916) 327-0900 as soon as possible. TTY/TDD Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

TELECONFERENCE:
To participate via teleconference, dial toll free 877-918-6704, enter participant passcode 6525287 followed by the # sign. The teleconference will be a listen only.

BACKGROUND:
On May 16, 2012, the U.S Environmental Protection Agency (EPA) determined that on-board refueling vapor recovery (ORVR) equipped vehicles will be in widespread use by May 16, 2012. Based on this determination, EPA will now allow states to consider waiving Stage II[1] vapor recovery requirements. Despite progress in achieving cleaner air, California still needs additional reductions in air pollution. Removal of Phase II EVR would result in a significant increase in emissions. At this time, ARB cannot identify how to make up for the lost emission reductions that would result from the removal of Phase II vapor recovery systems. In addition, removal of Phase II would increase

[1] Federal Stage II is less stringent than California Phase II EVR.

benzene exposure to citizens refueling older, non ORVR equipped vehicles, and those living near service stations. For these reasons, Phase II will not be removed in California for the foreseeable future. However, in light of the EPA determination and increased ORVR penetration, ARB recognizes the need to thoroughly review the EVR program and identify areas for improvements. Implementation of some improvements will result in lower costs.

TOPICS:
All three workshops will cover the following topics:

- Discussion of the EPA ORVR Widespread Use Determination
- Rationale for ARB's Continued Use of Phase II EVR
- Staff Proposals to Reduce EVR Operation and Maintenance Costs
- Staff Proposals for Technical Improvements to EVR
- Staff Proposals to Revise and Streamline Field Test Procedures
- Proposed Regulatory Solution to Provide Relief for In-Station Diagnostics (ISD) Overpressure Alarms

WORKSHOP FORMAT:
This workshop will include a morning presentation covering the above topics. At the conclusion of each topic, there will be an opportunity to ask questions and provide feedback. If necessary, ARB staff will be available in the afternoon to respond to additional questions and to solicit stakeholder feedback. In addition, a more detailed presentation pertaining to the ISD overpressure issue will be provided in the afternoon.

Copies of the agenda and parking information for all three locations will be posted on the *Future of Vapor Recovery Rulemaking* web page at http://www.arb.ca.gov/vapor/vapor.htm by October 23, 2012. The workshop presentation will be posted at the above web page sometime before the first workshop scheduled for October 31st.

If you have technical questions regarding these workshops, please contact Scott Bacon at (916) 322 8949 or via email at sbacon@arb.ca.gov. For general non-technical questions, please call (916) 327-0900.

Sincerely,

George Lew

George Lew, Chief
Engineering and Certification Branch
Monitoring and Laboratory Division

cc: See next page.

cc: Danny Luong
South Coast Air Quality Management District

Dillon Collins
San Joaquin Valley Air Pollution Control District

California Environmental Protection Agency
Air Resources Board

The Future of EVR (Enhanced Vapor Recovery)

Conceptual Workshops
October 31, 2012 - Sacramento
November 2, 2012 - Diamond Bar
November 7, 2012 - Fresno

Presentation Outline

1. Vapor Recovery Program Background
2. ARB Response to U.S. EPA Widespread Use Determination
3. EVR Program Improvements
4. Project Timeline / Contact Information

VAPOR RECOVERY PROGRAM BACKGROUND

Emissions Reductions Vapor Recovery Program

- Vapor recovery is a major control strategy for clean air
- Provides more hydrocarbon emission reductions than low emission vehicles and cleaner burning gasoline
- Contributes towards meeting ozone standards
- Reduces exposure to benzene, a known carcinogen

ORVR/Phase II Background

- Two Control Systems Targeting the Same Emission Source (vapor displaced during vehicle fueling)
  - Phase II/Stage II[1] Vapor Recovery, gasoline dispensing facility (GDF) based, achieved by coaxial nozzles, coaxial hoses, dedicated vapor return piping
  - Onboard Refueling Vapor Recovery (ORVR), vehicle based, achieved by liquid sealed fill pipe, on board carbon canister

[1] Federal Stage II does not include many of the controls required by California Phase II Enhanced Vapor Recovery

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5

ORVR Widespread Use Determination

- U.S. EPA determined that widespread use occurred on May 16, 2012, when over 75% of gasoline is dispensed to ORVR vehicles
- Allows states to consider removing Stage II requirements when revising State Implementation Plans if doing so would not interfere with applicable Clean Air Act requirements
- U.S. EPA issued guidance for Stage II removal
- ARB staff determined that guidance do not apply to California

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6

CA Will Retain Phase II EVR

- Most of CA is nonattainment for ozone
  - Phase II EVR reduces emissions by 31 tons/day in 2014; 9 tons/day in 2028
- Benzene Air Toxic Control Measure
  - ARB is mandated to mitigate risk of benzene exposure
  - Current ATCM requires Phase II at retail GDFs
  - Removing Phase II would likely increase risk
  - Environmental justice implications

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7

Rationale for Continued Use of Phase II

CA Phase II EVR achieves more emission reductions than Federal Stage II

Program Components	EVR Phase II In California	Stage II in other States
Control of Vapor Displaced during Vehicle Fueling	included	included
ORVR Compatibility/Pressure Management	Included	none (except Texas & Missouri)
In Station Diagnostics (ISD)	included	none
Nozzle Liquid Retention, Dripless Spillage	Included	none
[illegible]	[illegible]	none

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8

EVR PROGRAM IMPROVEMENTS

EVR Program Improvements
Overview

On September 8, 2011, ARB's formal response to U.S. EPA's widespread use determination included the following statement:

> *"ARB staff plans to work in cooperation with local air quality management districts to identify ways that additional benefits and reductions in operating costs can be realized."*

EVR Program Improvements
Overview

- Staff has begun a comprehensive review of the EVR program with a focus on:
  - Reducing EVR related operation and maintenance costs
  - Identifying opportunities for technical improvement
  - Reducing GDF emissions where it is practical and cost-effective

EVR Program Improvements

1. <u>Operation and Maintenance (O & M) Cost Reduction Measures</u>
2. ISD Over Pressure Alarm Solution
3. ORVR Fleet Nozzle
4. Revised Test Procedures
5. Reduced EVR Nozzle Spillage Standard

EVR Related Operational & Maintenance Costs

ISD Alarm Response	Annual Compliance Testing
Station Down Time	Replacement Parts

Factors Which Contribute to O&M Cost

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13

O&M Cost Reduction Measures

Thirteen cost reduction measures have been identified/suggested by ARB and Air Districts

- Ease financial burden of EVR implementation, yet maintain compliance
- Apply to GDF equipped with both UST and AST
- Require regulatory and administrative changes by ARB and Air Districts

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14

O&M Cost Reduction Measures

#	Tank Type	Concept
1	UST	Revise ISD alarm response policy to be less prescriptive, less complex
2	UST	Provide long term relief from ISD overpressure alarms
3	UST	Add compliance testing featurë / mode to ISD system
4	UST	Enable "Mixing and Matching" of Phase II EVR system components

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15

O&M Cost Reduction Measures (continued)

#	Tank Type	Concept
5	UST	Develop "streamlined repair verification" function for ISD system
6	UST	Revise sequencing of ISD flow meter operability test procedure
7	AST	Enable alternate Phase I EVR installation configurations for existing AST, deem some configurations exempt due to incompatibility

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16

O&M Cost Reduction Measures (continued)

#	Tank Type	Concept
8	UST & AST	Provide mechanism to track / monitor equipment failures via web based component complaint form[1]
9	UST & AST	Conduct random audits of vapor recovery components at equipment distributors and GDFs, work with manufacturers on resolving issues found during the audits
10	UST & AST	Work with equipment manufacturers in standardizing requirements for their contractor training programs

[1] http://www.arb.ca.gov/vapor/in_use/complaint_form.htm

O&M Cost Reduction Measures (continued)

#	Tank Type	Concept
11	UST	Issue bulletin regarding decommissioning of ISD when GDF throughput drops below 600,000 gallons per year
12	UST & AST	Certify nozzles for GDFs serving ORVR fleets
13	UST & AST	Drain valve optional for Phase I EVR system spill containers

EVR Program Improvements

1. Operation and Maintenance (O & M) Cost Reduction Measures
2. <u>ISD Over Pressure Alarm Solution</u>
3. ORVR Fleet Nozzle
4. Revised Test Procedures
5. Reduced EVR Nozzle Spillage Standard

ISD Over Pressure Alarm Solution

- Numerous ISD over pressure (OP) alarms occur during November through February
  - Significant cost to respond to alarms
  - Most alarms are not due to equipment problems
  - No emissions reduction from most alarm response
- Advisory 405-B, an interim measure to provide relief for winter season OP alarms
  - A more permanent solution is needed

ISD Over Pressure Alarm Solution

- Conclusions from ARB study:
  - Most alarms occur between November and February are associated with high volatility fuel
  - Not all GDFs experience OP alarms
  - Current alarm criteria do not reliably identify equipment problems
  - Further control of pressure to meet current alarm criteria would not be cost effective or significantly improve overall control for GDFs

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21

ISD Over Pressure Alarm Solution

- A new alarm criteria is being considered which includes the following:
  - Based on pressure-driven emission factor
  - Would require new ISD software
  - Identifies when efficiency loss approaches 5%
  - Identifies equipment failures and eliminates nuisance alarms
- New ISD software would be optional for existing GDFs and required for new GDFs; Advisory 405-B would be rescinded

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22

EVR Program Improvements

1. Operation and Maintenance (O & M) Cost Reduction Measures
2. ISD Over Pressure Alarm Solution
3. <u>ORVR Fleet Nozzle</u>
4. Revised Test Procedures
5. Reduced EVR Nozzle Spillage Standard

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23

ORVR Fleet Nozzles

- Many Air Districts allow ORVR fleet GDFs to operate without Phase II EVR
  - 2/20/2008 Letter from ARB to Air Districts
  - Consistent with U.S. EPA Memo
- Typically applied to car rental, corporate or government fleet fueling facilities
- Approximately 330 facilities in CA
  - About half use EVR nozzles, about half use conventional

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24

ORVR Fleet Nozzles

- Incorporates Phase II EVR standards for spillage, drips, liquid retention, and spitting
- Nozzle spitting criteria would likely necessitate some form of interlock
  - Nozzle boot may be needed for interlock
- Costs are under review at this time
  - More than current conventional nozzles, less than EVR nozzles

EVR Program Improvements

1. Operation and Maintenance (O & M) Cost Reduction Measures
2. ISD Over Pressure Alarm Solution
3. ORVR Fleet Nozzle
4. Revised Test Procedures
5. Reduced EVR Nozzle Spillage Standard

Revised Test Procedures

Overview

- Establish a workgroup with members from ARB, Air Districts, and Testing Companies
- Review all EVR test procedures, update as needed to meet the following 5 criteria:
  - Relevance, Cost, Emissions, Consistency, Accuracy
- Involves changes to Executive Orders and regulations

Revised Test Procedures

- Ideas being considered include:
  - Look for redundant or outdated tests
  - Develop abbreviated and full versions of tests
    - Abbreviated versions used if certain conditions are met
    - Full versions used when conditions are not met or results of abbreviated version are inconclusive
  - Utilize ISD sensors and data where appropriate
  - Establish guidelines for test sequencing

EVR Program Improvements

1. Operation and Maintenance (O & M) Cost Reduction Measures
2. ISD Over Pressure Alarm Solution
3. ORVR Fleet Nozzle
4. Revised Test Procedures
5. <u>Reduced EVR Nozzle Spillage Standard</u>

Reduced EVR Nozzle Spillage Standard

- All EVR nozzles performed well below the current 0.24 lbs./1000 gallon standard during certification testing
- A lower spillage standard allows us to claim the reductions we have already achieved
- Proposal will be 0.10 lbs./1000 gal
- All currently certified EVR nozzles comply with the proposed standard

PROJECT TIMELINE & CONTACT INFORMATION

Project Timeline

- Oct/Nov 2012 – Conceptual Workshop
- February 2013 – Detailed Workshop
- April/May 2013 – Begin Formal Comment Period
- July/August 2013 – Rulemaking Board Hearing

Comments

- We are looking for your comments or suggestions for additional program improvement measures.
- E-mail: sbacon@arb.ca.gov
- Mail: Air Resources Board
  Monitoring and Laboratory Division
  Attention: Scott Bacon
  P.O. Box 2815
  Sacramento, CA 95812-2815
- Please submit comments or suggestions by November 26, 2012

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33

Contact Information

Project Component	Staff	Contact Info
Coordinator	Scott Bacon	(916) 322-8949 sbacon@arb.ca.gov
O & M Cost Reduction	Lou Dinkler	(916) 324-9487 ldinkler@arb.ca.gov
CP/TP Revisions, Nozzle Spillage	Pat Bennett	(916) 322-8959 pbennett@arb.ca.gov
ORVR Fleet Nozzles	Paul Marzilli	(916) 445-7431 pmarzill@arb.ca.gov
ISD Over Pressure	John Marconi	(916) 323-6752 jmarconi@arb.ca.gov
Emission Inventory	Angus Macpherson	(916) 445-4686 amacpher@arb.ca.gov

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34

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Regulatory Solution to Provide Relief from In-Station Diagnostics (ISD) Over Pressure (OP) Alarms

Conceptual Workshops
October 31, 2012 - Sacramento
November 2, 2012 - Diamond Bar
November 7, 2012 - Fresno

Presentation Outline

- Section 1: Background
- Section 2: OP Study Description
- Section 3: OP Study Conclusions
- Section 4: Proposed ISD Standard

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Background

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EVR/ISD Implementation

- Phase II EVR including ISD fully implemented in 2010.
- Approximately 10,000 GDFs were upgraded to EVR with approximately 8,000 GDFs upgrading to EVR with ISD.
- GDFs with an annual throughput greater than 600,000 gallons are subject to ISD.

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ISD Performance Assessments

- ISD continuously monitors the performance of the vapor recovery system (VRS) and alerts the operator when failures are detected.
  - One of the assessments performed by ISD involves continuous monitoring of pressure in the headspace of the underground storage tank.
  - "Over Pressure" means that one of the ISD thresholds illustrated in the next slide have been exceeded.

Current ISD OP Alarm Criteria

Assessment Period	Current ISD OP Alarm Criteria
Weekly Assessment	5% of pressure data above 1.5"WC (CARB CP-201 Section 9.2.4).
Monthly Assessment	25% of pressure data above 0.5"WC (CARB CP-201 Section 9.2.4).
Daily Assessment (Processors Only)	Daily assessment to identify vapor processor malfunction (CARB CP-201 Section 9.2.5).

ISD OP Alarm Problem Defined

- A situation in which the equipment inspection, testing, and troubleshooting conducted in response to an ISD OP alarm fails to identify any equipment malfunction.

Relief from OP Alarms

Advisory	Issued	Expiration
405	10/6/09	9/1/10
405-A	11/8/10	4/1/11
405-B	10/10/11	Remains in effect until rescinded

OP Study Description

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OP Study

- Purpose was to determine cause of OP alarms during the winter fuel season and to quantify emissions caused by positive pressure.
  - Duration of Study: November 2009 - March 2012
  - Six GDFs located in the Sacramento area selected to obtain variability in throughput, operating hours, VRS, and ISD system.
  - ISD alarm history and service records collected from:
    - GDFs located in Sacramento and San Diego region
    - Major Oil companies

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OP Study Conclusions

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Conclusion #1 - No Trouble Found (NTF) in Most OP Alarm Responses

- During the winter, about 90% of OP alarms are not related to a vapor recovery equipment failure or malfunction.
- During the summer, about 70% of OP alarms are not related to a vapor recovery equipment failure or malfunction.

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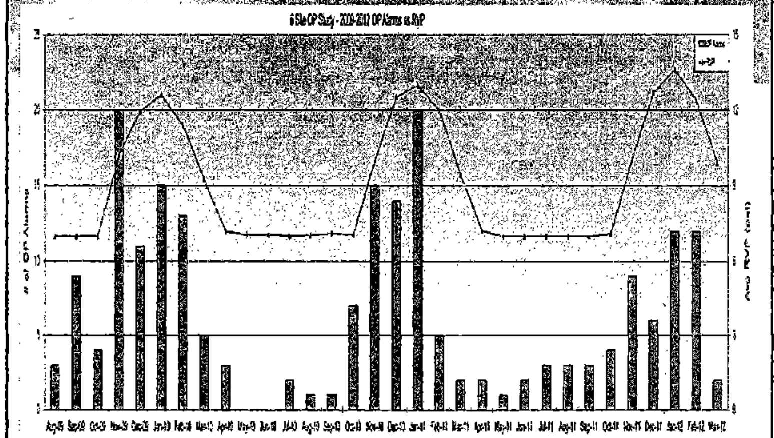
Conclusion #2 – Effect of Winter Fuel

- OP alarms increase significantly in the winter because of high Reid Vapor Pressure (RVP) fuel.
- OP alarms occur during periods of low gasoline dispensing rates and/or extended shut downs.

Conclusion #2 – Effect of Winter Fuel



Conclusion #3 – Stringency of ISD Performance Standards

- The ISD pressure profile standards can be more stringent than the pressure profile standard required for VRS certification.
- With the exception of ISD monitoring for OP, the ISD thresholds are less stringent than the standards for VRS certification.

Conclusion #4 – Emissions Associated with Positive Pressure

- Annual averaged statewide emissions associated with positive pressure from certified EVR systems do not exceed 1 ton per day.

Conclusion #5 – Effect of Leaks on Over Pressure Alarms

- Systems with poor static pressure performance have a lower tendency to experience over pressure alarms.

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17

Proposed ISD Standard

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18

Proposed ISD Standard

- New ISD alarm criteria based on an estimate of emission factors (winter and summer) for pressure driven emission sources.
- New ISD alarm criteria for processor performance.
- New PV valve performance standard that allows vent line emissions to be quantified.

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19

Benefits of Proposed ISD Standard

- OP alarms more likely to identify an equipment malfunction.
- >85% reduction in OP alarms.
- Reduction in OP alarm response cost.

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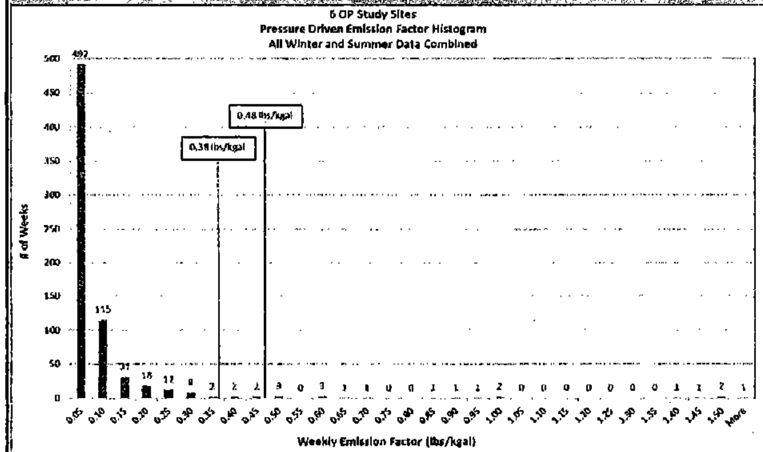
20

Current vs Proposed

Assessment Period	Current ISD OP Alarm Criteria	Proposed ISD OP Alarm Criteria
Weekly Assessment	5% of pressure data above 1.5"WC (CARB CP-201 Section 9.2.4).	Pressure driven emission factor indicates 5% efficiency loss.
Monthly Assessment	25% of pressure data above 0.5"WC (CARB CP-201 Section 9.2.4).	Eliminate monthly ISD alarm criteria.
Daily Assessment (Processors Only)	Daily assessment to identify vapor processor malfunction (CARB CP-201 Section 9.2.5).	Daily assessment to identify vapor processor malfunction. Include requirement that UST pressure may not be the sole indicator of processor performance.

Proposed Alarm Criteria



Comparison of Proposal and Existing ISD Performance Standards

Period	# of Weeks of Data	# of OP Alarms if 5% of the weekly pressure data exceeds 1.3"WC	# of OP Alarms if the weekly Emission Factor exceeds 0.48 lbs/kgal in Winter and 0.38 lbs/kgal in Summer	% Decrease in OP Alarms	% of OP Alarms with Equipment Problem when EF exceeds 0.48 lbs/kgal in Winter and 0.38 lbs/kgal in Summer
Winter (Nov 09 - Mar 10) - 6 Sites	112	31	3	90.3%	33%
Winter (Nov 10 - Mar 11) - 6 Sites	118	43	8	81.4%	100%
Winter (Nov 11 - Mar 12) - 6 Sites	129	33	4	87.9%	100%
Summer (Apr 10 - Oct 10) - 6 Sites	168	5	0	100.0%	N/A
Summer (Apr 11 - Oct 11) - 6 Sites	173	16	2	87.5%	100%
Overall - 6 Sites (Nov 09 - Mar 12)	700	128	17	86.7%	88%

*2 out of 3 alarms during Nov 09 – Mar 10 were due to extended 36 hour holiday shutdown.

Implementation of Proposal

- Existing ISD Installations – Optional to upgrade to new emission based ISD software.
- New ISD Installations – Required to install new emission based ISD software.
- After new emission based software is available, Advisory 405-B will be rescinded and all OP alarms will require a contractor response.

Estimated Costs

- Upgrade includes:
  - ISD Software and Installation
  - PV Valve and Installation
  - CUPA Permit Fees
- Estimated Costs Range from $2000 - $4000.

ARB Contact Information

- John Marconi
  Vapor Recovery In-Use Section
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  jmarconi@arb.ca.gov
- Gurj Bains
  Testing and Certification Section
  916-445-9170
  gbains@arb.ca.gov

Matt Rodriguez
Secretary for Environmental Protection

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Edmund G. Brown Jr.
Governor

April 8, 2013

To All Vapor Recovery Stakeholders:

Dear Sir or Madam:

The California Air Resources Board (ARB) staff is holding a public workshop to discuss a draft regulatory proposal for amendments to the Enhanced Vapor Recovery (EVR) certification and test procedures for gasoline dispensing facilities (GDFs).

The time and place for the workshop are as follows:

DATE: Tuesday, April 23, 2013
TIME: 2:00 p.m. to 4:00 p.m. PDT.
PLACE: Cal/EPA Headquarters
Sierra Hearing Room, 2nd Floor
1001 I Street
Sacramento, CA 95814

TELECONFERENCE: To listen in, call 888-566-5785 at the workshop start time.
Enter passcode 1751063 when prompted.

This workshop will cover the following proposals, which are intended to promote statewide consistency and address technical issues with certain existing test procedures used during vapor recovery equipment certification:

- Revise the test procedure used to determine emission factor for standing loss control for aboveground storage tanks.
- Revise the test procedure used to determine volumetric efficiency for Phase I EVR systems used on aboveground storage tanks.
- Propose standards for conventional nozzles used at GDFs serving fleets of vehicles equipped with onboard refueling vapor recovery (ORVR) systems.
- Codify existing procedure for certifying and testing field delivery tanks (cargo tanks).
- Propose minor administrative and editorial changes to vapor recovery Certification Procedures, Test Procedures, and Definitions.

The workshop will consist of a presentation by staff on the proposed regulation, followed by a question and answer period. Copies of the draft regulatory language and supporting documents, and workshop agenda will be posted on the 2013 EVR Rulemaking web page at http://www.arb.ca.gov/vapor/rulemaking.htm by April 15, 2013.

The workshop location is accessible to persons with disabilities. If you have special accommodation or language needs, please contact Carolina Zavala at (916) 327-0900 as soon as possible. TTY/TDD Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

If you cannot attend the workshop and have technical questions regarding the content that will be discussed, please contact Scott Bacon at (916) 322-8949 or via email at sbacon@arb.ca.gov. If you have difficulties in accessing the conference call on the day of the workshop, please call (916) 327-0900.

Sincerely,

George Lew

George Lew, Chief
Engineering and Certification Branch
Monitoring and Laboratory Division

California Environmental Protection Agency
Air Resources Board

Workshop For 2013 Vapor Recovery Rulemaking

Enhanced Vapor Recovery (EVR)
and
Gasoline Cargo Tanks

April 23, 2013 - Sacramento

Presentation Outline

1. Purpose / Context of Today's Workshop
2. 2013 EVR Regulatory Proposal
   - Enhanced Conventional (ECO) Nozzles for On-Board Refueling Vapor Recovery (ORVR) Fleet Fueling Facilities
   - Aboveground Storage Tank (AST) Certification Test Procedures
   - Cargo Tank Certification
3. Questions, Contact Information

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Purpose of Workshop

- Inform interested parties about proposed changes to vapor recovery program
- Solicit feedback on proposed changes
- Our Goal: Identify and resolve any issues before we present these amendments to our Board for adoption
- Board Hearing scheduled for July 2013

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Public Participation

Public Workshops Oct/Nov 2012, April 2013	Rulemaking 45-day Comment Period June 10 – July 25, 2013	Board Hearing July 25, 2013
Informal Process Present concepts and draft regulatory language Solicit and consider stakeholder feedback on concepts and draft language	**Formal Process** Staff publishes the proposed regulatory change and provides reasons including costs and impact Public may submit written or oral comments on staff's proposal to Board	**Final Stage** Staff formally presents proposal to Board After considering all comments, Board accepts proposal, directs staff to address any remaining issues, or rejects proposal

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Vapor Recovery Program

- Vapor recovery program has been in place for over 35 years in California
- Staff is focused on improving the vapor recovery program by:
  1. Reducing operation and maintenance costs
  2. Implementing technical improvements
  3. Reducing emissions where practical and cost-effective

Oct / Nov 2012 Workshops

- Short-term, mid-term, and long-term concepts for program improvement were presented.
- Some of the short-term measures are already being implemented:
  - ARB staff audit of manufacturer training
  - Mix & match of balance EVR components
  - Informational Bulletin issued regarding removal of In-Station Diagnostics (ISD) on stations under 600,000 gal. annual throughput
  - Online vapor recovery equipment complaint form

The Next Steps...

- Mid-term items are in today's proposal
- Long-term items in late 2014 will include:
  - ISD overpressure alarm solution
    - Staff is revising proposal based on new data
    - Advisory 405-B remains in place
  - ISD software enhancements that will improve diagnostic capability and streamline or reduce compliance testing
  - Field test procedure improvements

2013 VAPOR RECOVERY REGULATORY PROPOSAL

2013 Regulatory Proposal

- Enhanced Vapor Recovery (EVR) Proposal
  - Adopt new standards for ECO Nozzles to be used at ORVR Fleet Fueling Facilities
  - Revise TP 201.1, Volumetric Efficiency of Phase I EVR
  - Revise TP 206.2, Emission Factor of Standing Loss Control Systems with Processors for ASTs
- Cargo Tank Proposal
  - Revise Cargo Tank Certification and Test Procedures

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Enhanced Conventional Nozzles (ECO Nozzles)

For Use at On-Board Refueling Vapor Recovery (ORVR) Fleet Fueling Facilities

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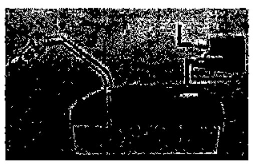
ORVR / Phase II Background

Two Control Systems Targeting the Same Emission Source: vapor displaced during vehicle fueling

1. Phase II Vapor Recovery: gasoline dispensing facility (GDF) based, vapor returned to storage tank, uses coaxial nozzles and hoses, vapor return piping
2. Onboard Refueling Vapor Recovery (ORVR): vehicle based, vapor is captured in a carbon canister on the vehicle and later burned, no vapor for Phase II system to recover, federal requirement for vehicles after 1998



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ORVR Fleet Facilities

- Many Air Districts allow ORVR fleet GDFs to operate without Phase II Vapor Recovery
  - 2/20/2008 Letter from ARB to Air Districts
  - Consistent with U.S. EPA Memo
- Requires a fleet of 90% to 100% ORVR vehicles, depending on the district rule
- Applicable to non-retail facilities only
  - Car rental, government, or corporate fleets

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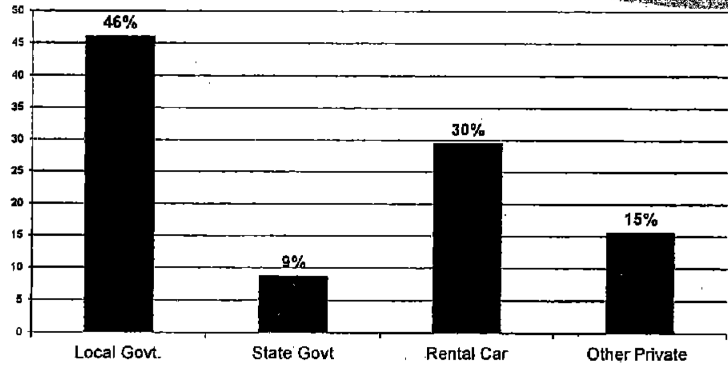
ORVR Fleet Facility Ownership

Ownership Percentage
Based on data Provided by South Coast AQMD



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13

ECO Nozzles

- Since these facilities are exempt from Phase II Enhanced Vapor Recovery (EVR), what standards apply?
  - Conventional nozzle (no vapor return path)
  - Phase II EVR nozzle with vapor path capped
- New standards would provide statewide consistency, emission reductions, and cost savings

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ECO Nozzle Standards

Performance Type	Requirement	Test Procedure
Nozzle Spillage	≤ 0.24 pounds/1,000 gallons	TP-201.2C
Post-Refueling Drips	≤ 3 Drops per Refueling	TP-201.2D
Liquid Retention	≤ 100 mL per 1,000 gallons	TP-201.2E
Nozzle Spitting	≤ 1.0 mL / nozzle / fueling	TP-201.2E

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Comparison of Nozzle Controls

Vehicle Type \ Nozzle Type	Phase II EVR Nozzle	Conventional Nozzle	ECO Nozzle
ORVR	Liquid and Vapor Controls	Vapor Controls	Liquid and Vapor Controls
Non-ORVR	Liquid and Vapor Controls	[illegible]	Liquid Controls

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ECO Nozzle

- Incorporates relevant Phase II EVR standards and specifications for liquid
- Insertion interlock is required to meet spitting standard
- New nozzle will cost more than current conventional nozzle but less than EVR nozzle

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Current ORVR Fleet Fueling Data

- 322 Facilities Statewide
  - 145 using EVR nozzles and hardware
  - 177 using uncertified conventional nozzles and hardware
- Average of 3 nozzles per facility
  - 435 EVR, 531 Conventional, 966 Total
- Average facility throughput of 19,500 gallons per month

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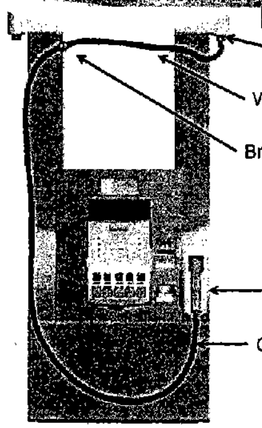
Upgrading to ECO Nozzles

- "Effective Date" would be the day the first ECO Nozzle is certified by ARB
- State Law allows existing equipment to remain in use for four years from the effective date.



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ECO Nozzle Costs

Cost of Conversion: Phase II EVR to ECO Nozzle

Component	Phase II EVR Cost	ECO Nozzle Cost	Difference
Adaptor	N/A	$ 21	$ 21
Whip Hose	$ 71	$ 30	$ -41
Breakaway	$ 117	$ 65	$ -52
Curb Hose	$ 172	$ 84	$ -88
Swivel	N/A	$ 29	$ 29
Nozzle	$ 439	$ 305	$ -134
Total	$ 799	$ 534	$ -265

Cost of Conversion: Uncertified Conventional to ECO Nozzle

Component	Uncertified Conventional Cost	ECO Nozzle Cost	Difference
Nozzle	$ 62	$ 305	$ 243
Total	$ 62	$ 305	$ 243

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Emission Reductions from ECO Nozzle Proposal

- Spillage reduced from 0.61 to 0.24 pounds/1000 gallons dispensed
  - Applies only to the conventional nozzles that will be upgraded to ECO Nozzles
- Spillage reduced by ~15,400 pounds per year
  - Approximately 2,500 gallons (or $9,500) of fuel

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21

Total Statewide Cost of ECO Nozzle Proposal

- Cost of Upgrading Conventional to ECO Nozzles = $32,000 / year
- Savings from Replacing EVR with ECO Nozzles = $29,000 / year
- Value of Fuel Saved from Reduced Spillage = $9,500 / year
- Total: $32,000 - $29,000 - $9,500 =

  Statewide Savings of ~$6,500 / year

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22

Cost Effectiveness of ECO Nozzle Proposal

- Considering only the facilities upgrading from conventional to ECO Nozzles:

  $1.48 per pound reduction
- Statewide total, taking into account the savings from facilities replacing EVR equipment with ECO Nozzle equipment:

  $-0.39 per pound reduction

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23

REVISE AST CERTIFICATION TEST PROCEDURES

TP-201.1: PHASE I VOLUMETRIC EFFICIENCY

TP-206.2: STANDING LOSS CONTROL (SLC) EMISSION FACTOR

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24

TP-201.1 Amendments

- Phase I EVR systems must achieve a volumetric (fuel transfer) efficiency of ≥ 98%
- Existing Phase I Volumetric Efficiency Test Procedure TP-201.1 was originally developed for UST applications in 1996
- When ARB adopted EVR for AST in 2008, TP-201.1 was incorporated for AST certification
- TP-201.1 not well suited for AST's due to pressure driven vent line emissions which may occur during idle periods

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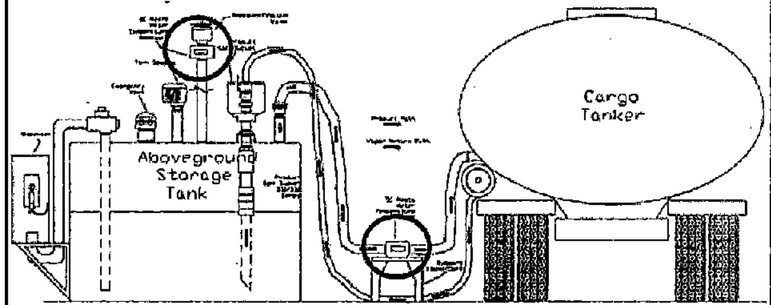
TP-201.1 Amendments
Background

Phase I Efficiency Equation: $E = (100) [(V_{returned} - V_{vent}) / (V_{returned})]$



California Environmental Protection Agency
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26

TP-201.1 Amendments
Description of Problem

- Pressure driven vent line emissions commonly occur in single wall AST due to ambient temp increase & fuel evaporation
  - ARB data shows an average vent line flow rate of ~1 cfh
- Vent line flow rate not due to design of Phase I system, yet included in efficiency equation

California Environmental Protection Agency
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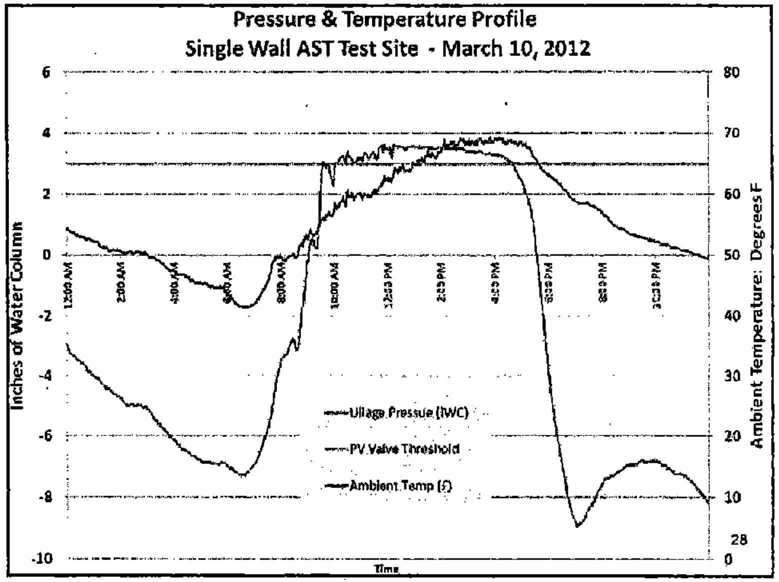
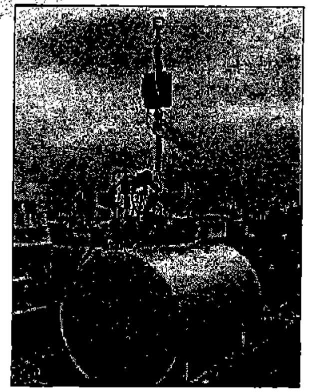
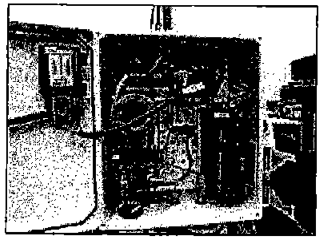
27



TP-201.1 Amendments
Method Development Test Site



Parameters Measured:
- Vent Line Flow Rate (cubic feet)
- Ullage Pressure (Inches WC)
- Ambient Temperature (°F)
- Atmospheric Pressure (Inches Hg)
- Via Cell Phone Modem



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TP-201.1 Proposed Changes

- For ASTs, remove the post fuel delivery waiting period on vent line emissions
- For ASTs, only measure vent volume emissions during the delivery
- Figures and language updated for ASTs

California Environmental Protection Agency
Air Resources Board

TP-206.2 Amendments
Background

- TP-206.2 is used by ARB staff during certification testing to measure the emission factor of AST Standing Loss Control (SLC) systems that use a vapor processor
  - Measures mass emitted during periods of no deliveries or dispensing (diurnal emissions)
  - Result is reported as mass emitted per 1000 gallons of tank ullage space
  - Based on TP-201.2, emission factor test for Phase II EVR systems on underground tanks

California Environmental Protection Agency
Air Resources Board

TP-206.2 Amendments

- TP-201.2 was amended in 2012 to:
  - Accommodate modern sampling equipment
  - Allow staff some flexibility when configuring test equipment in the field
  - Provide instructions for sampling of processor inlet and outlet streams when appropriate
  - Update instrument calibration requirements
- Todays proposal would make similar changes to TP-206.2

California Environmental Protection Agency
Air Resources Board

TP-206.2 Amendments

- Proposed changes will not alter the performance standard for SLC
- No significant changes in cost or time required for completing testing per TP-206.2
- No SLC system with vapor processor has been submitted to ARB for evaluation
- TP-206.2 is used by ARB staff, so changes should not impact the public

AMENDMENTS TO GASOLINE CARGO TANK VAPOR RECOVERY PROGRAM

Cargo Tank Vapor Recovery Program Amendments

- **CP-204** - *Certification Procedure for Vapor Recovery Systems of Cargo Tanks*
  - ***TP-204.1*** - *Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks*
  - ***TP-204.2*** - *Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks*
  - ***TP-204.3*** - *Determination of Leak(s)*

What's Changing?

1. Administrative changes
2. Streamlining the program regarding new components and/or systems
3. Harmonizing the California and Federal requirements for leak decay testing

New Components

1. Must meet the specifications of G-70-10-A, Exhibit II
2. Must meet annual leak rate criteria per CP-204

California and Federal Requirements

- Different test methods required
  - California = TP-204.1
  - Federal = EPA Method 27
- Different Test Timelines

Acceptable Test Methods

Currently Required	Proposed
TP-204.1	TP-204.1, or EPA Method 27 with exceptions

EPA Method 27 with 3 exceptions

1. Must meet all "degassing" or vapor purging restrictions of CP-204
2. Must meet Leak Rate Criteria in CP-204
3. Pressure, Vacuum, and Internal Vapor Valve Tests passed consecutively

Test Timelines

California vs. Federal Test Windows

Program	Current	Proposed
California	60 days prior to expiration	30 days prior to expiration
Federal	30 days prior to expiration	30 days prior to expiration

TP-204.3 Vapor or Liquid leaks

Sniffer test and liquid leak standards during loading operations

- Maintains EPA Method 21 as equivalent with the exception of a probe distance of 2.5cm (approximately 1 inch)

Benefits of Amendments

- Eliminates the certification process for new components
- Harmonizes ARB and Federal Dept. of Transportation (DOT) testing requirements

QUESTIONS AND COMMENTS

Contact Information

	Staff	Contact Info
Enhanced Vapor Recovery Amendments	Scott Bacon	(916) 322-8949 sbacon@arb.ca.gov
Cargo Tank Amendments	Brad Cole	(916) 322-3951 bcole@arb.ca.gov

http://www.arb.ca.gov/vapor/rulemaking.htm

TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER THE ADOPTION OF THE REGULATORY PROPOSAL TO DETERMINE AND CONTROL EVAPORATIVE EMISSIONS FROM OFF-HIGHWAY RECREATIONAL VEHICLES

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider the adoption of new test procedures to measure evaporative emissions from off-highway recreational vehicles (OHRV) and expand evaporative emission control requirements (title 13, California Code of Regulations, section 2416 et seq.) including certification, labeling, enforcement, anti-tampering, recall, and use restrictions.

DATE:	July 25, 2013
TIME:	9:00 a.m.
PLACE:	California Environmental Protection Agency Air Resources Board Byron Sher Auditorium 1001 I Street Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., July 25, 2013, and may continue at 8:30 a.m., on July 26, 2013. This item may not be considered until July 26, 2013. Please consult the agenda for the hearing, which will be available at least 10 days before July 25, 2013, to determine the day on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW PURSUANT TO GOVERNMENT CODE 11346.5(a)(3)

Sections Affected: Proposed adoption to California Code of Regulations (CCR), title 13, section(s) 2416, 2417, 2418, 2419.1, 2419.2, 2419.3, 2419.4 and 2419.5. TP-933 "Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles," is proposed for adoption and is incorporated by reference in CCR, title 13, sections 2417, 2418, and 2419.5.

Documents Incorporated by Reference:

The following documents are incorporated by reference in the California Code of Regulations, title 13, Article 3, Off-Highway Recreational Vehicles and Engines as specified by section:

1. *13331:1995(E)*, Figure 1, International Standards Organization. 1 June 1995, section 2418;

2. *Control of Evaporative Emissions from New and In-use Nonroad and Stationary Equipment.* Title 40 Code of Federal Regulations, Part 1060.520. United States Environmental Protection Agency, as amended on April 30, 2010, section 2418
3. *Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations and Acronyms*, J1930, Society of Automotive Engineers, October 2008, section 2419.1;
4. *Emissions Warranty Parts List.* Air Resources Board, February 22, 1985 edition, section 2419.2;
5. Pannikottu, A. and Centea, M., "Test Procedure to Determine the Hydrocarbon Losses from Fuel Tubes, Hoses, Fittings, and Fuel Line Assemblies by Recirculation," SAE Technical Paper, November 2004 Edition, section 2418;
6. *Test Procedure for Determining Diurnal Evaporative Emissions from Small Off-Road Engine, TP-902,* California Environmental Protection Agency, Air Resources Board, Sacramento, CA, July 26, 2004, section 2417;

The following documents are incorporated by reference in the proposed TP-933:

1. *California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles*, California Environmental Protection Agency, Air Resources Board, El Monte, CA, March 22, 2012.
2. *California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,* California Environmental Protection Agency, Air Resources Board, El Monte, CA, March 22, 2012;
3. *California Exhaust Emissions Standards and Test Procedures For 1997 and Later Off-Highway Recreational Vehicles and Engines,* California Environmental Protection Agency, Air Resources Board, El Monte, CA, August 15, 2007;
4. *Control of Emissions from New and In-Use Highway Vehicles and Engines.* Title 40, Code of Federal Regulations, Part 86. United States Environmental Protection Agency, Subpart 107-96, 108-79, 108-00, and 508-78;
5. Reddy, S. Raguma. *Prediction of Fuel Vapor Generation From a Vehicle Fuel Tank as a Function of Fuel RVP and Temperature.* SAE Technical Paper 892089, September 25-29,1989. Copyrighted;
6. *Test Procedure for Determining Permeation Emissions from Small Off-Road Engine Equipment Fuel Tanks,* TP-901, California Environmental Protection Agency, Air Resources Board, Sacramento, CA, July 26, 2004;

Background and Effect of the Proposed Rulemaking:

In spite of a significant reduction in ozone precursors, California needs additional reductions of reactive organic gases (ROG) to achieve attainment of the ozone standard in all areas of the State. Mobile sources have historically been the largest source of ROG emissions in California. As on-road mobile sources have become progressively cleaner, the role of off-road sources, as well as mobile sources under federal and international jurisdiction (e.g., ships, locomotives, and aircraft) has become more prominent. One of the largest sources of ROG is OHRVs, which includes all-terrain vehicles, off-road motorcycles, and specialty off-highway vehicles.

In 2006, ARB harmonized with the United States Environmental Protection Agency (U.S. EPA) fuel tank and hose permeation standards as part of the OHRV exhaust emissions control regulation. These permeation standards only control a small fraction of evaporative emissions from the over one million OHRVs operating statewide. To attain the 8-hour federal ambient air quality standard for ozone, which is both more challenging and more protective of public health than the previous standard, it is necessary to incorporate expanded off-road mobile source emissions control into California's State Strategy.

2007 Amendments to the State Implementation Plan

In September 2007, the Board adopted Amendments to the SIP, which comprises State and local air quality planning documents showing how and when California will meet ambient air quality standards (AAQS). The 2007 State Strategy articulated by the 2007 SIP Amendments is the first to address the federal 8-hour AAQS for ozone (0.08 parts per million (ppm)) as well as the 24-hour and annual standards for fine particles ($PM_{2.5}$) (65 micrograms per cubic meter ($\mu g/m^{3}$) and 15 $\mu g/m^3$, respectively). These federal AAQS were originated by U.S. EPA in 1997 in response to scientific studies substantiating adverse health effects at lower levels than had previously been resolved. Due in part to litigation, as well as the extensive process required to establish area designations and boundaries, the 8-hour ozone standard was not finalized until 2004.

The 8-hour ozone standard is more stringent than the previous 1-hour standard and calls for more extensive emissions control strategies. Although California has already significantly reduced ambient ozone concentrations, the challenges posed by the more stringent standard provoked the reclassification of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast Air Quality Management District (SCAQMD) nonattainment designations as "extreme" with regard to the 8-hour standard. "Extreme" nonattainment status allows for reliance on development of new technologies or improvement of existing technologies (Section 182(e)(5) of the Clean Air Act (CAA); 42 U.S.C § 7511(e)(5)). in addition to other enforceable commitments to reduce emissions of ozone precursors, namely oxides of nitrogen (NO_X) and reactive organic gases (ROG).

Proposed new SIP measures in the 2007 State Strategy include expanded evaporative emissions standards from OHRVs. These expanded OHRV evaporative emissions standards are projected to deliver necessary ROG emissions reductions statewide by 2023, including in California's most challenging regions with regard to ozone control, namely the SJVACPD and the SCAQMD.

When the Board originally adopted the 2007 Amendments to the SIP, the Board was expected to take action on expanded evaporative emissions from OHRV by 2010, with implementation beginning in the 2012-2015 timeframe. However, the rulemaking was delayed so that the emissions inventory could be updated. The creation of a new emissions inventory required staff to update emissions factors, perform usage surveys, and modify the fundamental assumptions associated with the inventory.

Control of evaporative emissions from OHRVs will help to reduce ozone levels in non-attainment areas throughout California, and especially in the SJVAPCD and SCAQMD. This regulatory proposal is a key element in the State Strategy for demonstrating attainment with the 8-hour ozone federal air quality standard.

Description of the Proposed Regulatory Action, Objectives, and Benefits:

Subarticle 1. Proposed Regulatory Action

The purpose of the Regulatory Proposal to Determine and Control Evaporative Emissions From Off-Highway Recreational Vehicles is to: (1) expand the federal OHRV evaporative emission standards to include stringent evaporative emission standards representative of vehicle usage modes, (2) separate exhaust and evaporative emission standards, (3) include provisions for certification, labeling requirements, enforcement, recall, and use restrictions, (4) introduce a new test procedure to determine evaporative emissions from OHRVs, and (5) establish OHRV durability requirements for evaporative components. To achieve these goals, the adoption of the OHRV evaporative emissions control regulation and test procedure is being proposed. The proposed regulatory action was developed in close collaboration with industry to ensure that the proposal achieves cost-effective emission reductions without creating an unnecessary burden on industry. Since early 2006, four public workshops and nearly forty stakeholder meetings have been held on all aspects of this regulatory proposal and supporting data collection.

Stringent Evaporative Emission Standards. This rulemaking proposes comprehensive control of evaporative emissions from OHRVs. Specifically, the proposed rulemaking sets performance standards for diurnal emissions. Industry stakeholders proposed the stringent 1 g total organic gas (TOG)/day diurnal standard, which is very effective at controlling emissions and is supported by emissions testing data. The standards reflect an emphasis on diurnal emissions control for two reasons. First, OHRV activity patterns include large periods of time when these vehicles are not operated, such that diurnal emissions contribute more than running loss and hot soak emissions. Secondly, the locations of diurnal emissions are concentrated where vehicles are stored, in contrast to hot soak and running loss emissions, which occur where these vehicles are operated. Since OHRVs registered in California tend to be stored in urban areas with greater air pollution control issues than the rural areas where they are typically operated, diurnal emissions control is even more critical. The diurnal processes account for by far the largest fraction (82 percent) of evaporative emissions from currently operated OHRV in California. This is due largely to the relatively low usage and long storage periods for this type of equipment.

Independent Performance Standards for Evaporative and Exhaust Emissions. The proposed evaporative performance standards are handled separately from the current, primarily exhaust-oriented, OHRV emissions regulation. The benefit of separate regulations is that OHRVs that currently do not meet exhaust standards and are issued a red registration sticker will be required to meet evaporative standards, therefore providing a substantial reduction in ROG emissions from this class of vehicles. Furthermore, this rulemaking is written to avoid any duplicative requirements between the current exhaust and proposed evaporative emissions regulations in labeling, testing, and certification.

Flexibility for Certification. This proposal accommodates diversity in vehicle type and testing capabilities within the regulated community by offering multiple certification options. Manufacturers that produce less than 50 OHRVs per model year, for three consecutive model years, are eligible to certify to the small volume evaporative emission design-based standard that does not require a whole-vehicle SHED test. The use of advanced fuel system technology is encouraged by allowing manufacturers to generate emissions credits from certification using diurnal test results that are lower than performance standards, or zero-emission vehicles. OHRV manufacturers may use earned credits to produce evaporative families above the proposed evaporative emissions standards; however, no single evaporative family may exceed three times the emissions standard. The credit system encourages manufacturers to produce more zero-emission vehicles, thus increasing technology availability.

Incorporation of New Test Procedure. A new test procedure, *Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles (TP-933)* (Attachment B to Initial Statement of Reasons (ISOR)), is incorporated into the regulatory proposal to determine OHRV evaporative emissions. TP-933 is the result of years of collaboration between ARB and industry to develop a testing sequence that mimics emissions that occur during real-world use.

Durability Requirements to Ensure In-Use Control. Both the proposed test procedure and regulation emphasize verifying the durability of control technology. The test procedure subjects the vehicle to conditions that mimic what the components would endure throughout the useful life of the OHRV. These conditions include exposure to vibration, dust, and ultraviolet radiation. The proposed regulatory provisions include a warranty period of 30 months for components with replacement costs under $200 (including labor) and 60 months for more expensive components. Following the precedent set by regulations in the light-duty motor vehicle sector, replacement costs are established based on dealers' list prices as well as standard labor price and time limits for warrantied components. Further durability provisions include the requirement that vehicles have tamper-resistant emission control components, and careful placement to help reduce emission control component tampering by the end user.

Subarticle 2. Benefits of the Proposed Regulatory Action

The proposed regulatory action is developed to provide numerous emission reduction benefits well into the future. Staff expects a 70 percent reduction in evaporative emissions from new OHRVs compared to existing vehicles. The test procedure requirements will ensure proper vehicle design for effective control over the expected life of OHRVs. Additionally, the introduction of OHRV advanced fuel system credits will encourage the expansion of zero-emission vehicle technology into the off-road sector to achieve additional future emission reductions.

The expected emission reductions associated with the proposed regulation will result in indirect benefits to the health and welfare of California residents, worker safety, and the state's environment.

Health and Welfare of California Residents. The proposed amendments would curtail ROG emissions released into the atmosphere, resulting in improved air quality that will help California meet the federal 8-hour air quality standard for ozone. Additionally, the proposed amendments would result in reduced exposure to benzene, a toxic air contaminant. Due to reduced fuel consumption as well as ROG emissions reductions, climate co-benefits are also anticipated.

Worker Safety. Based on experience with the same technology for on-road vehicles, the technology that manufacturers are likely to use has been demonstrated to be safe. In general, control technology will make vehicles safer by reducing gasoline vapors and liquid leaks from OHRVs, which can cause fires.

State's Environment. Based on ARB's review of the proposed amendments, staff concludes that the amendments would not have a significant adverse impact on the environment. Compliance with the proposed amendments would not result in any physical change to the existing environment. The proposed amendments will reduce evaporative emissions from OHRVs by setting emission standards that are easily met by incorporating currently available technologies during construction. Thus, the amendments would not involve or result in any physical changes to the existing environment, such as new development, modifications to existing buildings or facilities, or new land use designations. ARB staff finds that it is not reasonably foreseeable that there will be any adverse impacts on aesthetics, air quality, agricultural and forestry resources, biological resources, cultural resources, geology and soils, greenhouse gases, hazardous materials, hydrology and water quality, land use planning, mineral resources, noise, population and housing, public services, recreation, or traffic and transportation. This regulatory proposal would not require any action by regulated parties that could affect these resources.

No discussion of alternatives or mitigation measures to address significant adverse environmental impacts is necessary because no significant adverse environmental impacts would result from implementation of the proposed amendments. This is because the proposed amendments merely propose emission standards to reduce running loss, hot soak and diurnal emissions from OHRVs, which would be easily accomplished by using already existing technologies.

CONSISTENCY AND COMPATIBILITY WITH EXISTING STATE REGULATIONS

Staff does not believe this regulatory proposal is inconsistent or incompatible with existing state regulations. As mentioned previously, the federal OHRV evaporative emission standards is incorporated into the existing ARB exhaust emission standard, specified in Cal. Code Regs., tit.13,§ 2412. The existing evaporative emission standards that reside in the exhaust regulation shall not need amendment, as it is presumed that all vehicles that meet the stringent 1 g TOG/day diurnal standard have demonstrated compliance with the federal permeation standards.

COMPARABLE FEDERAL REGULATIONS

In 2002, the U.S. EPA promulgated the first evaporative emissions standards to control permeation losses from OHRV fuel tanks and hoses (*Control of Evaporative Emissions from New and In-Use Non-Road and Stationary Equipment; Final Rule* 40 FCR Part 1060. April 30, 2010). ARB harmonized with these standards in 2006, by amending the OHRV exhaust regulation to include evaporative emission standards. The proposed regulatory action expands the control of evaporative emissions to include all vehicle modes. A variety of technologies are available to help manufacturers meet the proposed emission standards. This regulatory proposal anticipates that manufacturers will use downsized and proven on-road automobile technology for control of OHRV evaporative emissions.

STATE IMPLEMENTATION PLAN REVISION

If adopted by ARB, ARB plans to submit the proposed regulatory action to the U.S. EPA for approval as a revision to the California SIP required by the CAA. The adopted regulatory action would be submitted as a SIP revision because it adopts regulations intended to reduce emissions of air pollutants in order to attain and maintain the National Ambient Air Quality Standards promulgated by U.S. EPA pursuant to the CAA.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: "Staff Report: Initial Statement of Reasons for Rulemaking: Adoption of Evaporative Emission Control Requirements for Off-Highway Recreational Vehicles."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, on June 5, 2013.

Final Statement of Reasons Availability

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on ARB's website listed below.

Agency Contact Persons

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Jim Watson, Manager of Evaporative Control, Engineering, and Regulatory Development Section, Monitoring and Laboratory Division at (916) 327-1282, or Pippin Mader, Air Resources Engineer, at (916) 322-8930.

Further, the agency representative and designated back-up contact persons, to whom nonsubstantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

Internet Access

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on ARB's website for this rulemaking at http://www.arb.ca.gov/regact/2013/ohrv2013/ohrv2013.htm

DISCLOSURES REGARDING THE PROPOSED REGULATION

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Fiscal Impact / Local Mandate

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action would not create costs or savings to any State agency or in federal funding to the State, costs or mandate to any local agency or school district, whether or not reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESS, INCLUDING ABILITY TO COMPETE

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons. Because all major OHRV manufacturing facilities affected by the proposed regulation are located outside of California, there will only be a small indirect impact, although not significant, on small businesses that buy and sell OHRVs. During the initial years of implementation, the increased cost of OHRVs may lead to a slight drop in demand that could result in lower profits. The retailer would carry unsold stock over to the next year, possibly incurring less profit on the sale of these units. However, these impacts have been mitigated by the flexible phase-in schedule of emission controls, the ability for manufacturers to certify vehicles with credits, and an implementation year that coincides with a steady increase in projected vehicle sales. There will be no noticeable change in employment, business creation, elimination or expansion, or business competitiveness in California due to the proposed regulatory action.

COST IMPACTS ON REPRESENTATIVE PRIVATE PERSONS OR BUSINESSES

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The ARB is not aware of any significant cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. The cost of implementation is expected to be passed down to the consumer and is estimated to result in a 4 to 9 percent cost increase per OHRV (based on an average retail cost of $5,000 per vehicle). A retail price increase would be less noticeable for OHRVs that can more readily absorb fixed cost increases, such as vehicles with high sales volumes or higher price. Consumers who purchase OHRVs with fuel injection systems will also see increased fuel cost savings. The end user will save an average of $53 in fuel costs over the life of the vehicle (OHRVs have an average life of 21 years) as a result of reduced evaporative emissions. There may be fewer options in a particular OHRV segment, but there is expected to be at least one OHRV model available for sale in each significant segment. Segments that are very specialized can be filled with OHRVs certified to meet the small volume manufacturer design standard.

STATEMENT OF THE RESULTS OF THE ECONOMIC IMPACT ASSESSMENT PREPARED PURSUANT TO GOVERNMENT CODE SEC. 11346.3(b)

Effect on Jobs/Businesses:

The Executive Officer has determined that the proposed regulatory action would not significantly affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

Benefits of the Proposed Regulation:

A detailed assessment of the economic impacts of the proposed regulatory action can be found in the Economic Impact Analysis in the ISOR. Also, see page 5 of the notice under "Subarticle 2. Benefits of the Proposed Regulatory Action."

EFFECT ON SMALL BUSINESS

The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action would directly affect small businesses. California's small business population consists of a trace quantity of small volume spark ignition sand car manufacturers. These manufacturers already purchase ARB compliant engines and fuel management packages, and if promulgated, staff anticipates that they will also purchase ARB certified fuel storage systems in order to comply with the proposed evaporative emission standards. Given their low annual production volumes, California's sand car manufacturers are expected to certify vehicles using the small volume OHRV manufacturer design-based standard; Eligibility for design-based certification is exclusive to manufacturers that produce 50 OHRVs or less per model year. As such, the typical small business in California will not find it necessary to assume costs associated with certification and redesign as long as they continue to purchase ARB certified components. Record keeping and incremental component costs are estimated to be the only impacts to small business. However, when expressed on a per vehicle basis these cost impacts will be virtually indistinguishable within the overall price of a typical sand car.

The several small zero-emission OHRV manufacturing facilities that exist in California may benefit from an increase in demand and market availability. Some small businesses outside of California may be indirectly affected by the regulatory action, as they may decide to discontinue producing vehicles for the California market due to cost increases, which would result in a decrease in model availability.

HOUSING COSTS

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

BUSINESS REPORT

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the regulation which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California. Reporting requirements are necessary to ensure manufacturer compliance with the proposed standard. Additionally, reporting requirements allow manufacturers to certify vehicles using advanced fuel system credits, which will help reduce the cost of compliance, and encourage the production of zero-emission vehicles.

ALTERNATIVES

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, or would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law. Alternatives to the proposed rulemaking are described in Chapter VIII of the ISOR.

ENVIRONMENTAL ANALYSIS

In accordance with ARB's certified regulatory program, California Code of Regulations, title 17, sections 60006 through 60007, and the California Environmental Quality Act, Public Resources Code section 21080.5, ARB has conducted an analysis of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulatory action. The environmental analysis of the proposed regulatory action can be found in Chapter VI of the ISOR.

WRITTEN COMMENT PERIOD AND SUBMITTAL OF COMMENTS

Interested members of the public may present comments orally or in writing at the meeting and may provide comments by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on June 10, 2013. To be considered by the Board, written comments not physically submitted at the meeting, must be submitted on or after June 10, 2013 and received **no later than 12:00 noon on July 24, 2013**, and must be addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the hearing so that ARB staff and Board members have additional time to consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: May 28, 2013

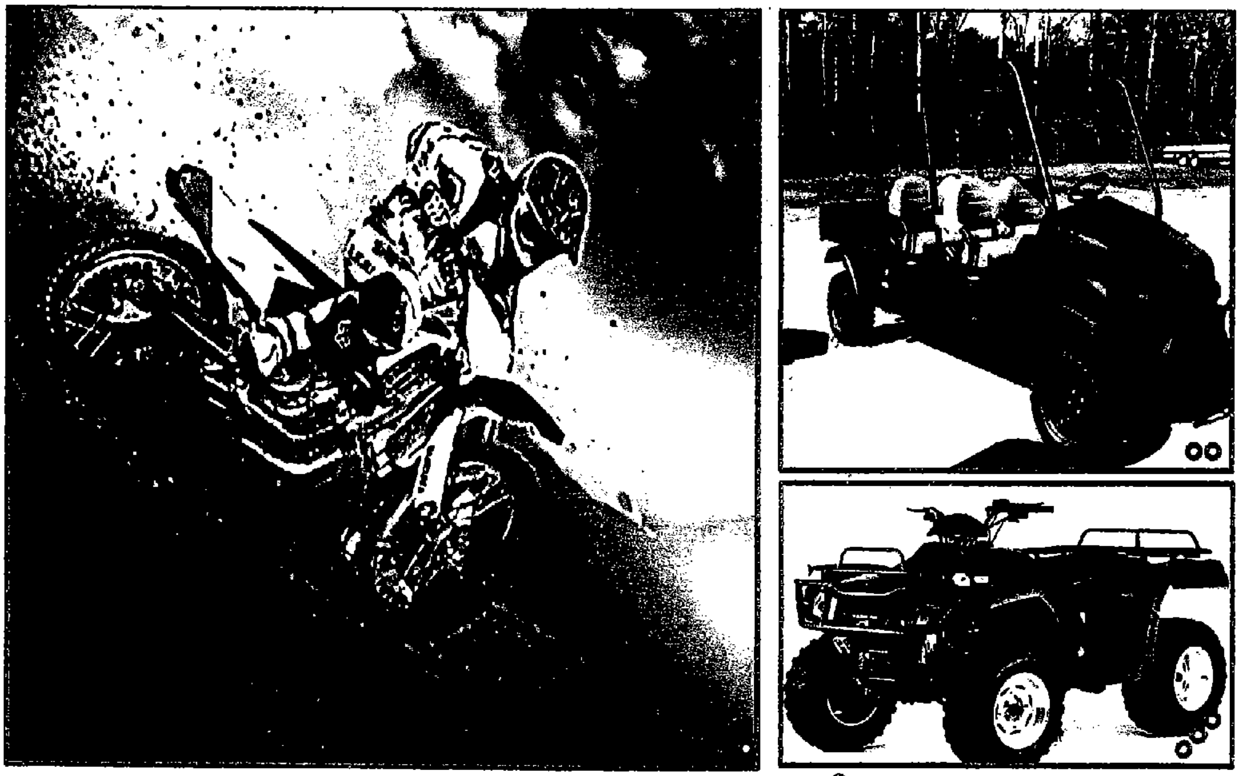
The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.

California Environmental Protection Agency

Air Resources Board

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

ADOPTION OF EVAPORATIVE EMISSION CONTROL REQUIREMENTS FOR OFF-HIGHWAY RECREATIONAL VEHICLES



o Off-Road Motorcycles oo Specialty Vehicles ooo All-Terrain Vehicles (ATV)

Date of Release: June 5, 2013

Scheduled for Consideration: July 25, 2013

State of California

AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

PUBLIC HEARING TO CONSIDER THE PROPOSED ADOPTION OF EVAPORATIVE EMISSION CONTROL REQUIREMENTS FOR OFF-HIGHWAY RECREATIONAL VEHICLES

Date of Release: June 5, 2013

Scheduled for Consideration: July 25, 2013

Location: California Environmental Protection Agency (Cal-EPA)
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Byron Sher Auditorium, Second Floor
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Sacramento, CA 95814

Air Resources Board
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EXECUTIVE SUMMARY

In spite of a significant reduction in ozone precursors, California needs additional reductions of reactive organic gases (ROG) to achieve attainment of the ozone standard in all areas of the state. One of the largest sources of ROG is off-highway recreational vehicles (OHRV), which include all-terrain vehicles (ATV), off-road motorcycles, and specialty off-highway vehicles. Evaporative emissions produced by OHRVs operating in California account for 72 percent of the total ROG emissions from the category, with exhaust emissions accounting for the remaining 28 percent. Although evaporative emissions from these OHRVs are controlled by California OHRV permeation standards, this regulatory proposal will further reduce evaporative emissions from new OHRVs by more than 70 percent compared to existing OHRVs. Control of evaporative emissions from OHRVs will help to reduce ozone levels in non-attainment areas throughout California and especially in the San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast Air Quality Management District (SCAQMD). This regulatory proposal to control evaporative emissions from OHRVs is a key element in the State Strategy for demonstrating attainment with the 8-hour ozone federal air quality standard.

BACKGROUND

Mobile sources have historically been the largest source of ROG emissions in California. As vehicles have become progressively cleaner, the emissions contribution of off-road equipment and vehicles has become more prominent. The 8-hour federal ambient air quality standard (AAQS) for ozone is both more challenging and more protective of public health than the previous standard; therefore, evaporative emissions from all mobile sources, including OHRVs will need to be controlled. For the SJVAPCD and SCAQMD, the State Strategy for demonstrating attainment with the 8-hour ozone federal air quality standard includes the adoption of more stringent emission standards for OHRVs by 2013.

In 2002, the United States Environmental Protection Agency (U.S. EPA) promulgated the first evaporative emissions standards for OHRVs. These standards took effect in 2008 and control permeation from fuel tanks and hoses. The standards limit fuel tank permeation to 1.5 grams per square meter per day (g/m^2/day) and fuel hose permeation to 15 g/m^2/day starting with model year (MY) 2008 OHRVs. The Air Resources Board (ARB or Board) harmonized California requirements with these standards in 2006. These existing permeation requirements only control a small fraction of evaporative emissions from over one million OHRVs operating statewide.

STAFF PROPOSAL

More comprehensive evaporative emissions control is an essential piece of the enforceable commitments for ROG emissions reductions in the State Strategy.

The proposed OHRV test procedure and evaporative emissions standard of 1 gram per day (g/day) of Total Organic Gas (TOG) for a 3-day diurnal utilizes the available evaporative emissions technology currently used in the on-road sector for OHRV applications. The standard represents a greater than 90 percent reduction per vehicle compared to baseline emissions levels. This regulatory proposal will control statewide summertime ROG by 3.4 tons per day (TPD) in 2023 and 12.5 TPD when fully implemented (90 percent) in 2042.

The proposed regulation requires a carbon canister integrity tip test to verify canister protection from liquid fuel contamination when an OHRV is tipped. This test is especially important for off-road motorcycles, which are more likely to tip over than ATVs or specialty vehicles. The tip test is designed to ensure that evaporative emissions controls for OHRVs are properly designed for real-world operating conditions and last the life of the vehicle. The tip test remains an outstanding concern for OHRV manufacturers because it may require fuel tank re-design. As an alternative to the proposed tip test, manufacturers may submit an equivalent test procedure to ARB for an engineering review and approval by the Executive Officer.

It is critical that ARB achieves these additional ROG emissions reductions, particularly given the magnitude of California's ozone problem and the State Strategy's reliance on yet-to-be developed technology. These future benefits will be especially valuable to California as a warming climate makes ozone attainment more difficult.

ENVIRONMENTAL AND COST IMPACTS

The proposed regulation will deliver substantial ROG emissions reductions for the 2023 timeline set for attainment of the federal 8-hour ozone standard and it will continue to deliver air quality benefits far into the future because of the relatively long lifetime of OHRVs.

Staff has determined that no significant adverse environmental impacts would result from implementation of the regulatory proposal. This is because the regulatory provisions merely propose emission standards to reduce diurnal and spillage emissions from OHRVs, which would be easily accomplished by using already existing technologies.

This regulatory proposal has an average cost-effectiveness of 6.93 dollars per pound ($/lb.) compared to the inflation adjusted cost of 8.01 $/lb. for the on-road motorcycle exhaust regulation adopted in 1998. The cost to control emissions per OHRV increases significantly for manufacturers of evaporative families with sales of less than 150 OHRVs per year in California. These manufacturers account for a small fraction (less than 13 percent) of OHRV sales in the State. The cost of the regulation includes cost savings to the end user from reduced fuel consumption due to lower evaporative emissions resulting from the proposed diurnal standard. A likely indirect effect of this regulatory proposal is that OHRV manufacturers will choose to use electronic fuel injection to meet the stringent diurnal standard. Depending on the EFI engine control unit calibration, this could result in fuel cost savings from increased engine combustion efficiency.

STAFF RECOMMENDATIONS

Staff recommends that the Board adopt this regulatory proposal to greatly reduce evaporative ROG emissions from OHRVs. The standards were developed in close collaboration with stakeholders to minimize the cost to comply while still achieving the emissions reductions that California needs. In fact, the stringent diurnal standard in the proposed regulation was recommended by industry. The final form of the proposed emissions standard benefits from the input and knowledge of the OHRV manufacturers. In particular, the diurnal emissions test procedure has been designed to verify emissions control for running loss and hot soak events while minimizing the testing and compliance costs for industry.

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TABLE OF CONTENTS

I. INTRODUCTION AND BACKGROUND 1

A. INTRODUCTION 1

B. VEHICLES IN CATEGORY SUBJECT TO PROPOSED REGULATIONS 1

C. REGULATORY AUTHORITY AND LEGAL REQUIREMENTS 3

1. *Authority to Control Mobile Sources under Federal Clean Air Act* 3

2. *Legal Requirement to Submit a SIP* 4

3. *Regulatory Powers and Responsibilities Conferred by State Law* 4

4. *Commitments under 2007 Amendments to the SIP* 4

D. REGULATORY HISTORY OF OHRV EMISSIONS CONTROL IN CALIFORNIA 5

1. *First Emissions Standards for OHRV Set in 1994* 5

2. *Limitations on Use of Uncontrolled OHRV in California* 5

3. *Federal Regulation of Evaporative (Permeation) Emissions from OHRV* 6

4. *Harmonizing with Federal Evaporative Emissions Regulations* 6

E. NEED FOR EMISSIONS REDUCTIONS 6

F. RATIONALE FOR CONTROLLING OHRV EVAPORATIVE EMISSIONS 7

G. STAKEHOLDER PARTICIPATION 7

II. DESCRIPTION OF THE PROBLEM AND PROPOSED SOLUTIONS 9

A. MECHANISMS OF EVAPORATIVE EMISSIONS FROM MOBILE SOURCES 9

B. CHARACTERIZING EVAPORATIVE EMISSIONS FROM OHRVS 10

C. TECHNOLOGY TO CONTROL EVAPORATIVE EMISSIONS FROM MOBILE SOURCES 12

1. *Low-Permeation Materials* 12

2. *Activated Carbon Canisters* 13

3. *Pressure Relief Valves* 13

4. *Strategic Placement or Insulation of Fuel Tank* 14

5. *Connectors, Improved Carburetors, and Fuel Injection* 14

D. TEST RESULTS FOR UNCONTROLLED AND CONTROLLED OHRV EQUIPMENT 14

E. RATIONALE FOR PROPOSED STANDARDS 16

F. SAFETY PRECAUTIONS INCORPORATED INTO PROPOSED REGULATION 18

III. RECOMMENDED BOARD ACTION 19

A. SUMMARY OF RECOMMENDED BOARD ACTION 19

1. *Comprehensive Evaporative Emissions Standards for OHRVs* 19

2. *Independent Emission Standards for Evaporative and Exhaust Emissions* 19

3. *Flexibility for Certification* ... 19
4. *Incorporation of New Test Procedure* ... 20
5. *Durability Requirements to Ensure In-Use Control* ... 20

B. SUMMARY OF ALTERNATIVES PRESENTED ... 20

1. *No Action* ... 20
2. *Removal of the Tip Test from the Current Proposal* ... 21
3. *Propose Separate Standards for Each Mode of Use* ... 22

IV. AIR QUALITY BENEFITS ... 22

A. ROG EMISSIONS REDUCTIONS IN SUPPORT OF OZONE ABATEMENT ... 23

B. CLIMATE CHANGE CONSIDERATIONS ... 24

1. *Reduced Fuel Consumption* ... 24
2. *Indirect Warming Impacts* ... 25

C. REDUCTION OF EXPOSURE TO TOXIC EMISSIONS ... 25

V. ENVIRONMENTAL IMPACTS ANALYSIS ... 26

A. INTRODUCTION ... 26

B. ENVIRONMENTAL REVIEW PROCESS ... 26

C. PRIOR ENVIRONMENTAL ANALYSIS ... 26

D. PROPOSED REGULATION ... 27

1. *Description* ... 27
2. *Methods of Compliance* ... 27

E. ENVIRONMENTAL IMPACTS ... 28

1. *Beneficial Impacts* ... 28
2. *Resource Areas with No Impacts* ... 28

VI. ENVIRONMENTAL JUSTICE ... 29

VII. ECONOMIC IMPACT ANALYSIS ... 30

A. LEGAL REQUIREMENTS ... 30

B. ESTIMATED COSTS OF THE PROPOSED REGULATORY ACTION ... 31

C. POTENTIAL IMPACT ON BUSINESSES, BUSINESS COMPETITIVENESS, EMPLOYMENT, AND BUSINESS CREATION, ELIMINATION, OR EXPANSION ... 34

1. *Potential Impact on Businesses* ... 34
2. *Potential Impact on Business Competitiveness and Employment* ... 35
3. *Potential Impact on Business Creation, Elimination, or Expansion* ... 35
4. *Potential Impact on Consumers* ... 36

D. Potential Impact to California State or Local Agencies 36
E. Alternatives 37
1. *Economic Impacts of Taking No Action* *37*
2. *Economic Impact of Eliminating the Carbon Canister Protection Tip Test* *37*
3. *Economic Impact of Separate Standards for Each Mode of Use* *37*
VIII. SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION 39
IX. REFERENCES 45

LIST OF ATTACHMENTS

A) Proposed Regulation Order to Adopt Evaporative Emission Controls for Off-Highway Recreational Vehicles

B) Proposed Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles (TP-933)

C) Emissions Estimation Methodology for Off-Highway Recreational Vehicles

D) Supporting Information for Economic Analysis

E) Public Process for Development of Proposed Action Information

LIST OF TABLES

Table I-1: Public Workshops 7
Table I-2: Pre-Hearing Meetings and Teleconferences 8
Table I-3: Issues Raised by Industry and Stakeholders 8
Table II-1: Summary of Results from the OHRV SHED Tests 16
Table IV-1: Summertime ROG Reductions Expected from the Regulatory Proposal in TPD, for Key Attainment Years and Regions in California. 23

LIST OF FIGURES

Figure I-1: Off-Road Motorcycle 2
Figure I-2: All-Terrain Vehicle 2
Figure I-3: Specialty Vehicle (Off-Road Utility Vehicle) 2
Figure I-4: Specialty Vehicle (Sand Car Shown) 2
Figure II-1: Carbon Canister Multi-Day Diurnal Emissions 11
Figure II-2: Co-Extruded Fuel Tank Barrier Layers 13
Figure II-3: ATV SHED Testing in El Monte 15
Figure II-4: Off-Road Motorcycle SHED Testing in El Monte 15
Figure II-5: Breakdown of California OHRV Emissions by Usage Mode 17
Figure II-6: 7-Day Diurnal Emission Test Results 17
Figure III-1: Fuel Tank Roll-Over Valve 22
Figure VII-1: Summary of OHRV Cost per Vehicle per Evaporative Family 32
Figure VII-2 Summary of Cost-Effectiveness per Vehicle 32
Figure VII-3: OHRV Cost-Effectiveness Compared to Similar Regulations 34
Figure VIII-1: Example of Tamper-Resistant Screw Types 43

LIST OF ACRONYMS

AAQS	Ambient Air Quality Standard
ARB	[California] Air Resources Board
ATV	All-Terrain Vehicle
CAA	[Federal] Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
DMV	[California] Department of Motor Vehicles
EVOH	Ethylene Vinyl Alcohol
HSC	[California] Health and Safety Code
ISOR	Initial Statement of Reasons
LSI	Large Spark-Ignition [engine]
MIC	Motorcycle Industry Council
MY	Model Year
OHRV	Off-Highway Recreational Vehicles
PY	Person Year
ROG	Reactive Organic Gases
SCAQMD	South Coast Air Quality Management District
SHED	Sealed Housing for Evaporative Determination
SJVAPCD	San Joaquin Valley Air Pollution Control District
SIP	State Implementation Plan
SORE	Small Off-Road Engine
TP	Test Procedure
TOG	Total Organic Gases
TPD	Tons per Day (emissions rate)
U.S.C.	United States Code
U.S. EPA	United States Environmental Protection Agency

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I. INTRODUCTION AND BACKGROUND

A. INTRODUCTION

This report presents the Initial Statement of Reasons (ISOR) in support of proposed adoption of comprehensive evaporative emission control requirements for off-highway recreational vehicles (OHRV).

Air Resources Board (ARB or Board) staff recommend adoption of regulatory provisions establishing evaporative emission standards for 2018 and subsequent model year (MY) OHRVs manufactured for use in California. The following are key aspects of the regulatory proposal:

- Expands control of evaporative emissions from OHRVs to include a stringent diurnal standard as well as a "tip test" to address potential fuel spillage on all vehicle modes;
- Provisions for certification, labeling requirements, enforcement, recall, and use restrictions;
- A flexible 4-year phase-in period (MY 2018, 2019, 2020, and 2021) where the manufacturer must show that 75 percent of their new sales are certified for those years; and
- A new test procedure to determine evaporative emissions from OHRVs.

The remainder of this section details the regulatory context, legal requirements, and need for comprehensive evaporative emission control of OHRVs. The rationale for the regulatory proposal, as well as the public process by which it was developed, are then briefly summarized.

Section II describes the problem as well as currently available control measures; Section III summarizes the recommended Board Action and its alternatives; Section IV presents the air quality benefits of the regulatory proposal; Sections V and VI detail the environmental as well as environmental justice impacts of the proposed regulation; Section VII offers an analysis of economic and fiscal impacts; and Section VIII summarizes the rationale for each regulatory provision.

The proposed regulation order (Article 3, Chapter 9, Division 3, Title 13, California Code of Regulations (CCR)) is presented in Attachment A. The proposed *Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles* (TP-933) is in Attachment B. Supporting information detailing relevant emission inventories is included in Attachment C. Supporting information relevant to economic and cost-benefit analysis is contained in Attachment D.

B. VEHICLES IN CATEGORY SUBJECT TO PROPOSED REGULATIONS

Proposed evaporative emission standards and test procedures apply to gasoline-fueled OHRVs. Specifically, this regulatory proposal applies to off-road motorcycles (also known as dirt bikes) (Figure I-1), all-terrain vehicles (ATVs) (Figure I-2), and specialty vehicles which includes off-road sport vehicles (Figure 3), off-road utility vehicles, sand cars (Figure 4),as defined in Cal. Code Regs., tit.13, § 2411.

Figure I-1: Off-Road Motorcycle

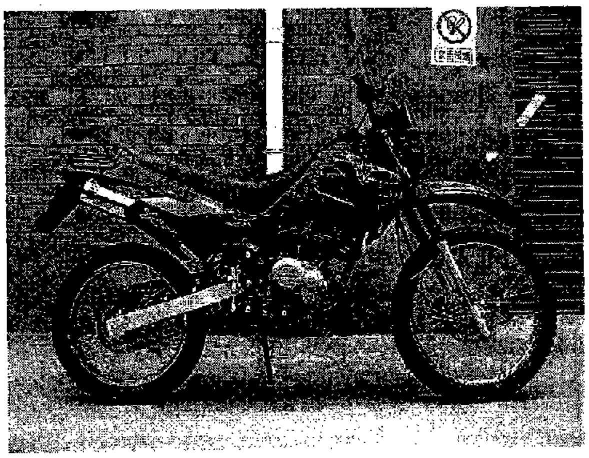


Figure I-2: All-Terrain Vehicle

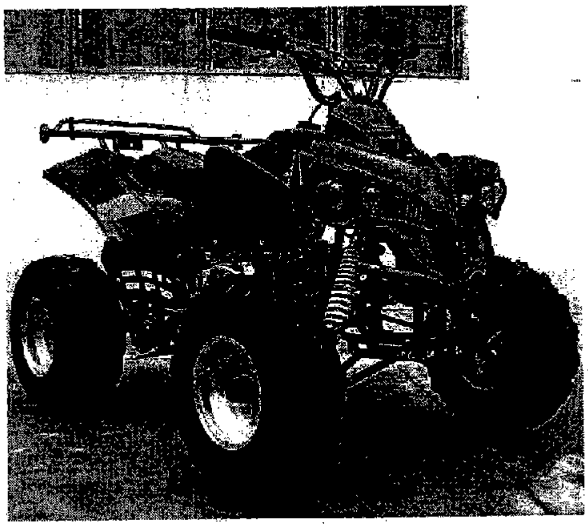
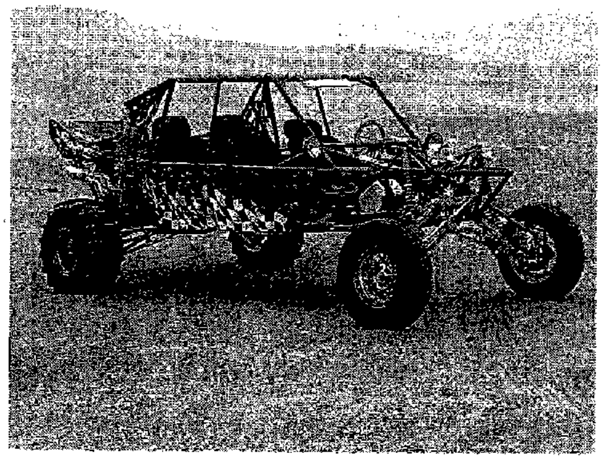


Figure I-3: Specialty Vehicle (Off-Road Utility Vehicle)

Figure I-4: Specialty Vehicle (Sand Car Shown)



Gasoline-fueled golf carts and go-karts are not included in this regulatory proposal. Rather, they are subject to ARB's small off-road engine (SORE) or large spark ignition (LSI) engine regulations, depending on whether their engines are greater than 25 horsepower (see ARB's OHRV website). Snowmobiles are considered federal sources and are not subject to California's OHRV regulations.

Competition vehicles, also known as "race-only vehicles" or "racing vehicles" and defined as vehicles operated exclusively on closed courses in sanctioned racing events, are exempt from California's OHRV emissions regulations (Health and Safety Code (HSC) Section 43001).

C. REGULATORY AUTHORITY AND LEGAL REQUIREMENTS

Authority to adopt and enforce the proposed regulation is granted to California's Air Resources Board through a combination of federal and State laws. ARB's legal requirement to submit a State Implementation Plan (SIP) is also articulated by federal and state legislation. In 2007, the Board adopted amendments to California's SIP that commits ARB to comprehensively address OHRV evaporative emissions; current control is limited to permeation from fuel tanks and hoses (ARB, 2009).

1. *Authority to Control Mobile Sources under Federal Clean Air Act*

Under Section 209(b) of the Federal Clean Air Act (CAA), the State of California has the singular distinction of being granted the power to adopt and enforce rules to control emissions from new mobile sources (CAA, 1990). California's exemption from CAA provisions that otherwise prevent states from setting their own standards for motor vehicle emissions recognizes California's long-standing air pollution challenges and honors the State's pioneering efforts to reduce motor vehicle emissions (NRC, 2006).

Section 209(e)(2) of the CAA (42 U.S.C § 7543) requires California to receive authorization from the Environmental Protection Agency (U.S. EPA) Administrator prior to enforcing regulations on mobile sources, including new off-road vehicles and engines. Authorization to regulate exhaust emissions from OHRV was granted to California in December 1996 (Cal. Code Regs., tit.13, § 2411; 61 Fed. Reg. 69093, December 31, 1996).

2. Legal Requirement to Submit a SIP

The CAA also requires, as codified in 42 U.S.C § 7410, each State, including California, to submit a plan providing for the "implementation, maintenance, and enforcement" of primary as well as secondary air quality standards, which protect human health and welfare, respectively, within each air quality region of the State. SIPs are required to be submitted within three years of the promulgation or revision of a national ambient air quality standard (AAQS).

3. Regulatory Powers and Responsibilities Conferred by State Law

ARB is named as the agency responsible for control of emissions from motor vehicles in the HSC Section 39500 as well as the air pollution control agency "for all purposes set forth in federal law" in HSC Section 39602. Specifically named among ARB's general duties and powers (HSC Sections 39600-39619.8) are the responsibilities to prepare California's SIP and to coordinate all local air quality management district activities necessary to comply with the CAA. Furthermore, ARB must achieve the maximum feasible, cost-effective reductions of emissions from all mobile source categories under its jurisdiction (HSC Sections 43013, 43018).

4. Commitments under 2007 Amendments to the SIP

In September 2007, the Board adopted Amendments to the SIP, which comprises State and local air quality planning showing how and when California will meet AAQSs. The 2007 State Strategy articulated by the 2007 SIP Amendments is the first to address the federal 8-hour AAQS for ozone (0.08 parts per million, ppm) as well as the 24-hour and annual standards for fine particles ($PM_{2.5}$) (65 micrograms per cubic meter ($\mu g/m^{3}$) and 15 $\mu g/m^3$, respectively). These federal AAQS were originated by U.S. EPA in 1997 in response to scientific evidence substantiating adverse health effects at lower levels than had previously been resolved. Due in part to litigation, as well as the extensive process required to establish area designations and boundaries, the 8-hour ozone standard was not finalized until 2004.

The 8-hour ozone standard is more stringent than the previous 1-hour standard and calls for more extensive emissions control strategies. Although California has already significantly reduced ambient ozone concentrations, the challenges posed by the more stringent standard provoked the reclassification of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast Air Quality Management District (SCAQMD) nonattainment designations as "extreme" with regard to the 8-hour standard. "Extreme" nonattainment areas rely on the development of new technologies or improvement of existing technologies, in addition to other enforceable commitments, to reduce emissions of ozone precursors, namely oxides of nitrogen (NO_X) and reactive organic gases (ROG) (Section 182(e)(5) of the CAA; 42 U.S.C § 7511(e)(5)).

Proposed new SIP measures in the 2007 State Strategy include expanded evaporative emissions standards from OHRVs. These expanded OHRV evaporative emissions standards are projected to deliver necessary ROG emissions reductions statewide by 2023, including in California's most challenging regions with regard to ozone control, namely the SCAQMD and the SJVACPD.

When the Board originally adopted the 2007 Amendments to the SIP, the Board was expected to take action on expanded evaporative emissions from OHRV by 2010, with implementation beginning in the 2012-2015 timeframe (ARB 2009). However, the rulemaking was delayed so that the emissions inventory could be updated. The creation of a new emissions inventory required staff to update emissions factors, perform usage surveys, and modify the fundamental assumptions associated with the inventory. To accommodate the inventory update, ARB adopted revisions to the rulemaking calendar for California's $PM_{2.5}$ SIPs on May 18, 2011. The updated calendar commits ARB to expanding OHRV emission standards in 2013, with implementation schedules to be determined during the rulemaking process.

D. REGULATORY HISTORY OF OHRV EMISSIONS CONTROL IN CALIFORNIA

1. First Emissions Standards for OHRV Set in 1994

As with light-duty vehicles, California initially led the U.S. in setting emissions standards for off-road mobile sources. In 1994, the Board adopted the first exhaust emissions standards for OHRVs, including off-road motorcycles and ATVs, which were previously not subject to any emissions control requirements. These standards established compliance dates starting with MY 1997 and MY 1999 for engines greater than and less than 90 cubic centimeters (cc) displacement, respectively. Modifications to the original rulemaking reclassified the scope of off-highway vehicular controls such that specialty vehicles, gasoline-fuel golf carts, and go-karts with less than 25 horsepower are now subject to SORE regulations, while those producing 25 horsepower or more are subject to LSI engine regulations.

2. Limitations on Use of Uncontrolled OHRV in California

In 1998, the Board approved amendments to OHRV regulations that link registration with compliance to exhaust emission standards, creating the red/green sticker program. Year-round operation is allowed only for emission-compliant dirt bikes and ATVs. OHRVs that are not compliant with ARB emission standards are issued a limited use red registration sticker through the California Department of Motor Vehicles (DMV). OHRVs with red registration stickers can only be operated on public land in accordance with the ARB Red Sticker Open Riding Schedule. Although control of competition and racing vehicles is beyond the scope of ARB, their use is limited to operation on closed courses in sanctioned racing events or by adhering to rules that apply for red sticker vehicles.

3. *Federal Regulation of Evaporative (Permeation) Emissions from OHRV*

In 2002, the U.S. EPA promulgated the first evaporative emissions standards for OHRVs and engines, including off-road motorcycles and ATVs. These standards, which took effect in 2008, control permeation losses from fuel tanks and hoses. The standards limit plastic fuel tank permeation to 1.5 grams per square meter per day (g/m^2/day) and fuel system hose permeation at 15 g/m^2/day.

4. *Harmonizing with Federal Evaporative Emissions Regulations*

In 2006, ARB amended its OHRV emissions regulations to harmonize with evaporative emissions standards adopted by U.S. EPA in 2002, to control permeation emissions from fuel tanks and hoses. Additional revisions adopted in 2006 addressed the riding seasons for noncompliant vehicles, clarified which vehicles are subject to the OHRV regulation, and inserted into the regulations labeling requirements that had been previously incorporated by reference.

E. NEED FOR EMISSIONS REDUCTIONS

The South Coast and San Joaquin Valley air basins are currently the only extreme nonattainment areas in the nation. The federally approved State Strategy for demonstrating 8-hour ozone attainment in these areas relies on the use of a mix of currently available technologies in combination with the development of advanced technologies. This regulatory proposal is based on the transfer of currently available technology from the on-road sector that can be cost-effectively scaled for use on OHRVs.

Evaporative emissions control of OHRVs is currently limited to permeation from fuel tanks and hoses, which account for only a fraction of uncontrolled emissions. Expanding OHRV evaporative emissions control beyond their current scope is an essential piece of the enforceable commitments for ROG emissions reductions articulated in the State Strategy. The 2007 State Strategy estimates that by 2023, the SJVAPCD and the SCAQMD will need an additional 54 tons per day (TPD) and 25 TPD of ROG emissions reductions, respectively, from all sources, including OHRVs (ARB, 2009). This regulatory proposal will provide ROG emission reductions of 0.6 TPD and 1 TPD for SJVAPCD and the SCAQMD respectively in 2023. In 2035 the reductions will be over 1.6 TPD and 3 TPD respectively when the regulation is 70 percent implemented.

Due to the long vehicle life of OHRVs, the greatest reductions are expected after full implementation in 2042.. This regulatory proposal will deliver substantial longer term emissions reductions anticipated for future, more stringent air quality standards.

F. RATIONALE FOR CONTROLLING OHRV EVAPORATIVE EMISSIONS

Mobile sources have historically been the largest source of ROG emissions in California. As on-road mobile sources have become progressively cleaner, the role of off-road sources, as well as mobile sources under federal and international jurisdiction (e.g., ships, locomotives, and aircraft) has become more prominent. To attain the 8-hour federal AAQS for ozone, which is both more challenging and more protective of public health than the previous standard, it is necessary to incorporate expanded off-road mobile source emissions control into California's State Strategy.

Fortunately, technologies that have been successfully used for controlling evaporative emissions from on-road vehicles are readily available and can substantially reduce evaporative emissions from OHRVs. It is critical that ARB achieve these readily available evaporative emissions reductions from OHRVs, particularly given the magnitude of California's ozone problem and the State Strategy's reliance on yet-to-be developed technologies.

Specific rationale for each proposed regulatory provision is provided in Section VIII, Summary and Rationale for Each Regulatory Provision.

G. STAKEHOLDER PARTICIPATION

For the past six years, ARB staff have invited public participation during the development of the proposed regulation, test procedure, and analysis of underlying data. In early 2006, ARB mailed approximately 1,500 letters to dealers and manufacturers of OHRVs in California to invite participation in the rulemaking process. In March 2006, at a public workshop in El Monte, ARB introduced the idea of comprehensive evaporative emissions standards for OHRVs as a means of building on what was then the near-term effort to adopt U.S. EPA's design standards for limiting permeation emissions from fuel tanks and fuel lines.

Among key stakeholders involved in the initial workshop and ongoing discussions was the Motorcycle Industry Council (MIC), which represents all major manufacturers of OHRVs for California markets.[1] Since early 2006, four public workshops (Table I-1) and nearly forty stakeholder meetings (Table I-2) have been held on all aspects of the regulatory proposal (Table I-3 and Attachment E).

Table I-1: Public Workshops

LOCATION	DATE

[1] "More than 300 members represent manufacturers and distributors of motorcycles, scooters, parts and accessories, as well as allied trades such as publishing, insurance and consultants. While dealers, clubs and individuals are not eligible for membership, the MIC works with these groups on issues of mutual interest." (http://www.mic.org/)

El Monte	3/24/2006
Sacramento	9/6/2006
El Monte	4/20/2010
El Monte	12/18/2012

Table I-2: Pre-Hearing Meetings and Teleconferences

PARTICIPANTS	DATES
MIC and OHRV Manufacturers	1/14/2009, 1/15/2009, 4/7/2010, 4/29/2010, 7/21/2010, 9/30/2010, 11/8/2010, 11/9/2010, 11/7/2011, 3/22/2011, 4/27/2011, 8/18/2011, 9/26/2011, 3/5/2012, 4/17/2012, 4/25/2012, 10/17/2012, 3/6/2013, 3/25/2013, 4/4/2013, 4/12/2013
U.S. EPA	3/14/2013
Harley Davidson	8/26/2010, 9/27/2011, 11/7/2011, 5/4/2012,12/18/2012, 2/25/2013, 3/14/2013
MeadWestvaco	7/15/2009, 12/2/2009, 5/3/2011, 9/18/2012
Honda	11/2/2010, 11/9/2010, 3/27/2013
Evaporative Emissions Consulting Inc.	11/9/2009, 2/8/2010, 2/9/2010

Standards were developed in close collaboration with stakeholders. The final form of the proposed emissions standard represents a general consensus reached between ARB and industry (Table II-3). In particular, ARB proposes to adopt the diurnal standard proposed by industry.

Table I-3: Issues Raised by Industry and Stakeholders

ISSUES	STAFF RESOLUTION
Economic conditions make complying with the proposed	Delay implementation until MY 2018 and allow a flexible 4-year phase-in schedule.

regulation more difficult	
Make evaporative test plan aligned with exhaust testing to increase cost-effectiveness	Allow evaporative preconditioning to be completed in conjunction with the mileage accumulation for exhaust testing, so long as the fuel system continuously has E10 (10% ethanol) fuel in it for a total of 140 days.
High cost of vehicle testing	Reduce the number of required vehicle evaporative tests performed in a Sealed Housing for Evaporative Determination (SHED). Running loss and hot soak testing are now preconditioning cycles to the measured diurnal test.
High variable volume SHED testing cost	Develop a reduced cost, 24-hour fixed volume SHED test with calculated vented emissions.
Safety concerns with pressurized fuel tank	Require fuel tank pressure to be released before the fuel tank can be opened.
Vehicle tampering may limit effectiveness of this regulatory proposal	Include anti-tampering requirements on all OHRVs: evaporative component placement, tamper resistant fasteners, and a vehicle tag. The vehicle tag is expected to increase consumer awareness of illegal vehicle tampering.
Designing for the carbon canister integrity test is expensive	The carbon canister integrity test is essential to an effective regulation. To lower the cost of complying, the proposed number of required SHED tests was reduced. Running loss and hot soak tests are now preparation cycles, and a 24-hour SHED test with calculated vented emissions is allowed as an alternative to the 72 hour SHED test.

II. DESCRIPTION OF THE PROBLEM AND PROPOSED SOLUTIONS

A. MECHANISMS OF EVAPORATIVE EMISSIONS FROM MOBILE SOURCES

The TOG emissions targeted by this regulatory proposal are a class of hydrocarbon emissions that are precursors for criteria air pollutants such as ozone. Hydrocarbon emissions from OHRVs constitute two general categories, namely tailpipe exhaust emissions and evaporative emissions. The proposed regulation focuses exclusively on evaporative emission control. Evaporative hydrocarbon emissions can be further classified by the mechanism through which they enter the ambient air: fuel permeation through fuel system components, vented emissions from vapor growth in the fuel tank, vented emissions from the carburetor, and liquid leakage and spillage emissions. In practice, vented carburetor and liquid leakage emissions are often grouped together because routine testing cannot distinguish between the sources.

Permeation occurs when hydrocarbon molecules diffuse through the walls of the fuel tank and fuel lines and is continuous whether the OHRV is in operation or in storage. Permeation is a function of fuel and material properties, material thickness, and temperature.

Vented hydrocarbon emissions are driven by two mechanisms. First, emissions occur when a rise in the surface temperature of the liquid fuel causes a corresponding increase in the hydrocarbon vapor concentration of the head space. Second, emissions occur when the vapor volume increases with temperature, as described by the ideal gas law. Vented emissions are generated by engine heat and natural diurnal temperature swings.

Carburetors can emit vented hydrocarbon emissions when heated during operation or immediately after the engine is shut off. The hydrocarbons that are lost due to venting represent the constituents of gasoline that have the highest partial pressures and thus evaporate most quickly.

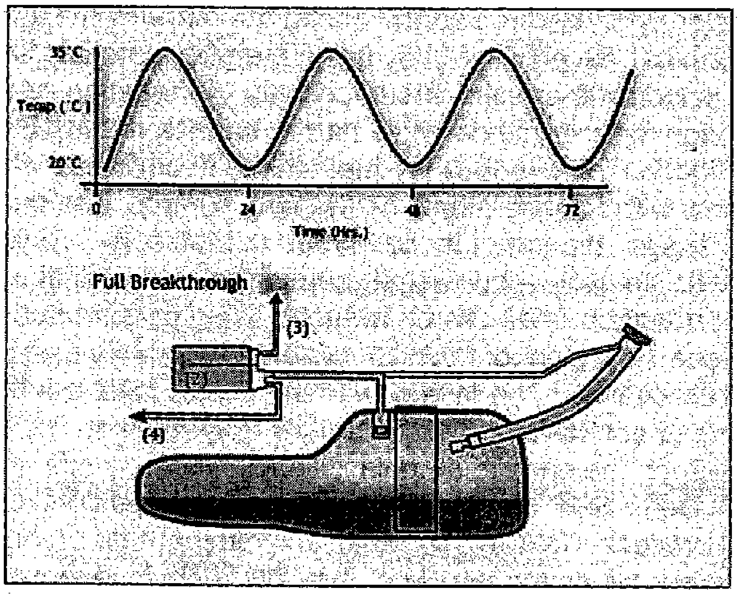
Liquid fuel leaks seep through loose connection points such as gaskets and fuel lines, as well as spillage associated with vehicular tipping. Seeping through fuel line connection points can occur when a connection mechanism degrades and does not seal properly. Seeping from gaskets is generally from the carburetor and occurs because of poor or degrading gasket material. Gasket seepage is exacerbated by vibration as well as changes in fuel level associated with changes in spatial orientation. Liquid fuel leaks occur during operation and storage.

B. CHARACTERIZING EVAPORATIVE EMISSIONS FROM OHRVS

For regulatory purposes, mechanisms of evaporative emissions delineated above must be subjected to specific usage modes, namely running loss, hot soak, and diurnal, which are defined below. As described in the proposed regulation order (Attachment A) and Sections III and VIII, the proposed regulation establishes emission standards to reduce evaporative emissions produced by OHRVs during permeation, venting, liquid leakage, and spillage. The evaporative emission testing cycle begins with a fuel system tip test to visually verify the absence of liquid leakage. Next, a running loss and hot soak preconditioning cycle is conducted to replicate vehicle operation, canister purging, and to subject the vehicle to a soak that occurs directly after operation. Upon completion of the preconditioning cycles, the diurnal test, which is designed to replicate real-world vehicle storage patterns, is performed and measured. The proposed emission standards eliminate redundancy in testing and allow manufacturers flexibility to choose the combination of technology that works best for their application.

The proposed diurnal standard is measured in three consecutive 24-hour increments over a total test time of 72 hours (Figure II-1), which assesses carbon canister breakthrough. The standard ensures that canisters must be adequately designed to control long-term diurnal storage emissions. The bottom half of Figure 5 shows a evaporative control system including the
(1) fuel tank, (2) carbon canister, (3) vent line, and (4) intake manifold line.

Figure II-1: Carbon Canister Multi-Day Diurnal Emissions



Source: MeadWestvaco, 2013

Running Loss evaporative emissions are emitted while the OHRV is in use. For an uncontrolled OHRV, running loss emissions come from carburetor venting, liquid leakage, fuel tank venting, and to a lesser degree, permeation. Running loss permeation emissions are generally not significant for OHRV because the typical duration of engine operation for OHRVs is relatively short.

Hot soak emissions occur immediately after a running loss event. The sources of hot soak emissions arise from the carburetor, leakage, venting, and permeation. Venting emissions tend to dominate this mode, because the hot engine transfers heat to the fuel tank. Carburetor and leakage emissions can also be significant. Permeation emissions tend to be small because the duration associated with hot soak emissions is short.

Diurnal emissions occur while the OHRV is in storage. Permeation and vented emissions account for a substantial portion of diurnal emissions. In a poorly designed or aged system, carburetor and leakage emissions can also be significant. Note that all references to diurnal emissions in this document consist of both diurnal and resting loss processes as defined in Attachment C.

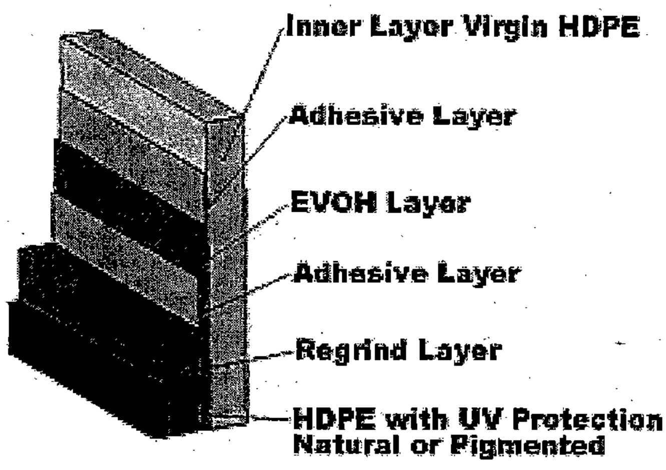
C. TECHNOLOGY TO CONTROL EVAPORATIVE EMISSIONS FROM MOBILE SOURCES

A variety of technologies are available to help manufacturers meet the proposed emission standards. Staff anticipate that this regulatory proposal will encourage manufacturers will use downsized and proven on-road automobile technology for control of OHRV evaporative emissions.

1. Low-Permeation Materials

Permeation is controlled through the use of low permeation barrier layers such as post mold barrier treatments, co-extruded barrier layers, resin based additives, and/or nylon barriers added during the manufacturing process. Fuel tank permeation can be eliminated by using metallic materials like aluminum or steel. Where polyethylene resins are necessary, permeation rates can be mitigated through the use of post mold barrier surface treatments like fluorination. Fluorination exposes the fuel tank to fluorine gas which replaces hydrogen atoms with fluorine atoms on the tank surface. The fluorinated surface layer 'blocks' the path that hydrocarbon molecules would normally take through the resin, thereby reducing permeation rates. In addition to barrier treatments, permeation rates can be reduced using co-extruded barrier layers such as ethylene vinyl alcohol (EVOH). Co-extruded tanks using an EVOH barrier generally consist of six layers, with the EVOH layer sandwiched between layers of adhesive and High Density PolyEthylene ,HDPE (see Figure II-2). In the case of monolayer applications, a special additive called DuPont Selar RB® can be blended with certain polyethylenes during the blow molding process. Selar RB® results in a laminar that produces overlapping layers within the tank wall. The overlapping layers create a "tortuous path" that impedes the permeation of gasoline. For fuel tank production processes involving rotational molding, the introduction of nylons offer low permeation rates due to its crystalline structure.

Figure II-2: Co-Extruded Fuel Tank Barrier Layers



Source: Agri Industrial Plastics, 2013

In addition to fuel tanks, low-permeation control strategies can be applied to fuel lines. Aside from running rigid non-permeable metal lines, there are several flexible fuel hoses (many contain a fluoroplastic permeation barrier) commercially available for OHRVs. Many of the hoses are capable of meeting the proposed 5 g/m2/day design-based small volume design standard.

2. *Activated Carbon Canisters*

Vented emissions can be controlled by using an activated carbon canister to trap hydrocarbon molecules that are forced out of the fuel tank vent line (see Figure II-1). Two mechanisms are available to prevent the carbon canister from reaching its saturation point and "overflowing" into the ambient air. First, passive purging occurs when hydrocarbons are pulled back into the tank head space during the contraction associated with diurnal cooling. When properly designed, a passively purged carbon canister can be as much as 65 percent efficient at preventing vented hydrocarbons from being emitted to the ambient air. The second mechanism for unloading a carbon canister is to use intake manifold vacuum to pull hydrocarbons from the canister into the engine, where they are combusted. OHRVs often spend long periods of time in storage between uses. During these storage periods, the carbon canister is only passively purged because active purging using intake manifold vacuum requires the vehicle to be in operation. In practice, this places an upper limit on control of diurnal emissions from OHRVs.

3. *Pressure Relief Valves*

Vented emissions can also be controlled by a pressure relief valve on the vent of the fuel tank. The valve holds pressure on the fuel and prevents vapors from escaping below a predetermined pressure.

4. Strategic Placement or Insulation of Fuel Tank

Another means by which to minimize vented emissions is to locate or insulate the fuel tank so that the head space and fuel inside the tank are not affected by large temperature increases due to engine heat or ambient temperature.

5. Connectors, Improved Carburetors, and Fuel Injection

Carburetor and leakage emissions are each controlled in different ways. Leakage emissions are controlled by using better fuel line connectors such as constant tension spring clamps on properly sized hose barbs or O-ring snap connections. Carburetor emissions can be controlled by re-designing the carburetor to eliminate gaskets that could be exposed to fuel, improving the gasket material, or using fuel injection instead of a carburetor. Fuel injection is extremely effective at controlling both leakage and carburetor emissions because the higher pressure in the fuel line renders use of proper connections imperative for safety and because the closed nature of the fuel system eliminates carburetor emissions. Fuel injection also eliminates carburetor leakage due to a tipped OHRV.

D. TEST RESULTS FOR UNCONTROLLED AND CONTROLLED OHRV EQUIPMENT

To verify the effectiveness of using proven automotive technology on OHRVs, ARB conducted extensive testing of a popular off-road motorcycle and an ATV for baseline emissions as well as emissions with evaporative control technology (Figure II-3 and Figure II-4). Both OHRVs were tested over the running loss, hot soak, and diurnal emissions modes. The controlled and uncontrolled evaporative emissions OHRV test results are summarized in

Table II-1 in grams (g) of Total Organic Gas (TOG).

Figure II-3: ATV SHED Testing in El Monte

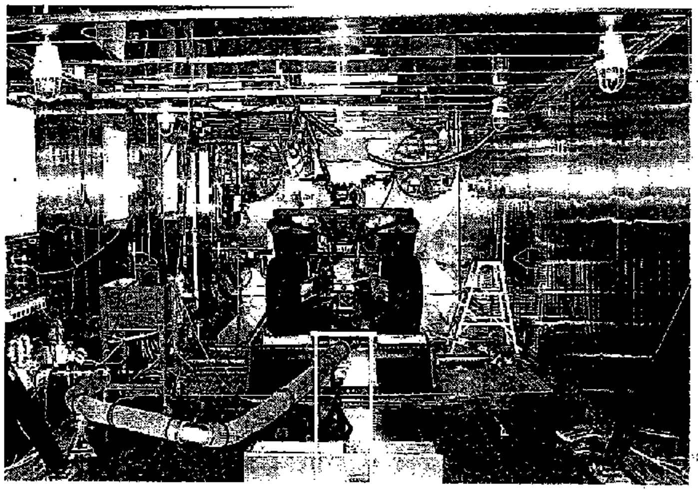


Figure II-4: Off-Road Motorcycle SHED Testing in El Monte

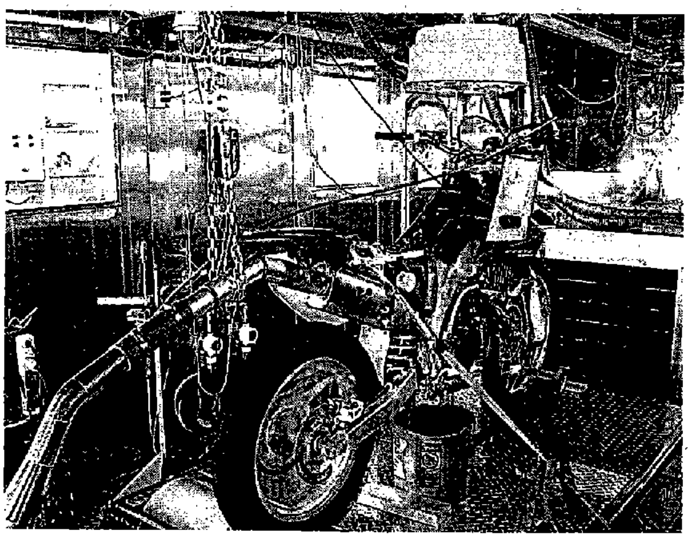


Table II-1: Summary of Results from the OHRV SHED Tests

Emission Control Status	Test Run ID	ATV (g TOG)			Off-Road Motorcycle (g TOG)		
		Running Loss (g)*	Hot Soak (g)**	Diurnal (g)***	Running Loss (g)*	Hot Soak (g)**	Diurnal (g)***
Uncontrolled	1	11.649	1.632	5.603	9.802	6.712	20.264
	2	11.511	2.233	5.643	10.342	5.705	17.735
	3	4.211	0.988	5.956	8.366	4.782	19.507
Uncontrolled Average (g):		**9.124**	**1.618**	**5.734**	**9.503**	**5.733**	**19.169**
Controlled	1	0.178	0.363	1.242	0.111	0.552	0.761
	2	0.097	0.268	1.093	0.129	0.712	0.968
	3	0.126	0.377	1.222	0.146	0.667	0.876
Controlled Average (g):		**0.134**	**0.336**	**1.186**	**0.129**	**0.644**	**0.868**
Percent Reduction:		**98.53%**	**79.23%**	**79.32%**	**98.64%**	**88.77%**	**95.47%**

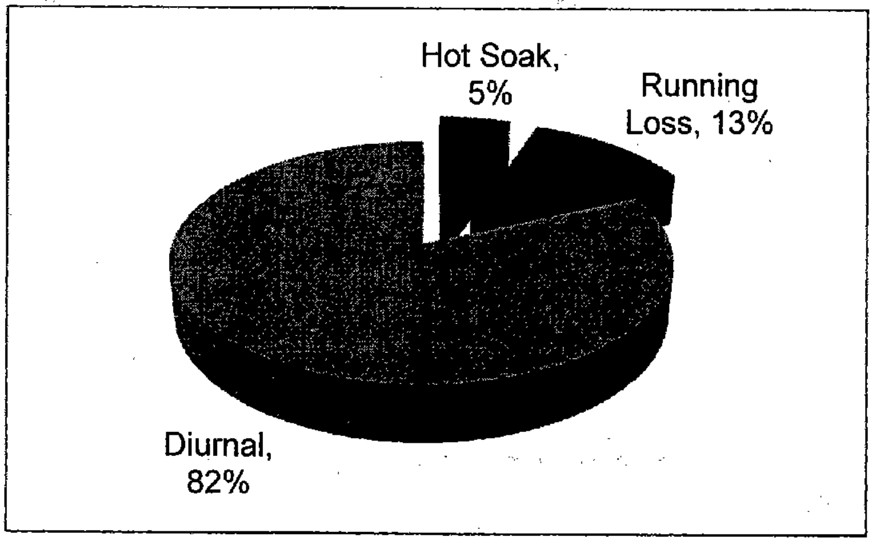
*23 minute test at 95°F
**1.5 hour test conducted at 95°F
***Diurnal temperature range was 72-96-72°F per 24-hour period

The data demonstrate that by fitting an OHRV with proven evaporative emissions control technology, already being used in the automotive sector, such as a carbon canister, low-permeation fuel systems, and fuel injection, evaporative emissions can be reduced significantly for all usage modes.

E. RATIONALE FOR PROPOSED STANDARDS

The proposed standards were defined based on the test results in Section D above where existing OHRVs were retrofitted with currently available evaporative emissions control technology. The standards reflect an emphasis on diurnal emissions control for two reasons. First, OHRV activity patterns include large periods of time when they are not operated, such that diurnal emissions contribute more than running loss and hot soak emissions. Secondly, the locations of diurnal emissions are concentrated where OHRVs are stored, in contrast to hot soak and running loss emissions, which occur where they are operated. Since OHRVs registered in California tend to be stored in urban areas with greater air pollution control issues than the rural areas where they are operated, diurnal emissions control is even more critical. Figure II-5 shows the breakdown of California OHRV evaporative emissions by usage mode. As shown, diurnal processes account for by far the largest fraction (82%) of evaporative emissions from currently operated OHRV in California. This is due largely to the relatively low usage and long storage periods for this type of equipment. Evaporative emissions associated with vehicle operations, namely from running loss and hot soak processes, account for the remaining 18% of evaporative emissions from the current fleet of OHRV in California. The data used to generate the graph is based on the emissions inventory data contained in Attachment C.

Figure II-5: Breakdown of California OHRV Emissions by Usage Mode

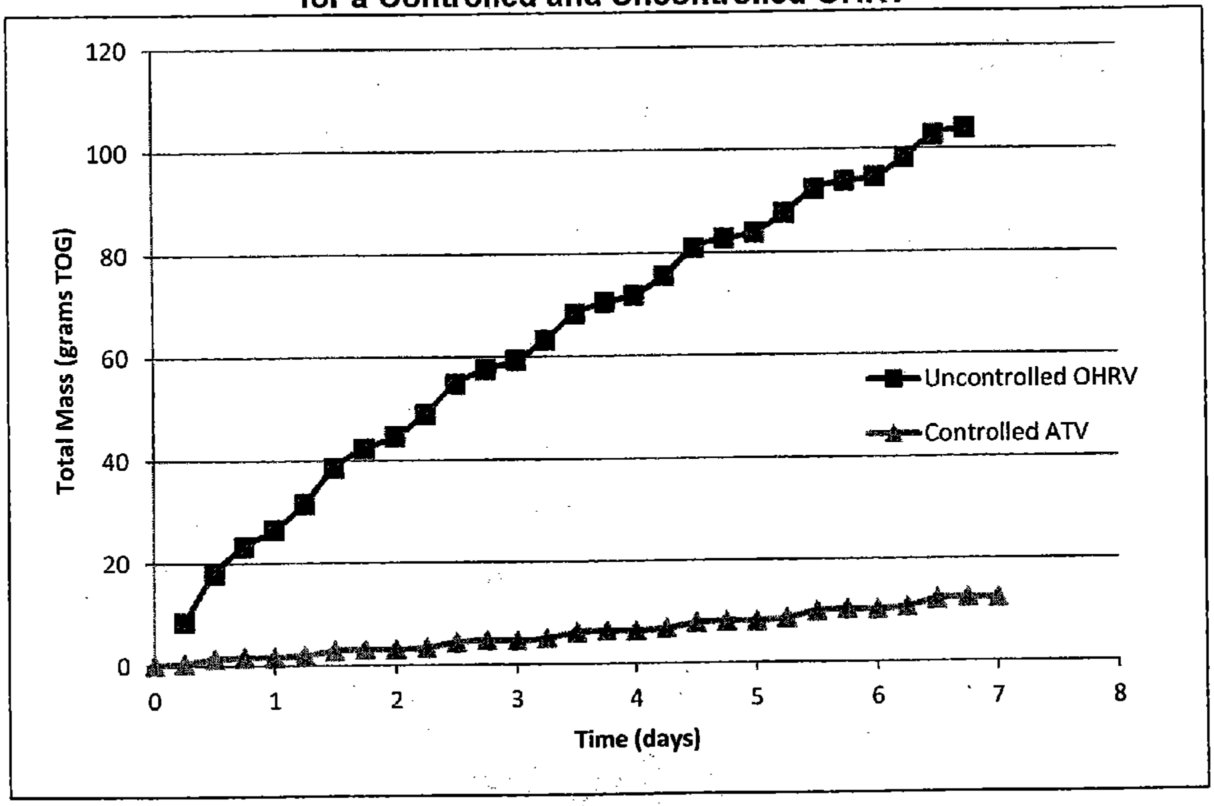


Ethanol is major component of California pump fuel so a standard based on TOG was chosen as opposed to ROG, which excludes ethanol. The 1 g TOG/day diurnal standard is very effective at controlling emissions and is supported by emissions testing data. The stringent diurnal standard allows manufacturers to perform the running loss and hot soak tests as preparation cycles to further reduce evaporative testing costs (see Attachment D).

Figure II-6 shows controlled and uncontrolled diurnal evaporative emissions from an OHRV over seven days. The 7-day test length is representative of an average period between weekend uses. The controlled data shows that a standard based on a 3-day diurnal effectively controls long-term storage emissions.

Figure II-6: 7-Day Diurnal Emission Test Results

for a Controlled and Uncontrolled OHRV



F. SAFETY PRECAUTIONS INCORPORATED INTO PROPOSED REGULATION

Based on experience with the same technology for on-road vehicles, the technology that manufacturers are likely to use has been demonstrated to be safe. In general, control technology will make OHRVs safer by limiting opportunities for escaped liquid fuel to cause fires. Pressurized fuel systems are a notable exception to enhanced safety associated with evaporative emissions controls. To address concerns raised by pressurized fuel systems, the proposed regulation requires that any pressure built up in the fuel system be slowly released before the fuel cap can be removed.

III. RECOMMENDED BOARD ACTION

A. SUMMARY OF RECOMMENDED BOARD ACTION

The recommended Board Action will achieve cost-effective emissions reductions of ROG (as described in Section VII) through comprehensive evaporative emissions standards that allow flexibility in the certification protocol and ensure the durability of control technology throughout a vehicle's useful life. This section describes key components of the recommended Board Action, as well as alternatives considered.

1. *Comprehensive Evaporative Emissions Standards for OHRVs*

This rulemaking proposes comprehensive control of evaporative emissions from OHRVs. This category of vehicles is currently subject to federal evaporative permeation standards as well as ARB exhaust standards that were originally adopted in 1994 and most recently amended in 2006. This rulemaking expands the current federal evaporative permeation standards, which are of limited scope, to include emission standards that apply to all evaporative emissions from OHRVs. Specifically, the proposed rulemaking sets diurnal emission standards.

2. *Independent Emission Standards for Evaporative and Exhaust Emissions*

The proposed evaporative emission standards are handled separately from the current, primarily exhaust-oriented, OHRV emissions regulation. Currently, OHRVs that do not meet exhaust standards and are issued a red registration sticker. The benefit of separate regulations is that the red sticker OHRVs will be required to meet evaporative standards, therefore providing a substantial reduction in ROG emissions from this class of vehicles. Furthermore, this rulemaking is written to avoid any duplicative requirements between the current exhaust and proposed evaporative emissions regulations in labeling, testing, and certification.

3. *Flexibility for Certification*

This proposal accommodates diversity in vehicle type and testing capabilities within the regulated community by offering multiple certification options. Manufacturers may certify OHRVs by meeting a stringent 1 g TOG/day diurnal standard, proposed by industry stakeholders. Manufacturers can demonstrate evaporative family compliance by following the test procedures associated with the 72-hour diurnal standard or the steady state diurnal standard. The standards associated with this rulemaking are described in detail in Table 1 of proposed Cal. Code Regs., tit.13, § 2418 (a)(1).

Manufacturers that produce less than 50 OHRVs per model year, for three consecutive MYs, are eligible to certify to the small volume evaporative emission design standard proposed in Cal. Code Regs., tit.13, § 2418(b). The small volume manufacturers may apply for a design-based certification that does not require a whole-vehicle SHED test.

The use of advanced fuel system technology is encouraged by allowing manufacturers to generate emissions credits from certification using diurnal test results that are lower than emission standards, or zero-emission vehicles. OHRV manufacturers may use earned credits to produce evaporative families above the diurnal standard; however, no single evaporative family may exceed three times the proposed diurnal standard (upper limit). The upper limit of three times the standard was reached through negotiation with stakeholders after considering their need for flexibility to minimize the cost impact of the regulatory proposal and ARB's need for emissions reductions. Placing an upper limit on evaporative family certification values, or the evaporative family emissions limit, EFEL, is needed because of the relatively long lifetime associated with OHRVs. The advanced fuel system credit program is designed to encourage the production of zero-emission vehicles, therefore increasing the availability of this technology in the off-road market.

4. *Incorporation of New Test Procedure*

A new test procedure, TP-933 (Attachment B), is incorporated into this regulatory proposal to determine OHRV evaporative emissions. TP-933 is the result of years of collaboration between ARB and industry to develop a testing sequence that mimics emissions that occur during real-world use.

5. *Durability Requirements to Ensure In-Use Control*

Both the test procedure and regulation emphasize verifying the durability of control technology. The test procedure subjects the vehicle to conditions that mimic what the components would endure throughout the useful life of the OHRV. These conditions include exposure to vibration, dust, and ultraviolet radiation. The proposed regulation includes a warranty period of 30 months for components with repair costs under $200 (adjusted for inflation) and 60 months for more expensive components. Following the precedent set by regulations in the light-duty motor vehicle sector, replacement costs are established based on dealers' list prices as well as standard labor price and time limits for warrantied components. Further durability provisions include the requirement that OHRVs have tamper-resistant emission control components and careful placement to help reduce emission control component tampering by the end user.

B. SUMMARY OF ALTERNATIVES PRESENTED

During the development of this regulatory proposal, three other proposals, including no action, were considered as alternatives to the proposed package. These alternatives are described below along with the rationale for staff's rejection of them.

1. *No Action*

Were the Board to abstain from adoption of more comprehensive OHRV evaporative regulations, the only evaporative emissions regulation for OHRVs would be the permeation design standards promulgated by U.S. EPA.

Although this course of action (inaction) would incur no additional cost to OHRV manufacturers, it would default on the State's 2007 SIP commitment to comprehensively address OHRV evaporative emissions. Moreover, to meet 2007 SIP commitments for specific reductions in ROG by specific dates, the ROG shortfall associated with not taking action on OHRV evaporative emissions would need to be made up in other areas. Proven ROG controls, such as those established in the light-duty motor vehicle sector are ready for transfer to OHRVs and do not exist for all other ROG sources.

2. *Removal of the Tip Test from the Current Proposal*

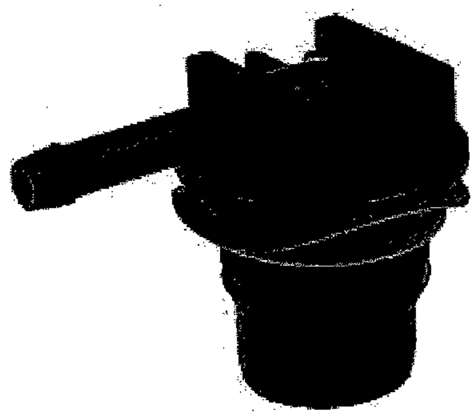
The durability tip test is important because carbon canisters are permanently damaged if exposed to liquid fuel when tipped during regular OHRV operation. Thus, to ensure that expected emissions reductions are achieved under real-world conditions, the tip test demands that canisters have minimal exposure to liquid fuel when tipped.

If the tip test were removed from the proposed rulemaking, it is expected that carbon canisters on OHRVs would not control emissions throughout their useful life. An OHRV usage survey suggests that off-road motorcycles are typically tipped at least once during each day of use. Without proper design, verified through the performance of a tip test, fuel would be repeatedly introduced into the carbon canister, causing virtually all off-road motorcycles to fail the emissions standard within months of being sold.

Although canister damage from liquid fuel could be found during enforcement of in-use emission standards, the inclusion of a tip test in the certification process pre-empts a situation wherein a population of poorly designed OHRVs could be introduced into the California market, creating an enforcement burden, demanding re-design to address in-use compliance, and ultimately sacrificing emissions reductions. In other words, OHRVs that satisfy in-use compliance requirements will also satisfy the tip test. Hence, this test is not deemed to add additional burden and is retained in the regulatory proposal.

The solution to the carbon canister contamination issue is a roll-over valve similar to the one shown in Figure III-1. In the event of a vehicle roll-over, the valve is designed to prevent fuel leakage. The cost of a roll-over valve is approximately 5 dollars and in some cases may require tank modification; many on-road motorcycles already use them.

Figure III-1: Fuel Tank Roll-Over Valve



3. Propose Separate Standards for Each Mode of Use

An earlier regulatory proposal required emissions from each OHRV usage mode, defined as running loss, hot soak, and diurnal, to be measured in a SHED enclosure. During regulatory development, stakeholders proposed a 1 g TOG/day diurnal standard. Their proposal requires use of sufficiently advanced technology so as to render hot soak and running loss evaporative emissions standards redundant. The current proposal removes the running loss and hot soak requirements and focuses on the major emissions source from this category, which is diurnal emissions (Attachment C).

The dominance of diurnal emissions reflects the fact that OHRVs are typically stored for long periods of time between uses. Moreover, OHRVs are often stored in urban areas that are non-compliant with regard to AAQSs for ozone, but are typically operated in rural areas, which have less severe air quality problems. Accordingly, it is more critical from an air quality perspective to control diurnal emissions.

The proposed standards offer sought-after flexibility to manufacturers while focusing on the dominant emissions mode. Relative to running loss and hot soak emissions, the diurnal emissions reductions achieved with this regulatory proposal are obtained in those parts of the State with the most significant air quality issues.

IV. AIR QUALITY BENEFITS

The primary air quality benefit associated with the regulatory proposal is the curtailment of ambient ozone through emissions reductions of ROG, a family of ozone precursors. Quantification of these benefits is supported by extensive emissions inventory modeling (Attachment C). The modeling reflects an updated population and vehicle life of OHRVs based on DMV registration data (DMV 2010), updated activity factors derived from a California-based OHRV user survey, technology trends such as the shift from carburetor to fuel injection delivery systems, and empirical evaporative emissions factors adjusted for a variety of influences such as garage temperature and spatial allocation.

Evaporative emissions reductions associated with this regulatory proposal are modeled based on the emissions inventory methodology described in Attachment C. The OHRV emissions inventory includes exhaust emissions and categories of vehicles, specifically snowmobiles and gasoline-fueled golf carts that are not subject to the proposed regulation. All material relating to these categories have been excluded in the calculation of emissions reductions associated with this regulatory proposal, unless otherwise noted. Projected ROG emissions reductions associated with the proposed regulation are presented below. Although climate change considerations are beyond the scope of the OHRV emissions inventory model, a brief discussion of the direction of climate change impact associated with this regulatory proposal is also included. Also provided is a brief discussion of the co-benefits associated with reduced exposure to air toxics, specifically benzene in confined garage spaces.

A. ROG EMISSIONS REDUCTIONS IN SUPPORT OF OZONE ABATEMENT

Ozone is the criteria pollutant that motivates this regulatory proposal, which will yield substantial emissions reductions of ROG. These emissions reductions help fulfill commitments associated with the 2007 SIP and are necessary to meet the 8-hour ozone standard in California's two extreme non-attainment areas, namely the air basins for SJVAPCD and SCAQMD. ROG emissions reductions associated with the proposed regulation are also necessary, in whole or in part, for attainment of the 8-hour federal ozone standard for Ventura, Sacramento, and other areas downwind of major urban centers.

This regulatory proposal is expected to yield substantial statewide and select regional summertime ROG emissions reductions as shown in Table IV-1, which presents expected emissions reductions in key attainment years identified in the 2007 SIP as well as in the year 2035. Due to an OHRV's longer-than-expected lifetime, benefits from this regulation accrue further into the future than time horizons planned for in the 2007 SIP. Table IV-1 shows that the expected statewide emission reductions from the baseline summertime evaporative ROG emissions from OHRVs to be 10.7 percent in 2020, 25.8 percent in 2023, and 65.5 percent in 2035, when the fleet is 70 percent controlled. This degree of control will significantly reduce the overall ROG emissions from OHRV as evaporative emissions account for approximately three-quarters of the ROG emissions from the current fleet of vehicles.

Table IV-1: Summertime Evaporative ROG Reductions Expected from the Regulatory Proposal in TPD, for Key Attainment Years and Regions in California.

2020	Baseline	Proposed Rule	Benefit	Reduction
Statewide	12.50	11.16	1.34	10.7%
SJVAPCD	2.03	1.81	0.22	10.8%
SCAQMD	3.86	3.48	0.38	9.8%
2023	Baseline	Proposed Rule	Benefit	Reduction
Statewide	13.00	9.65	3.35	25.8%
SJVAPCD	2.12	1.57	0.55	25.9%
SCAQMD	4.02	3.05	0.97	24.1%
2035	Baseline	Proposed Rule	Benefit	Reduction
Statewide	15.12	5.21	9.91	65.5%
SJVAPCD	2.46	0.85	1.61	65.4%
SCAQMD	4.70	1.71	2.99	63.6%

The magnitude in TPD of emissions reductions is less than those envisioned based on the 2007 inventory estimates. The lower emissions reduction estimate is due to the fact that the inventory of ROG emissions from this category is, in part due to the 2008 economic recession, less than anticipated. Thus, while the degree of control of this category is as strong as originally envisioned, the size of the problem, and thus the aggregate benefit associated with control, is somewhat less.

B. CLIMATE CHANGE CONSIDERATIONS

Although the focus of the proposed diurnal emission standard is a criteria air pollutant (ROG), this standard is also expected to have a slight benefit in reducing emissions of climate change pollutants in California.

1. Reduced Fuel Consumption

Evaporative emissions account for a small fraction of the fuel consumed by OHRVs. The decrease in OHRV evaporative emissions associated with the regulatory proposal will reduce OHRV fuel consumption by over two percent, and thus greenhouse gas emissions, by a small amount.

A more substantial effect that would reduce climate change emissions could result from reduced in-use fuel consumption associated with technology shifting. One means by which manufacturers are expected to comply with the proposed regulation is through shifting from carburetor to fuel injection technology. Since fuel injection engines tend to be substantially more fuel-efficient, the shift away from carburetor technology could yield substantial benefits in terms of reduced fuel consumption and therefore emissions of carbon dioxide.

2. *Indirect Warming Impacts*

This regulatory proposal is also expected to exert small, indirect climate change impacts through its effects on the burden of climate forcing pollutants in the atmosphere. Since ROG emitted into the atmosphere is oxidized within a relatively short timeframe, it exerts substantial climate impacts through its effects on atmospheric chemistry (Collins et al., 2002). These indirect impacts are mediated through changes in the concentrations of tropospheric methane, CH_4, and tropospheric ozone, O_3. For example, curtailment of tropospheric ozone associated with ROG emissions reductions is a climate benefit, since tropospheric ozone is currently associated with radiative forcing of approximately 0.39 Watts per square meter, W/m^2 (Shindell et al., 2005). Similarly, ROG perturbs atmospheric chemistry such that methane has a longer atmospheric lifetime. Since methane is the second most-important of the relatively long-lived greenhouse gases tabulated by the Intergovernmental Panel on Climate Change (2007) in terms of radiative forcing, averting ROG emissions and the associated impacts on methane's atmospheric lifetime constitute a climate benefit.

C. REDUCTION OF EXPOSURE TO TOXIC EMISSIONS

One of the expected co-benefits of the proposed regulation is reduced exposure to toxic air pollutants, specifically benzene, which makes up about 1 percent of current blends of gasoline. More than 80 percent of the evaporative emissions from the current fleet of OHRVs in California are produced during diurnal processes, or more specifically when these OHRVs are stored, oftentimes in enclosed garages for periods of a week or more. During these extended storage events, gasoline vapors, including benzene, can build up significantly. The concentration of benzene in a garage is dependent on the air exchange rate of the garage and the emission rate. The concentration of benzene in a garage can be over two orders of magnitude higher than the ambient level with the garage door closed. These elevated benzene levels may pose a health risk to individuals in the garage or to residents of homes with attached garages. OHRVs equipped with evaporative controls compliant with the proposed emission standards; will reduce not only total TOG emissions, but also benzene, significantly.

V. ENVIRONMENTAL IMPACTS ANALYSIS

A. INTRODUCTION

This chapter provides an environmental analysis for the proposed adoption of evaporative emission control requirements for OHRVs. Staff has determined that implementation of the proposed regulation would not result in any potentially significant adverse impacts on the environment. This analysis provides the basis for reaching this conclusion. This section of the ISOR also discusses environmental benefits expected from implementing the proposed regulation.

B. ENVIRONMENTAL REVIEW PROCESS

ARB is the lead agency for this regulatory proposal and has prepared this environmental analysis pursuant to its regulatory program certified by the Secretary of the Natural Resources Agency (Cal. Code Regs., tit.14, § 15251(d); Cal. Code Regs., tit.17, § 60005-60007). In accordance with Public Resources Code Section 21080.5 of the California Environmental Quality Act (CEQA), public agencies with certified regulatory programs are exempt from the requirements for preparing environmental impact reports, negative declarations, and initial studies (Cal. Code Regs., tit.14, §15250). As required by ARB's certified regulatory program, and the policy and substantive requirements of CEQA, ARB has prepared as part of this ISOR, an assessment of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulation and a succinct analysis of those impacts (Cal. Code Regs., tit.17, § 60005(b)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for assessing the potential for significant impacts (Cal. Code Regs., tit.17, § 60005(b)).

If comments received during the public review period raise significant environmental issues, staff will summarize and respond to the comments in writing. The written responses will be included in the Final Statement of Reasons for the regulation. Prior to taking final action on any proposed action for which significant environmental issues have been raised, the decision maker shall approve the written responses to these issues (Cal. Code Regs., tit.17, § 60007(a)). If the proposed regulation is adopted, a Notice of Decision will be posted on ARB's website and filed with the Secretary of the Natural Resources Agency for public inspection (Cal. Code Regs., tit.17, §60007(b)).

C. PRIOR ENVIRONMENTAL ANALYSIS

In 1994, the Board adopted the first exhaust emissions standards for OHRVs, including off-road motorcycles and ATVs, which were previously not subject to any emissions control requirements. The regulation adopted in 1994, as well as several Board approved revisions, are discussed in Section I (D) of this ISOR. The Staff Reports for the original exhaust regulation and its subsequent revisions adopted by the Board identified the potential for a slight increase in NO_x, due to leaner calibrations and a shift from two-stroke to four-stroke technology, which was determined to be insignificant. They also identified potential for a small increases in toxics, ambient particulate matter (PM) and emissions in attainment areas, which were determined to be unavoidable, but less than significant. The previous Staff Reports identified no other adverse environmental impacts.

In 2006, the Board adopted amendments to the OHRV regulation which included harmonizing with evaporative emissions standards adopted by U.S. EPA in 2002. The staff report identified air quality benefits due to the reduction of evaporative emission. The evaporative emissions standards identified no adverse environmental.

D. PROPOSED REGULATION

1. Description

The proposed regulatory provisions are described in detail in Section III (A) of this Staff Report. Briefly, the regulatory proposal includes the following:

- Expands control of evaporative emissions from OHRVs to include a stringent diurnal standard as well as a "tip test" to address potential fuel spillage on all vehicle modes;
- Provisions for certification, labeling requirements, enforcement, recall, and use restrictions;
- A flexible 4-year phase-in period (MY 2018, 2019, 2020, and 2021) where the manufacturer must show that 75 percent of their new sales are certified for those years; and
- A new test procedure to determine evaporative emissions from OHRVs (TP-933).

2. Methods of Compliance

The proposed regulation introduces OHRV evaporative emission standards to control diurnal and spillage emissions. A variety of technologies are available to help manufacturers meet the proposed amended standards. Staff anticipates that manufacturers will use downsized, proven on-road automobile technology to reduce emissions from OHRVs. A detailed description of the available technologies to meet each proposed emission standard is included in Section II of this Staff Report.

This regulatory proposal accommodates diversity in vehicle type and testing capabilities within the regulated community by offering two diurnal testing options, and a small volume manufacturer design based standard. Additional flexibility is granted by allowing manufacturers to certify using advanced fuel system credits. Manufacturers may produce OHRVs both above and below diurnal emission standards so long as no single evaporative family exceeds three times the diurnal standard; provided that all yearly fleet credits and debits are equal to or below zero at the end of each model year. Corporate fleet averaging can encourage manufacturers to produce more zero-emission OHRVs and thus increase available zero-emission technology.

E. ENVIRONMENTAL IMPACTS

1. Beneficial Impacts

The proposed regulatory provisions would curtail ROG emissions released into the atmosphere, resulting in improved air quality that will help California meet the federal 8-hour air quality standard for ozone. Additionally, the proposed regulation would result in reduced exposure to benzene, a toxic air contaminant. Due to reduced fuel consumption as well as ROG emissions reductions, climate co-benefits are also anticipated. These air quality benefits are detailed in Section IV.

2. Resource Areas with No Impacts

Based on ARB's review of the regulatory proposal, staff concludes that the regulatory proposal would not have a significant adverse impact on the environment. Compliance with the proposed regulatory provisions would not result in any physical change to the existing environment. The proposed regulatory provisions will reduce evaporative emissions from OHRVs by setting emission standards that are easily met by incorporating currently available technologies during vehicle construction. Thus, the regulatory proposal would not involve or result in any physical changes to the existing environment, such as new development, modifications to existing buildings or facilities, or new land use designations. ARB staff finds that it is not reasonably foreseeable that there will be any adverse impacts on aesthetics, air quality, agricultural and forestry resources, biological resources, cultural resources, geology and soils, greenhouse gases, hazardous materials, hydrology and water quality, land use planning, mineral resources, noise, population and housing, public services, recreation, or traffic and transportation. The proposed regulatory provisions would not require any action by regulated parties that could affect these resources.

No discussion of alternatives or mitigation measures to address significant adverse environmental impacts is necessary because no significant adverse environmental impacts would result from implementation of the regulatory proposal. This is because the regulatory provisions merely propose emission standards to reduce diurnal and spillage emissions from OHRVs, which would be easily accomplished by using already existing technologies.

VI. ENVIRONMENTAL JUSTICE

California Government Code (Section 65040.12(e)) defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. ARB is committed to supporting the achievement of environmental justice. In 2001, the Board adopted a framework for incorporating environmental justice into the ARB's programs consistent with the directives of State law (ARB, 2001). Although ARB's environmental justice policies apply to all communities in California, they recognize that environmental justice issues have been raised more often in the context of low-income and minority communities.

As a result of ARB's work with the public, the business sector, local government, and air districts, California's ambient air is the cleanest since air quality measurements have been recorded (ARB, 2013a). Whereas the Los Angeles Air Basin experienced 148 smog alerts in 1970, by the year 2000, there was not a single smog alert (ARB, 2013b). However, large numbers of Californians live in areas that continue to experience episodes of unhealthy concentrations of ozone and $PM_{2.5}$.

The proposed rulemaking was designed to achieve ROG emissions reductions in support of attainment of the federal 8-hour ozone standard. In particular, the proposed rulemaking supports attainment in the only two areas nationwide whose nonattainment status has been classified as "extreme," namely the SJVAPCD and SCAQMD. Both areas have strong environmental justice groups that have lobbied ARB to take aggressive action in pursuit of ozone attainment to ease air quality-related health burdens on their communities. The air quality impacts of this regulatory proposal promote environmental justice by improving California's air quality is areas that are simultaneously the most adversely affected with respect to ground level ozone and home to many minority and low-income groups.

VII. ECONOMIC IMPACT ANALYSIS

This section analyzes the economic impacts of the regulatory proposal on OHRV manufacturers inside and outside California, individual consumers, and local and state government agencies. At present, there are no major OHRV manufacturers affected by this regulation headquartered in California, therefore all discussions of manufacturer cost in this section is related to facilities located outside of the State. The estimated cost to comply with this regulatory proposal is based on self-reported industry estimates. The increased cost for OHRVs is from higher manufacturing and certification costs, which are expressed both as incremental costs per vehicle and in fixed costs per evaporative family. Large volume manufacturers, which account for nearly 86 percent of California's annual OHRV sales (see Attachment D), can spread the evaporative control implementation costs across many OHRVs to cost-effectively, comply with this regulatory proposal.

A potential outcome of this regulatory proposal is that OHRV models with low sales volumes may be adversely impacted, resulting in a disproportionate price increase for their model offerings or decreased model availability in California. To mitigate this, a small volume evaporative emission design standard is proposed in the regulation, to provide further flexibility for manufacturers that produce fewer than 50 new OHRVs per MY. Consumers will have similar types of OHRVs available. However, they may have fewer options within a given OHRV class if manufacturers are unable to consolidate low volume models into higher volume evaporative families. In a situation where a specialized OHRV is no longer available, a consumer could have a custom OHRV built using the small volume design standard.

Despite the current reduction in OHRV sales due to the state of the economy, projected OHRV sales are expected to move towards pre-recession levels before MY 2018 (see Attachment C). Over the longer term, OHRV sales are expected to rebound as the economy continues to improve and disposable income increases. Staff remained sensitive to this topic by working closely with industry to develop a regulatory proposal with cost-effective evaporative emission reductions. The average cost to comply with this regulatory proposal ranges from $216 to $465 per OHRV, or a 4 to 9 percent increase (based on an OHRV costing $5,000), across all OHRV evaporative families. All the cost data used to calculate the cost of this regulation was self-reported by industry. Over time the cost of compliance is expected to decline as manufacturers develop more innovative solutions to meet the evaporative emission standards, and as scaled down evaporative components are more widely produced. Additionally, staff has developed the proposed regulations and test procedures with support from major manufacturers that produce vehicles for the on-road motorcycle industry. Future implementation of similar requirements for on-road motorcycles would further reduce the cost of compliance for OHRV manufacturers.

A. LEGAL REQUIREMENTS

Section 11346.3 of the California Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the regulatory proposal on California jobs; business expansion, elimination or creation; and the ability of California business to compete with business in other states.

State agencies are also required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate is to include any non-discretionary cost or savings to the local agencies and the cost or savings in federal funding to the State.

The determinations made by the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses to comply with the proposed regulatory action are presented in the following sections.

B. ESTIMATED COSTS OF THE PROPOSED REGULATORY ACTION

The proposed rulemaking reflects several years of active collaboration between ARB staff and industry stakeholders to collectively agree upon proposed emissions standards that maximize emission reductions while avoiding unnecessary costs. On January 22, 2013, a cost survey was sent out to manufacturers to determine the incremental and fixed costs associated with implementation of the regulatory proposal. Staff received responses from four OHRV manufacturers representing approximately 50 percent of the total California market share. The respondents represented large and small manufacturers. After careful review and clarification of cost data and responses, staff omitted data for eight of the OHRV evaporative families received because projected sales and manufacturer information was not included. Based on survey responses, staff sought to reduce the cost of compliance by streamlining certification testing. Hot soak and running loss standards were removed from the proposal. The test procedure was revised to require running loss and hot soak events as preparation cycles. In spite of the procedural change, the emissions reductions remained the same but the certification costs were reduced. A second survey was sent out on April 18, 2013, to update vehicle cost information. Only one response was received from industry, and was used to replace the manufacturer's previous cost numbers. All the costs used to calculate costs for the regulatory proposal are industry supplied and self-reported. The cost associated with the warranty requirement of this regulatory proposal are estimated to be small as discussed in attachment D. Data from the surveys were used to generate cost values used in this document (see Attachment D).

The total incremental and fixed costs per evaporative family are used to summarize the total additional OHRV cost per vehicle, as shown in Figure VII-1.

The wide range of this data is explained by the high cost of compliance for evaporative families with very few OHRV sales in California per year. The "high estimate", "low estimate", and "average estimate" are based on the cost numbers received from manufacturers for each evaporative family.

Figure VII-1: Summary of OHRV Cost per Vehicle per Evaporative Family

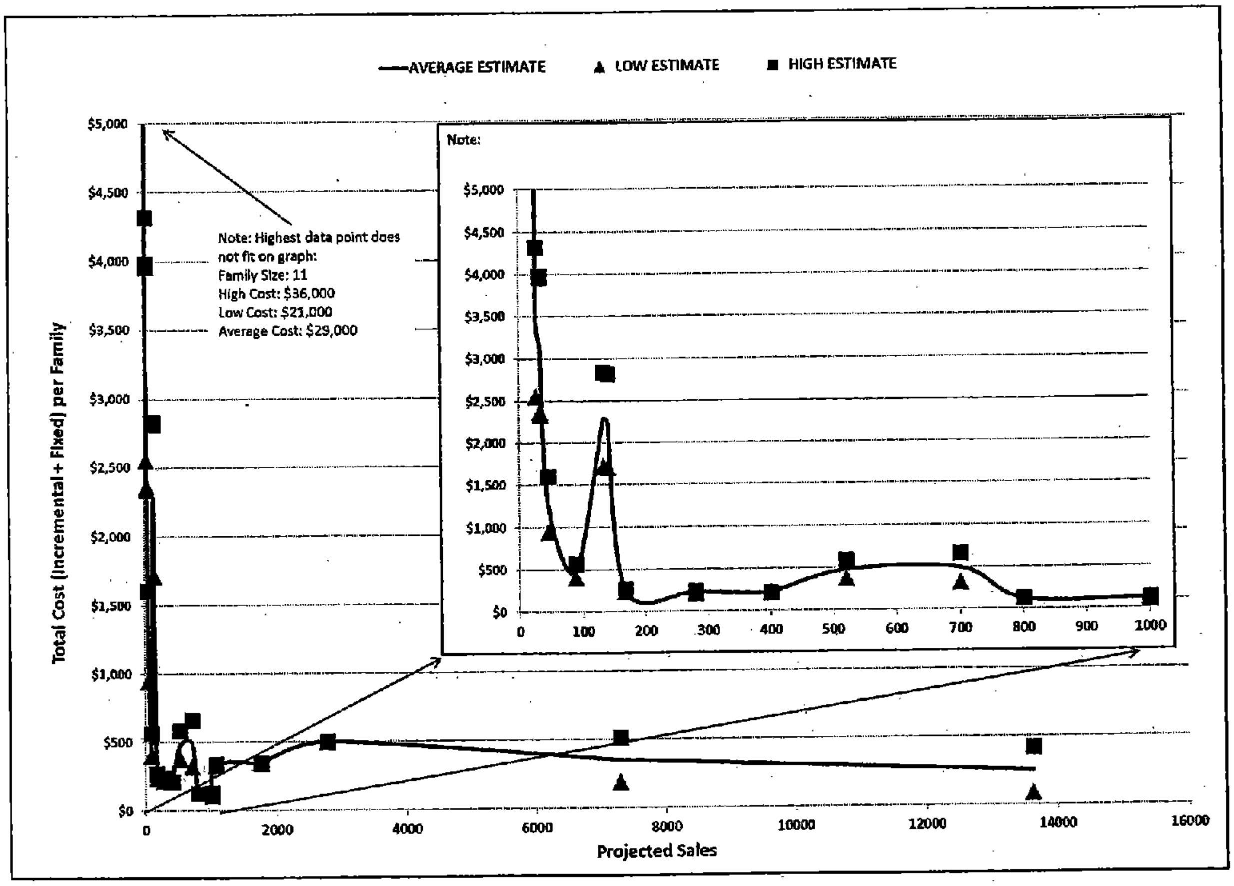
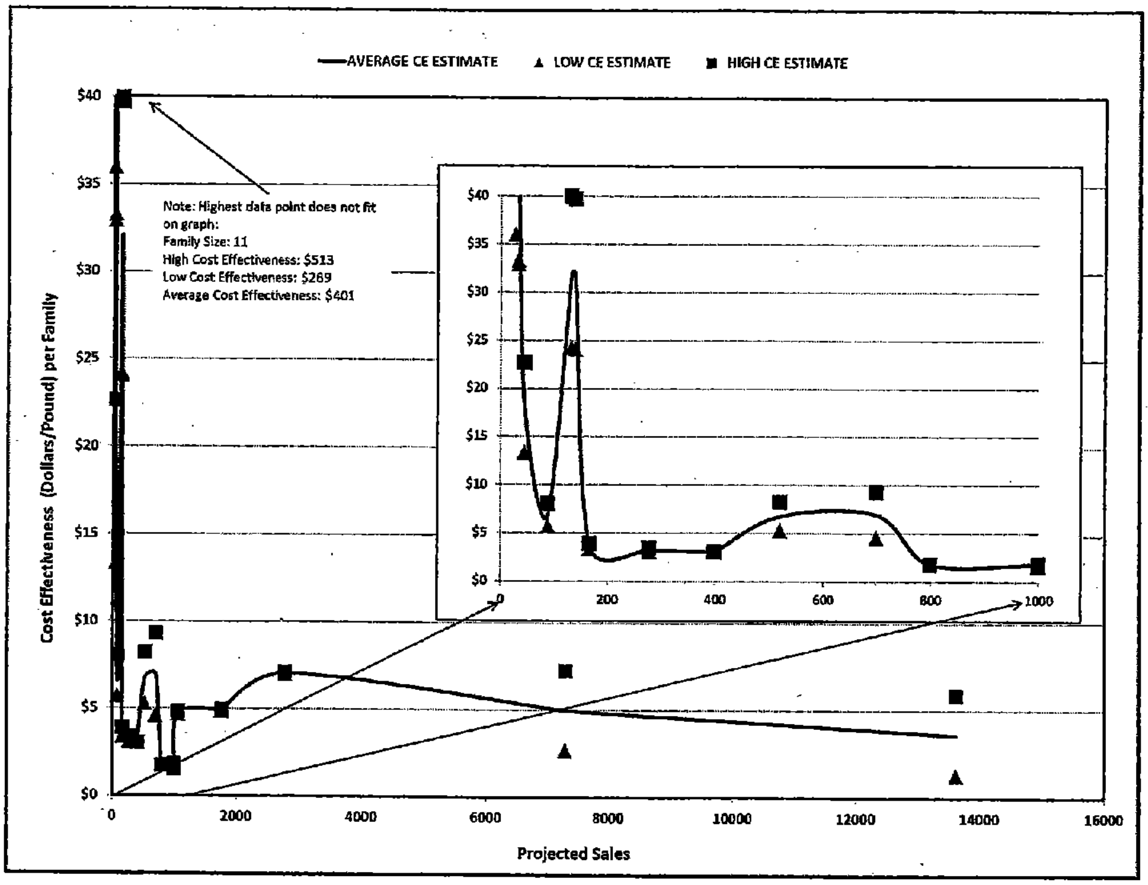


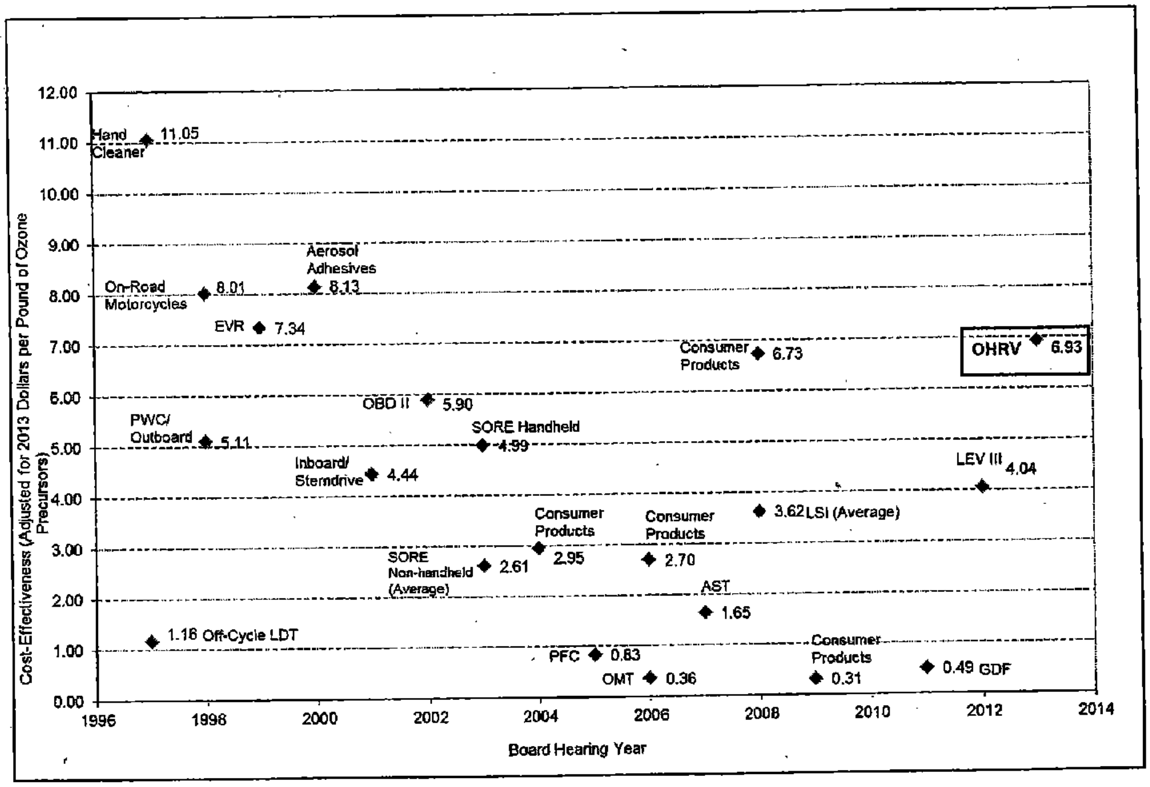
Figure VII-2 shows a summary of OHRV cost per pound per evaporative family based on the results of ARB's cost survey. The graph shows that the evaporative family cost decreases as projected sales increase.

Figure VII-2 Summary of Cost-Effectiveness per Vehicle



The total cost of the regulation, based on the methodology detailed in Attachment D, ranges from $90 million to $215 million over 21 years. The cost-effectiveness of the regulatory proposal in terms of ROG emissions reductions is $6.93/lb., which falls within the range of previous regulations. The cost-effectiveness of this proposal is lower than the inflation adjusted cost of 8.01 $/lb. for the on-road motorcycle exhaust regulation adopted in 1998. Figure VII-3 compares the cost per pound of this regulatory proposal to the cost from other regulations adopted by the Board. Historic cost-effectiveness values are adjusted to 2013 dollars from the year of adoption.

Figure VII-3: OHRV Cost-Effectiveness Compared to Similar Regulations



The cost of compliance is calculated based on the incremental cost for control technology components, and the annualized per-OHRV costs associated with fixed costs such as redesign, testing, and certification. It is assumed that the first four years of implementation follow a vehicle phase-in schedule of 50 percent in 2018, 75 percent in 2019, 75 percent in 2020, and 100 percent in 2021. Manufacturers are given the flexibility to adjust the phase-in schedule to best fit their needs, so long as 75 percent of the MY 2018-2021 OHRVs have controls and all evaporative controls are fully implemented for 2022 and subsequent MYs.

C. POTENTIAL IMPACT ON BUSINESSES, BUSINESS COMPETITIVENESS, EMPLOYMENT, AND BUSINESS CREATION, ELIMINATION, OR EXPANSION

1. Potential Impact on Businesses

Staff verified that there are no major OHRV manufacturers located in California, and that those listed as manufacturing locations are actually large manufacturer vehicle distribution facilities. California's OHRV manufacturing population consists of a few small volume spark ignition sand car manufacturers that meet small business criteria. These manufacturers already purchase ARB compliant engines and fuel management packages, and if promulgated, staff anticipate that they will also purchase ARB certified fuel storage systems in order to comply with the proposed evaporative emission standards. Given their low annual production volumes (50 or less), California's sand car manufacturers are expected to qualify for the small volume OHRV manufacturer design-based standard. As such, the typical small business in California will not find it necessary to assume costs associated with certification and redesign as long as they purchase ARB certified components. Annual reporting and incremental component costs are estimated to be the only impacts to small business. The cost of this regulatory proposal, if added to a sand car, is expected to be virtually indistinguishable within the overall price of these typically expensive vehicles.

Most OHRV manufacturers sell their products through distributors and dealerships, most of which are independently owned and carry OHRVs from multiple manufacturers. This regulatory proposal will have some indirect impact, although not significant, on small businesses that buy and sell OHRVs. During the initial years of implementation, the increased cost of OHRVs may lead to a slight drop in demand that could result in lower profits. The retailer would carry unsold stock over to the next year, possibly incurring less profit on the sale of these units. However, these impacts have been mitigated by the flexible phase-in schedule of emission controls, the ability for manufacturers to certify OHRVs with credits, and an implementation year that coincides with a steady increase in projected vehicle sales. Manufacturers will incur the costs associated with annual reporting, however the costs are small compared with fixed and technology costs. All manufacturers are required to submit similar annual reports for compliance with the OHRV exhaust emission regulation, therefore, the additional costs associated the evaporative reporting requirements is expected to be minimal.

2. *Potential Impact on Business Competitiveness and Employment*

This regulatory proposal would have no significant impact on the ability of any OHRV manufacturing business to sell outside or within California. Specific to California sales, all OHRV manufacturers are subject to the proposed regulations regardless of where they are manufactured. The California businesses impacted by this regulatory proposal are indirectly affected as they are affiliated businesses such as vehicle dealers, aftermarket parts shops, and excursion companies that rent OHRVs to vacationers. These businesses compete within the State and are generally not subject to competition from out-of-state businesses. Therefore, this regulatory proposal is not expected to impose significant competitive disadvantages on affiliated businesses.

A potential indirect employment impact could be that dealers, distributors, or importers downsize their staff due to a decrease in OHRV sales associated with the increase in costs to control evaporative emissions from OHRVs. However, these losses could be offset by increases from new technology development and demand.

3. *Potential Impact on Business Creation, Elimination, or Expansion*

This regulatory proposal is not expected to have a noticeable impact on any OHRV manufacturers located within California because there are no major OHRV manufacturing facilities located in the state. OHRV sales in California represent only about 10 percent of national sales (MIC, 2012). However, some small businesses operating outside of California may decide to discontinue producing vehicles for the California market due to cost increases, which would result in a decrease in model availability. For the first time, the regulatory proposal allows zero-emission OHRVs to generate advanced fuel system credits. This allowance will provide an incentive for OHRV manufacturers to expand existing zero-emission vehicle production or to begin investing in the technology. Additionally, the several small zero-emission OHRV manufacturing facilities that exist in California may benefit from an increase in demand and market availability.

4. Potential Impact on Consumers

The cost of implementation is expected to be passed down to the consumer and is estimated to result in a 4 to 9 percent cost increase per OHRV (based on an average retail cost of $5,000 per vehicle) (see Attachment D). A retail price increase would be less noticeable for OHRVs that can more readily absorb fixed cost increases, such as OHRVs with high sales volumes or higher priced OHRVs. The end user will save an average of $53 in fuel costs over the life of the vehicle as a result of reduced evaporative emissions. Consumers who purchase OHRVs with fuel injection will also see a reduction in fuel consumption depending on the fuel control tune. There may be fewer options in a particular OHRV segment, but there is expected to be at least one OHRV model available for sale in each significant segment. Segments that are very specialized can be filled with OHRVs certified to meet the small volume manufacturer design standard.

D. POTENTIAL IMPACT TO CALIFORNIA STATE OR LOCAL AGENCIES

Staff anticipates that the regulatory proposal will have little to no adverse impacts on local, state and federal agencies that purchase OHRVs. OHRVs are typically an incidental component of certain public fleets that are used on a fractional basis. Although future OHRV procurement patterns are unknown, staff does not believe that the marginal per unit cost increases imposed by this regulation are significant enough to require budgetary baseline augmentations. With respect to local agencies (cities, counties and school districts), this regulation will not trigger the subvention clauses enumerated in Article 13 B, Section 6 of the State Constitution and Sections 17500 et. seq. of California Government Code. This regulatory proposal applies to all residents generally and equally, and does not represent a new or expanded program for local agencies.

Although this regulatory proposal will have no adverse fiscal impacts on local and federal agencies, there is a small impact to the State. Staff estimates that the ARB will require an additional 2.5 person years (PY) to certify new OHRVs and ensure compliance. Staff recommends that the additional 1.5 PYs associated with certification will be needed in perpetuity starting during the 2016-2017 fiscal year, followed by the 1.0 PY for enforcement starting in fiscal year 2017-2018.

E. ALTERNATIVES

Alternatives to the proposed rulemaking are described in Section III, part B. Economic impacts of these alternatives are considered below.

1. Economic Impacts of Taking No Action

Under this alternative, it is likely that no vehicle manufacturers would voluntarily incorporate additional emission control technology into their designs. A manufacturer that did would be at a competitive disadvantage. No additional direct costs would be imposed on manufacturers or stakeholders. However, no benefits in the form of ROG emissions reductions would be realized. Moreover, failure to meet 2007 SIP commitments could lead to a finding of non-implementation resulting in sanctions under Section 110(m) of the CAA.

2. Economic Impact of Eliminating the Carbon Canister Protection Tip Test

Staff considered industry's request to remove the carbon canister protection tip test from the proposal. However, after consideration and analysis it was retained. Eliminating a carbon canister protection tip test would reduce the redesign costs for manufacturers that must comply with the proposed regulation. However, both ATVs and off-road motorcycles operate at extreme angles and off-road motorcycles tip onto their sides during typical use. Without a carbon canister protection tip test there is no way to verify that the carbon canister is not exposed to liquid fuel during a tip over, which could permanently damage the canister within the first few running events. Adding a carbon canister protection tip test during certification is a proactive means to prevent manufacturers and consumers from bearing the cost of control technology that does not fully control emissions. Poorly designed evaporative emissions control systems could create an enforcement burden, demand re-design to address in-use compliance, and forfeit expected emission reductions.

TP-933 introduces a carbon canister protection tip test that is designed to be inexpensive but effective at verifying protection. In the case where manufacturers would like to use other methods, the test procedure outlines the general guidelines for developing a carbon canister protection test that ensures compliance with the emission standards at full useful life. For further details on estimated vehicle redesign costs see Attachment D.

3. Economic Impact of Separate Standards for Each Mode of Use

A possible alternative to the proposed regulation would be to adopt separate standards for each mode of use: running loss, hot soak, and diurnal. This alternative was proposed during the regulatory development period, but it was withdrawn due to the added regulatory complexity, which provided little or no emissions benefit. Originally this regulatory proposal required all OHRVs to measure emissions from each usage mode in a SHED enclosure. The vehicle could certify to emission standards by comparing test data to a variety of standard options. The additional flexibility of multiple standards for each test would have made the record keeping of credit calculations unnecessarily complicated and time-consuming for both manufacturers and ARB. Furthermore, the need for additional variable volume SHED enclosures to perform all three of these tests on each vehicle family would place an unnecessary financial burden on manufacturers. The proposed rulemaking reduces SHED testing to only one test per vehicle, which substantially cuts manufacturers' testing costs.

VIII. SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION

The proposed changes address the 2007 SIP commitments for comprehensive OHRV evaporative emissions reductions. The purpose and implications of each section of the proposed regulation order are explained below. The Proposed Regulation Order (Attachment A) presents the full text of proposed changes, which comprise the adoption of Cal. Code Regs., tit.13, § 2416-2419.5.

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, § 2416 - APPLICABILITY

Section 2416 states that MY 2018 and later OHRVs that are sold or offered for sale in California must meet the evaporative emissions requirements of this regulation. OHRVs excluded from this regulatory proposal include electric golf carts, zero-emissions OHRVs (apart from OHRVs used to generate emission credits), snowmobiles, and diesel-powered OHRVs.

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, §2417 - DEFINITIONS

This section incorporates definitions previously set forth (Cal. Code Regs., tit.13, § 1900(b)) with several additional of terms needed to support the proposed regulatory language.

The following definitions are added in addition to references to existing definitions:

(1) The definition of "Conventional Tool" is being added to reduce end-user tampering with the evaporative emission control system by requiring that common tools are not used to secure visible evaporative system components.
(2) The definition of "Diurnal Emissions" is being added to clarify evaporative emissions produced when the vehicle is subject to the specific 24-hour temperature profile indicated in associated test procedures.
(3) A definition for "Fuel Injection" is being added to clarify the type of technology required by the small volume manufacturer design standard.
(4) A definition for "Off-Highway Recreational Vehicle (OHRV)" is being amended so it includes any vehicle powered by an OHRV engine.
(5) A definition for "Off-Highway Recreational (OHRV) Certification Value" has been added to clarify the emissions value measured during testing that is used to certify a specific evaporative family. An OHVR certification value that is different than the applicable emission standard will result in the generation or deficit of evaporative emission credits, as applicable.
(6) A definition for "Permeation emissions" or "Permeation" is being added to clarify emissions due to diffusion through fuel system components.
(7) A definition for "SAE J1737", is being added to incorporate the test procedure for certifying fuel hoses for the design-based standard by reference and include the title: *Test Procedure to Determine the Hydrocarbon Losses from Fuel Tubes, Hoses, Fittings, and Fuel Line Assembly by Recirculation*, revised November 2004 (SAE, 2004).

(8) A definition for "Small Volume Off-Highway Recreational Vehicle (OHRV) Manufacturer" is being added to limit the exemption to vehicle manufacturer that sell less than or equal to 50 new OHRVs per MY, on average for three years.
(9) A definition for "Tampering" is being added to clarify tampering vs. tamper which for this regulation will mean the same thing.
(10) A definition for "Total Organic Gases" or "TOG" is being added to clarify all gases containing carbon, except carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which are not required to be measured by the diurnal emission standards.
(11) A definition for "Vehicle Identification Number (VIN)" is being added as to clarify the alphanumeric code assigned by a manufacturer to identify a specific OHRV.
(12) A definition for "TP-902" is being added to incorporate the test procedure for certifying carbon canister for the design-based standard by reference and include the title: *Test Procedure for Determining Diurnal Evaporative Emissions from Small Off-Road Engines*, adopted July 26, 2004, which is incorporated by reference herein (ARB, 2004).
(13) A definition for "TP-933" is being added incorporate the test procedure by reference and include the title: *Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles*, adopted [adoption date].

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, §2418 - EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES

Section 2418(a) specifies that TP-933 must be used to measure the emissions detailed in Table 1 of this section. To offer flexibility to manufacturers, the regulation offers two test options by which an OHRV can meet evaporative emissions standards.

Table 1 presents the two test options for evaporative emission standards. Both test options include a 1 g TOG/day diurnal emission standard and a zero liquid leakage allowance during a fuel system leakage tip test. The "72-Hour Diurnal Standard" option requires three 24-hour diurnal SHED tests to directly measure vehicle emissions per day. The "Steady State Diurnal Standard" requires a 24-hour SHED test to demonstrate control of permeation emissions and proper evaporative system construction, in addition to vented emission calculations (evaluated and approved by Dr. Reddy of Evaporative Emissions Consulting, Inc.) to show compliance with the standard. Manufacturers that choose to certify OHRVs using the "Steady State Diurnal Standard" are permitted to use a pressurized fuel system with a relief pressure of 2 pounds per square inch gauge.

To maximize emissions control from refueling, ATVs with fuel tanks over 3.5 gallons that are redesigned to be geometrically different after MY 2017, must meet the same fuel tank sealing surface specifications as on-road vehicles (International Standards Organization <u>13331:1995(E)</u>).

Section 2418(b) allows manufacturers who sell less than 50 OHRVs in California for an average of three years, to certify using a design-based standard with prescriptive technology. The intent of this section is to mitigate per-vehicle certification testing costs. As shown in Table 2, required control technology for small volume manufacturers includes low permeation fuel hoses, carbon canisters, and fuel injection. The fuel tank permeation standard remains unchanged from the current federal standard.

Section 2418(c) specifies the test procedures required for certification testing to comply with the required standards.

Section 2418(d) describes the phase-in schedule for OHRV manufacturers to meet the proposed evaporative standards. The phase-in provides flexibility over a four-year timeframe as long as the average compliance of the total California OHRV fleet over this time period is greater than or equal to 75 percent.

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, § 2419.1 - EVAPORATIVE EMISSION CONTROL LABELS

All OHRV manufacturers subject to this regulation must attach an evaporative emissions label that provides the requisite information for proper vehicle identification and maintenance. To eliminate duplicative language, OHRVs that are certified to both exhaust and evaporative emissions standards are permitted to use an integrated emissions label. All requirements for the exhaust emission label remain as specified in Cal. Code Regs., tit.17, §2413. This section describes the evaporative labeling requirements.

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, § 2419.2 - DEFECTS WARRANTY REQUIREMENTS FOR EVAPORATIVE EMISSION SYSTEMS OF 2018 AND SUBSEQUENT MODEL OFF-HIGHWAY RECREATIONAL VEHICLES

All OHRV manufacturers subject to the proposed regulation must warranty their "high priced" evaporative emissions components including labor for 60 months, 5000 miles, or 500 hours, whichever comes first, from the date of final sale to the end user. Any part which costs $200, adjusted for inflation, or more is considered "high priced". All other evaporative components must have a warranty of 30 months, or 2500 miles, or 250 hours, whichever comes first. The warranty covers all parts not scheduled for replacement as required by the Air Resources Board "Emissions Warranty Parts List" dated December 14, 1978, as amended on February 22, 1985. Parts scheduled for replacement as required maintenance in the written instructions are warrantied for the period of time prior to the first scheduled replacement point for that part. Each manufacturer must provide written instructions for the maintenance and use of the vehicle by the owner and a list of warranted parts installed on that vehicle or engine. The only warranty exclusion is if the manufacturer can demonstrate that the vehicle was abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the part.

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, §2419.3 - EVAPORATIVE EMISSIONS CONTROL SYSTEM WARRANTY STATEMENT

The manufacturer must provide a copy of the warranty statement for all OHRVs sold in compliance with this regulation in California. The warranty statement is a general description of the obligations and rights of the vehicle manufacturer and owner as they relate to this regulation. The format of the statement shall follow the outline below.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

- YOUR WARRANTY RIGHTS AND OBLIGATIONS
- MANUFACTURER'S WARRANTY COVERAGE
- OWNER'S WARRANTY RESPONSIBILITIES

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, §2419.4 - NEW OFF-HIGHWAY RECREATIONAL VEHICLE ENGINE EVAPORATIVE EMISSION STANDARDS, ENFORCEMENT AND RECALL PROVISIONS, WARRANTY, QUALITY AUDIT, AND NEW ENGINE TESTING

All OHRVs subject to this regulation must follow the same vehicle emission-related recall procedures that have been used for light-duty vehicles since 1982.

PROPOSED ADOPTION OF CAL. CODE REGS., TIT.13, § 2419.5 - EVAPORATIVE SYSTEM TESTING AND CERTIFICATION REQUIREMENTS

Section 2419.5(a) states that manufacturers must meet all other applicable codes and regulations.

Section 2419.5(b) outlines the requirements for manufacturers to certify OHRVs to the emission standards in 2418(a) or the OHRV small volume manufacturer design-based standards in 2418(b). Manufacturers must obtain an Executive Order of Certification from ARB for any OHRV offered for sale in California. Manufacturers that certify to the emission standards must supply data showing test results at or below the standard, generated in compliance with the regulation using TP-933 or another approved test procedure.

A small-volume manufacturer can choose to certify using the evaporative design-based standards of section 2418(b). The application for design-based certification must include test results showing compliance for each component used or reference an Executive Order that documents compliance. Component certification can be done by following the requirements of Section 2767.1 of the SORE evaporative regulation

Section 2419.5(c) specifies how manufacturers can use advanced fuel system credits to certify their fleet, where credits are generated based on certification values or zero-emission vehicle credits; credits can only be applied within the MY they were generated and can not to be sold or traded; eligible zero-emission OHRVs are awarded a 0.75 g/day TOG credit per OHRV; and no single family of OHRVs can have a certification value over 300 percent of the standard. Manufacturers must certify zero-emission OHRVs to generate evaporative emission credits. To certify a zero-emission vehicle evaporative family, a manufacturer only needs to comply with administrative requirements. Zero-emission golf carts are not eligible for credits because their gasoline-powered counterparts are regulated under SORE provisions.

Manufacturers may use credits to certify OHRVs that exceed evaporative emission standards. Manufacturers certifying evaporative families using credits must submit calculations detailing their annual production plans and certification test results, and they must submit their actual sales data at the end of each MY. If a shortfall of credits is documented, based on final sales, all OHRVs sold under that Executive Order of Certification will be considered non-compliant. Manufacturers that participate in the advanced fuel system credits program must follow the administrative and final reporting requirements of Section 2419.5(d).

Section 2419.5(d) describes the administrative requirements manufacturers must follow, as required by an Executive Order of Certification. An OHRV manufacturer is responsible for establishing, maintaining, and retaining records for each evaporative family for a minimum of eight years including vehicle identification data, projected sales, actual sales, and certification test results. Additionally, manufacturer calculations associated with vehicle phase-in and advanced fuel system credits must be included in the evaporative family records. Actual sales volumes are defined as shipments to distributors of products intended for sale in California.

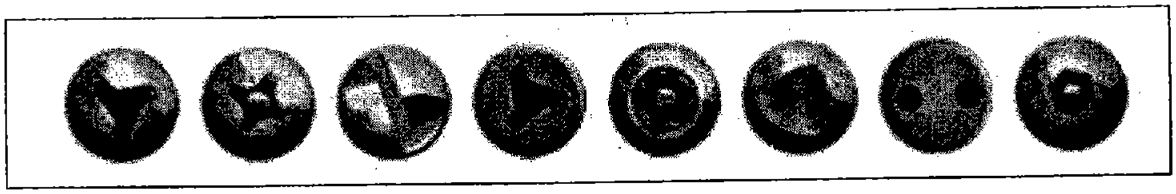
Section 2419.5(e) requires manufacturers to submit final reports within 90 days of the end of a MY. The final reports must include projected sales volumes, actual sales volumes, and certification values. Additional requirements for compliance demonstrations by calculation apply for manufacturers that participate in the vehicle phase-in period or advanced fuel system credits.

Section 2419.5(f) specifies evaporative testing requirements including compliance test procedures and notification of failure.

Section 2419.5(g) expresses the terms and conditions for suspension or revocation of an Executive Order of Certification.

Section 2419.5(h) tamper resistant vehicle design is required by the regulation to discourage end users from removing evaporative emission components from OHRVs. The carbon canister must be installed within the cross-sectional profile of the vehicle, or mounted such that non-conventional tools are required to remove it and the vapor line connections to the canister. Non-conventional tools are defined by the regulation as tools an owner would not have in their tool box, for example the screw types in Figure VIII-1, therefore making removal of the evaporative components more challenging. A vehicle tampering statements is also required as part of the anti-tampering provisions, to educate owners about the legal requirement to maintain the OHRVs emission control system. Manufacturers are encouraged to place the vehicle tampering statement on a tag that will visibly hang from the vehicle prior to sale, to educate both the final purchaser, and all other customers that view the vehicle at the dealership. However, in cases where this is not possible, the tag may be adhered to the front cover of the owner's manual.

Figure VIII-1: Example of Tamper-Resistant Screw Types



Section 2419.5(f) allows staff to periodically inspect OHRV manufacturing facilities. Failure of a manufacturer, distributor, or retailer to allow access for inspection purposes may be grounds for suspension or revocation of an Executive Order of Certification, as stated in subdivision (g).

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Attachment A:
Proposed Regulation Order

Off-Highway Recreational Vehicles: Evaporative Emission Control

Title 13, California Code of Regulations

May 2013

California Air Resources Board

Monitoring and Laboratory Division

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PROPOSED REGULATION ORDER

Chapter 9. Off-Road Vehicles and Engines Pollution Control Devices

Article 3. Off-Highway Recreational Vehicles and Engines

Adopt Article 3, Chapter 9, Division 3, Title 13, California Code of Regulations, to read as follows:

Note: The entire text below is new language proposed to be added to the California Code of Regulations.

§ 2416. Applicability.

(a)(1) This article applies to all new model year 2018 or later off-highway recreational vehicles (OHRV), for sale, lease, use, or offered for sale, lease or use, or otherwise introduced into commerce in California (hereinafter collectively referred to as "sold or offered for sale").

(2) New OHRVs, subject to any of the standards set forth in Article 3, shall be certified by the Air Resources Board and covered by an Executive Order of Certification, pursuant to section 2419.5 of this Article before being sold or offered for sale in California.

(b) The following OHRVs are exempted from the requirements of this regulation:

(1) OHRVs certified solely to operate on diesel fuel,

(2) Snowmobiles, and

(3) Zero emission vehicles; except when optionally certified to generate advanced fuel system credits, pursuant to section 2419.5.

(c) Each part of this article is severable, and in the event that any part of this chapter or article is held to be invalid, the remainder of this article continues in full force and effect.

(d) This article includes provisions for certification, labeling requirements, emissions standard enforcement, recall, and use restrictions.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code. Reference: Sections 43013, 43018, 43105, 43106, 43107, 43204, 43205, 43205.5, 43210, 44004, 44010, 44011, 44012, 44014, 44015 and 44017, Health and Safety Code.

§ 2417. Definitions.

(a) The definitions in Cal. Code Regs., tit.13, § 1900(b), apply as well as the following additions:

(1) "Abuse" as defined in Cal. Code Regs., tit.13, § 2441(a).

(2) "All-Terrain Vehicle (ATV)" as defined in Cal. Code Regs., tit.13, § 2411(a).

(3) "Compliance Testing" as defined in Cal. Code Regs., tit.13, § 2421(a).

(4) "Conventional Tool" is any of the following: a blade or Phillips screwdriver, open-end or box wrench, adjustable wrench, standard hexagonal socket, hands, pliers, or Torx bit.

(5) "Diurnal Emissions" means evaporative emissions resulting from the daily cycling of ambient temperatures and include resting losses, and permeation emissions, as measured according to test procedures incorporated in this Article.

(6) "Emission Control System" as defined in Cal. Code Regs., tit.13, § 2411(a).

(7) "End of the Assembly-Line" as defined in Cal. Code Regs., tit.13, § 2411(a).

(8) "Evaporative Emissions" as defined in Cal. Code Regs., tit.13, § 2752(a).

(9) "Evaporative Family" as defined in Cal. Code Regs., tit.13, § 2752(a).

(10) "Evaporative Family Emissions Limit (EFEL)" is defined as the numerical value selected by the manufacturer to serve in the advanced fuel system credit program. The EFEL serves as the evaporative family's emission standard for emission compliance efforts. If the manufacturer does not declare an EFEL for an evaporative family, the applicable emissions standard must be treated as that evaporative family's EFEL for the purposes of any provision in this Article. In addition, the EFEL must be set in increments of 0.025 grams per test.

(11) "Executive Order of Certification" as defined in Cal. Code Regs., tit.13, § 2752(a).

(12) "Fuel Injection" is defined as any mechanical or electrical fuel system in which pressurized fuel is sprayed or injected, only when the engine is starting or running, into the intake system or cylinder of an internal combustion engine.

(13) "Golf Cart" as defined in Cal. Code Regs., tit.13, § 2411(a).

(14) "Manufacturer" as defined in Cal. Code Regs., tit.13, § 2411(a).

(15) "Nominal Capacity" as defined in Cal. Code Regs., tit. 13, § 2752(a).

(16) "Nonconformity" or "Noncompliance" as defined in Cal. Code Regs., tit.13, § 2112(h).

(17) "Off-Highway Recreational Vehicle (OHRV)" means any vehicle powered by an off-highway recreational vehicle engine

(18) "Off-Highway Recreational Vehicle Engines " or "Engines" as defined in Cal. Code Regs., tit. 13, § 2411(a).

(19) "Off-Road Motorcycle" as defined in Cal. Code Regs., tit. 13, § 2411(a).

(20) "Off-Road Sport Vehicle" as defined in Cal. Code Regs., tit. 13, § 2411(a).

(21) "Off-Road Utility Vehicle" as defined in Cal. Code Regs., tit. 13, § 2411(a).

(22) "Owner" as defined in Cal. Code Regs., tit.13, § 2180.1(a).

(23) "Permeation emissions" or "Permeation" means evaporative emissions that result from reactive organic gas molecules penetrating through the walls of fuel system components and evaporating on outside surfaces. Permeation emissions are a component of diurnal emissions.

(24) "SAE J1737" means Society of Automotive Engineers "Test Procedure to Determine the Hydrocarbon Losses from Fuel Tubes, Hoses, Fittings, and Fuel Line Assemblies by Recirculation," revised November 2004, which is incorporated by reference herein.

(25) "Sand Car" as defined in Cal. Code Regs., tit. 13, § 2411(a).

(26) "Scheduled Maintenance" as defined in Cal. Code Regs., tit.13, § 2411(a).

(27) "Small Volume Off-Highway Recreational Vehicle Manufacturer" means any off-highway recreational vehicle manufacturer with three-year average California sales less than or equal to a total of 50 new off-highway recreational vehicles per model year in California.

(28) "Tampering" means removing, modifying, or disconnecting emissions-related parts, or, as it applies to emission control labels, in a manner that voids equipment certification.

(29) "Total Organic Gases" or "TOG" means all gases containing carbon, except carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.

(30) "Vehicle or Engine Manufacturer" as defined in Cal. Code Regs., tit.13, § 2035(c).

(31) "Warranty Period" as defined in Cal. Code Regs., tit.13, § 2035(c).

(32) "Warranty Station" as defined in Cal. Code Regs., tit.13, § 2035(c).

(33) "Zero Emission Vehicle" or "electric motorcycle" as defined in Cal. Code Regs., tit.13, § 2411(a).

(34) "TP-902" means "Test Procedure for Determining Diurnal Evaporative Emissions from Small Off-Road Engines," adopted July 26, 2004, which is incorporated by reference herein.

(35) "TP-933" means "Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles," adopted [INSERT ADOPTION DATE], which is incorporated by reference herein.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code. Reference: Sections 43013, 43018, 43105, 43106, 43107, 43204, 43205, 43205.5, 43210, 44004, 44010, 44011, 44012, 44014, 44015 and 44017, Health and Safety Code.

§ 2418. Evaporative Emission Standards and Test Procedures.

(a) Manufacturers of OHRVs must comply with the following evaporative emission standards for new OHRVs sold or offered for sale in California.

(1) Evaporative emissions from an OHRV may not exceed the following limitations:

(A) The applicable emission standards outlined in Table 1 for either the 72 hour diurnal standard or the steady state diurnal standard. All OHRVs certified to the emission standards below are presumed to demonstrate compliance with federal permeation standards specified in Cal. Code Regs., tit.13, § 2412(b)(2).

Table 1

<table>
<tr><th>Vehicle and Model Year</th><th>Required Tests</th><th>72-Hour Diurnal Standard[1]</th><th>Steady State Diurnal Standard[2]</th></tr>
<tr><td rowspan="2">OHRVs 2018 and later model years</td><td>Diurnal</td><td>1 gram TOG/day</td><td>1 gram TOG/day</td></tr>
<tr><td>Fuel System Leakage Tip Test</td><td colspan="2">No visible liquid leakage</td></tr>
</table>

(1) Highest 24-hour diurnal test result over three consecutive 24-hour diurnal test periods.
(2) 24-hour diurnal test result plus calculated vented emissions.

(B) All-Terrain Vehicle (ATV) Filler Neck Compatibility Standard.

Beginning with model year 2018, ATVs with fuel tanks that are re-designed to be geometrically different from fuel tanks of 2017 and earlier model years, and have a nominal capacity of greater than 3.5 gallons must meet the filler pipe sealing surface requirements in Figure 1 of the International Standards Organization 13331:1995(E), published June 1, 1995, which is incorporated by reference herein. Perpendicularly down from the mating surface there must be a minimum of 120 mm (90 mm for nozzle, 5 mm for bellows compression and 25 mm for extra space fuel flow) to the bottom of the tank.

(2) Zero emission vehicles shall produce zero fuel evaporative emissions under any and all possible operational modes and conditions, and are therefore not required to perform evaporative emissions testing to certify in accordance with section 2419.5.

(b) Small Volume OHRV Manufacturer Design-Based Standard.

(1) In lieu of certifying to the emission standards in subdivision (a), a small volume OHRV manufacturer may certify OHRVs to the design-based standards set out in Table 2, in addition to performing a tip-test as specified in subsection (a)(1).

Table 2

Effective Date Model Year	*Fuel Tank Permeation Grams/m²/day*	*Fuel Hose Permeation Grams/m²/day*	*Carbon Canister Working Capacity Grams/Liter of Nominal Fuel Tank Volume*	*Fuel Injection*
2018 and later model years	1.5 @ 28°C (82°F)(1)	5.0 @ 35°C (95°F)	1.0(2)	Required

(1) Fuel tank permeation standards specified in Cal. Code Regs., tit.13, § 2412(b)(2).
(2) The carbon canister must be actively purged during engine operation.

(c) The test procedures for determining compliance with the standards in:

(1) subdivision (a) are set forth in TP-933, and incorporated by reference herein.

(2) subdivision (b) for,

(A) fuel hose permeation, are set forth in SAE J1737, and incorporated by reference herein.

(B) fuel tank permeation, are set forth in part 1060.520, Title 40, Code of Federal Regulations, as amended on April 30, 2010, and incorporated by reference herein.

(C) the carbon canister, are set forth in TP-902, and incorporated by reference herein.

(d) Phase-in Schedule.

(1) For model years 2018 through 2021, OHRV manufacturers may phase-in evaporative emission standards specified in subdivision (a) so that 75 percent of all OHRVs sold in model years 2018 through 2021 are compliant with the requirements in section 2419.5.

(2) All 2018 through 2021 model year OHRVs that are not subject to these standards pursuant to the phase-in schedule shall comply with the evaporative permeation requirements for 2008 and later model year OHRVs, as described in Cal. Code Regs., tit.13, § 2412(b)(2).

(3) The percentage of OHRV fleet averaged across model years 2018 through 2021 must be used to determine compliance with this requirement.

(4) For the purpose of calculating the fleet average, a manufacturer shall use the percentage of OHRVs sold or offered for sale in California for model years 2018 through 2021. A manufacturer may calculate this average percentage using the projected sales for these model years in lieu of actual sales.

(5) For the purpose of this section, any OHRV manufacturer that participates in the phase-in period must comply with the administrative requirements in section 2419.5(d).

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code. Reference: Sections 43013, 43018, 43105, 43106, 43107, 43204, 43205, 43205.5, 43210, 44004, 44010, 44011, 44012, 44014, 44015 and 44017, Health and Safety Code.

§ 2419.1 Evaporative Emission Control Labels – New Off-Highway Recreational Vehicles.

(a) Purpose. An evaporative emissions label (or labels) must be affixed to every certified OHRV to provide proper vehicle identification and maintenance information for emissions-related parts. The maintenance information on the label may be omitted if such information is included in the owner's manual.

(b) The manufacturer granted certification is responsible for compliance with this section.

(c) Evaporative Emissions Label Content and Location.

(1) An evaporative emissions label made of a permanent material must be welded, riveted or otherwise permanently attached to an area on the OHRV in such a manner that the label will be readily visible to the average person with the engine installed.

(A) The label must be readable from a distance of 18 inches (46 centimeters) without any obstructions from vehicle or engine parts (including all manufacturer available optional equipment) except for flexible parts (e.g., vacuum hoses, ignition wires) that can be moved out of the way without disconnection.

(B) Specifications to be printed on the label must be no smaller than 8 point type size (2 millimeters in height) .

(2) In selecting an acceptable location, the manufacturer must consider the possibility of accidental damage (e.g., possibility of tools or sharp instruments coming in contact with the label). Each label must be affixed in such a manner that it cannot be removed without destroying or defacing the label, and must not be affixed to any part that is likely to be replaced during the OHRV's useful life.

(3) The evaporative emissions label must be in the English language, and use block letters and numerals, which must be of a color that contrasts with the background color of the label.

(4) The evaporative emissions label must contain the following information:

(A) A label heading that must read: "Vehicle Evaporative Emission Control Information,"

(B) The complete corporate name and trademark of the manufacturer,

(C) Evaporative family name and model name,

(D) Identification of the Evaporative Emission Control System. Abbreviations may be used and must conform to the nomenclature and abbreviations found in the Society of Automotive Engineers' procedure J1930, "Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations and Acronyms," October 2008, which is incorporated by reference herein;

(E) The tune-up specifications and adjustments recommended by the manufacturer. These specifications must indicate the proper transmission position during tune-up and what accessories, if any, should be in operation, and what systems, if any (e.g., vacuum advance, air pump), should be disconnected during the tune-up. Any tune-up specifications or adjustment instructions that appear on labels must be sufficiently clear and complete so as to preclude the need for a mechanic or OHRV owner to consult other references in order to correctly perform the adjustments. The manufacturer must include the single statement: "No other adjustments needed," in lieu of any tune-up adjustment instruction, when the manufacturer does not recommend a tune-up specification or an adjustment;

(F) An unconditional statement of compliance with the appropriate model year California regulations. For example, "This (specify off-road motorcycle, all-terrain vehicle, off-road sport vehicle, off-road utility vehicle, or sand car, as applicable) conforms to California evaporative emissions regulations applicable to (specify applicable model year) model-year new (specify off-road motorcycles, all-terrain vehicles, off-road sport vehicles, off-road utility vehicles, or sand cars, as applicable)." The statement must also include the phrase, "is certified to (specify applicable ROG designated standard in grams per day) evaporative emission standard in California;" and

(G) Statements such as those in (F) must not appear on labels placed on OHRVs that do not comply with all applicable California regulations.

(5) A manufacturer may elect to use a supplemental label when the original label lacks sufficient space to include all the required information. A supplemental label must conform to all of the specifications as the original label. The original label must be indicated as "1 of 2" and the supplemental label must be indicated as "2 of 2" whenever a supplemental label is utilized.

(6) The provisions of this section must not prevent a manufacturer from also reciting on the label that such OHRV comply with any applicable federal emission standards for new OHRVs, or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of such OHRVs.

(7) The labels and any adhesives used must be designed to withstand, for the OHRV's total expected life, typical OHRV environmental conditions at the location where a label has been attached. Typical OHRV environmental conditions include, but are not limited to, exposure to engine fuels, lubricants and coolants (e.g., gasoline, motor oil, brake fluids, ethylene glycol), engine operating temperatures, steam cleaning, and paints or paint solvents. The manufacturer must submit, with its certification application, a statement attesting that its labels comply with this requirement.

(8) Approval of Emission Control Label.

(A) The manufacturer must obtain approval from the Executive Officer for all emission control label formats and locations prior to certification. Approval of the specific tune-up specifications and adjustments is not required; however, the format for all such specifications and adjustments, if any, is subject to review. If the Executive Officer finds that the information on the label is vague or subject to misinterpretation, or that the location does not comply with these specifications, the Executive Officer may require that the label or its location be modified accordingly.

(B) Samples of all actual production emission control labels used within an evaporative family must be submitted to the Executive Officer of the Air Resources Board within thirty days after the start of production.

(C) The Executive Officer may approve alternate label locations or may, upon request and when the Executive Officer determines warranted, waive or modify one or more of the label content requirements, provided that the intent of this section is satisfied.

(D) If the Executive Officer finds any OHRV using emission control labels that are different from those approved or that do not substantially comply with the readability or durability requirements set forth in this section, the Executive Officer may invoke Cal. Code Regs., tit.13, § 2109.

(d) Integrated Emissions Label.

(1) A manufacturer must obtain approval from the Executive Officer, as set forth in subdivision (c)(8), to use an integrated emissions label for OHRVs certified to this article, and subject to exhaust emissions labeling requirements by Cal. Code Regs., tit.13, § 2413(b).

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code. Reference: Sections 43013, 43018, 43105, 43106, 43107, 43204, 43205, 43205.5, 43210, 44004, 44010, 44011, 44012, 44014, 44015 and 44017, Health and Safety Code.

§ 2419.2 Defects Warranty Requirements for Evaporative Emission Systems of 2018 and Later Model Year Off-Highway Recreational Vehicles.

(a) The warranty period shall begin on the date the OHRV is delivered to an ultimate purchaser.

(b) General Emissions Warranty Coverage.

The manufacturer of an OHRV shall warrant to the ultimate purchaser and each subsequent purchaser that the OHRV is:

(1) Designed, built, and equipped so as to conform, at the time of sale, with all applicable laws, rules and regulations; and

(2) Free from defects in materials and workmanship that may cause the failure of a warranted part to be identical in all material respects to that part as described in the OHRV manufacturer's application for certification.

(c) Warranty Period.

The warranty period applicable to this section shall be a period of use of 30 months, or 2500 miles, or 250 hours, whichever comes first, except for "high-priced" warranty parts, which are covered for 60 months, or 5000 miles, or 500 hours, whichever comes first.

(1) Each manufacturer shall identify in its application for certification the "high-priced" warranted parts which are:

(A) OHRV parts included on the Air Resources Board "Emissions Warranty Parts List," as last amended February 22, 1985, which is incorporated herein by reference, and;

(B) Have an individual replacement cost at the time of certification exceeding the cost limit defined in subdivision (c)(3);

(2) The replacement cost shall be the retail cost to an OHRV owner and include the cost of the part, labor, and standard diagnosis. The costs shall be those of the highest-cost metropolitan area of California.

(3) The cost limit shall be calculated using the following equation:

Cost limit_n = \$200 x (CPI_{n-2} / 118.3)

Where,

- Cost limit_n = the cost limit for the applicable model year of the OHRV rounded to the nearest ten dollars
- n = model year of the new OHRVs

- n-2 = calendar year two years prior to the model year of the new OHRVs
- CPI = annual average nationwide urban consumer price index published by the United States Bureau of Labor Statistics

The $200 is based on calendar year 2018 dollars.

(4) The cost limit shall be revised annually by the Executive Officer. The highest-cost metropolitan area in California shall be identified by the Executive Officer for use in this section. If a manufacturer seeks certification of an OHRV before the applicable annual average CPI is available, the cost limit shall be calculated using the average of the monthly nationwide urban CPI figures for the most recent twelve month period for which figures have been published by the United States Bureau of Labor Statistics.

(5) Each manufacturer shall submit to the Executive Officer the documentation used to identify the "high-priced" warranted parts required in this section. The documentation shall include the estimated retail parts costs, labor rates in dollars per hour, and the labor hours necessary to diagnose and replace the parts.

(6) The Executive Officer may reject or require modification of the manufacturer's list of "high-priced" warranted parts to ensure that such list includes all emission-related parts whose replacement cost exceeds the cost limit defined in subdivision (c)(3).

(d) Subject to the conditions and exclusions of subdivision (i), the warranty on emissions-related parts shall function as follows:

(1) Any warranted part which is not scheduled for replacement as part of maintenance in the written instructions pursuant to subdivision (e) shall be warranted for the warranty period defined in subdivision (c). If any such part fails during the warranty period, it shall be repaired or replaced by the OHRV manufacturer according to subdivision (d)(4). Any such part repaired or replaced under warranty shall be fully warranted.

(2) Any warranted part which is scheduled only for regular inspection in the written instructions required by subdivision (e) shall be warranted for the warranty period defined in subdivision (c). A statement in such written instructions to the effect of "repair or replace as necessary" shall not reduce the period of warranty coverage. Any such part repaired or replaced under warranty shall be warranted for the remaining warranty period.

(3) Any warranted part which is scheduled for replacement as part of maintenance in the written instructions pursuant to subdivision (e) shall be warranted for the period of time prior to the first scheduled replacement point

for that part. If the part fails before the first scheduled replacement point, the part shall be repaired or replaced by the OHRV manufacturer according to subdivision (d)(4). Any such part repaired or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

(4) Repair or replacement of any warranted part under the warranty provisions of this article shall be performed at no charge to the OHRV owner, at a warranty station, except in the case of an emergency when a warranted part or a warranty station is not reasonably available to the OHRV owner. In an emergency, repairs may be performed at any available service establishment, or by the owner, using any replacement part. The manufacturer shall reimburse the owner for his or her expenses including diagnostic charges for such emergency repair or replacement, not to exceed the manufacturer's suggested retail price for all warranted parts replaced and labor charges based on the manufacturer's recommended time allowance for the warranty repair and the geographically appropriate hourly labor rate.

(5) Notwithstanding the provisions of subdivision (d)(4), warranty services or repairs shall be provided at all manufacturer dealerships that are owned by the manufacturer or franchised to service the subject OHRVs.

(6) The OHRV owner shall not be charged for diagnostic labor which leads to the determination that a warranted part is, in fact, defective, provided that such diagnostic work is performed at a warranty station.

(7) The OHRV manufacturer shall be liable for damages to other vehicle components proximately caused by a failure, under warranty, of any warranted part.

(8) Throughout the OHRV's warranty period defined in subdivision (c), the OHRV manufacturer shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts. The lack of availability of such parts or the incompleteness of repairs within a reasonable time period, not to exceed 30 days from the time the OHRV is initially presented to the warranty station for repair, shall constitute an emergency for purposes of subdivision (d)(4).

(9) Any replacement part designated by a manufacturer may be used in warranty repairs provided without charge to the OHRV owner. Such use shall not reduce the warranty obligations of the OHRV manufacturer, except that the OHRV manufacturer shall not be liable under this article for repair or replacement of any replacement part which is not a warranted part (except as provided under subdivision (d)(7)).

(10) Any add-on or modified part exempted by the Air Resources Board from the prohibitions of Vehicle Code section 27156 may be used on an OHRV. Such use, in and of itself, shall not be grounds for disallowing a warranty claim made in accordance with this article. The OHRV manufacturer shall not be liable under this article to warrant failures of warranted parts caused by the use of an add-on or modified part unless such parts are also warranted.

(11) Upon a request of the Executive Officer, the OHRV manufacturer must provide any documents that describe the manufacturer's warranty procedures or policies.

(12) Any replacement part must not reduce the effectiveness of the OHRV emission control system. A manufacturer must demonstrate that the applicable emission standards are being met when the replacement part(s) are installed on the OHRV. The demonstration of equivalence to applicable emission standards can be achieved through replacing the part(s) with the evaporative emission components the OHRV emissions family was certified with; or, if unavailable, alternative parts may be installed if the manufacturer can provide testing data to verify the evaporative control system meets, at least, the OHRV EFEL.

(e) Commencing with the 2018 model year, each manufacturer shall furnish with each new OHRV written instructions for the maintenance and use of the OHRV by the owner.

(f) Commencing with 2018 model year, the manufacturer shall furnish with each new OHRV, a list of the warranted parts installed on that vehicle. The list shall include those parts included on the Air Resources Board "Emissions Warranty Parts List," incorporated by reference in subdivision (c)(1)(A).

(g) Each manufacturer shall submit the documents required by subdivisions (e) and (f), with the manufacturer's preliminary application for new OHRV certification for approval by the Executive Officer. The Executive Officer may reject or require modification of the manufacturer's list of warranted parts to ensure that each such list is of proper scope. The Executive Officer may also reject or require modification of any of the documents required by subdivision (e). Approval by the Executive Officer of the documents required by subdivisions (e) and (f), shall be a condition of certification. The Executive Officer must approve or disapprove the documents required by subdivisions (e) and (f), within 90 days of the date such documents are received from the manufacturer or the application is deemed disapproved. If approved, an Executive Order of Certification will be granted by the Executive Officer. If disapproved, an Executive Order of Certification will not be granted by the Executive Officer. A statement of the reasons shall accompany any disapproval. In the event of disapproval, the manufacturer may request a review of the Executive Officers' decision by the Board.

(h) Notwithstanding subdivision (f), the Executive Officer may delete any part from a manufacturer's list of warranted parts provided if the manufacturer demonstrates to the Executive Officer that:

(1) Failure of such part will not increase the emissions of any OHRV on which it is installed, and

(2) Any deterioration of drivability or performance which results from failure of the part could not be corrected by adjustments or modifications to other OHRV components.

(i) Exclusions.

The repair or replacement of any warranted part otherwise eligible for warranty coverage under subdivision (d), shall be excluded from such warranty coverage if the OHRV manufacturer can provide evidence to the Executive Officer, to the Executive Officer's satisfaction, that the OHRV has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the part.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code. Reference: Sections 43013, 43018, 43105, 43106, 43107, 43204, 43205, 43205.5, 43210, 44004, 44010, 44011, 44012, 44014, 44015 and 44017, Health and Safety Code.

§ 2419.3 Evaporative Emissions Control System Warranty Statement.

(a) A manufacturer shall furnish a copy of the following statement with each new 2018 and later model year vehicle, using those portions of the statement applicable to the vehicle, unless otherwise authorized by the Executive Officer. The warranty statement shall generally describe the obligations and rights of vehicle manufacturers and owners under this article.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board (and manufacturer's name, optional) is pleased to explain the emission control system warranty on your (model year) (OHRV). In California, new off-highway recreational vehicles must be designated, built and equipped to meet the State's stringent anti-smog standards. (Manufacturer's name) must warrant the emission control system on your (OHRV) for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your (OHRV).

Your emission control system may include parts such as the carburetor or fuel-injection system, fuel tank, fuel hoses, carbon canister, and engine computer. Also included may be hoses, belts, connectors and other emission-related assemblies. Where a warrantable condition exists, (manufacturer's name) will repair your (OHRV) at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

[For 2018 and later model year OHRVs.]

For 30 months, or 2500 miles, or 250 hours, whichever comes first, except for evaporative components over the OHRV high-priced warranty value, which is covered for 60 months, or 5000 miles, or 500 hours, whichever comes first.

If any emission-related part on your (OHRV) is defective, the part will be repaired or replaced by (manufacturer's name).

OWNER'S WARRANTY RESPONSIBILITIES:

As the (OHRV) owner, you are responsible for the performance of the required maintenance listed in your owner's manual. (Manufacturer's name) recommends that you retain all receipts covering maintenance on your (OHRV), but (manufacturer's name) cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of a scheduled maintenance.

As an owner you are responsible for presenting your (OHRV) to a (manufacturer's name) dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

As an (OHRV) owner, you should also be aware that (manufacturer's name) may deny you warranty coverage if your (OHRV) or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, you should contact (Insert chosen manufacturer's contact) at 1-XXX-XXX-XXXX or the California Air Resources Board at 9528 Telstar Avenue, El Monte, CA 91731.

(b) Each manufacturer shall submit the documents required by the section with the manufacturer's preliminary application for new OHRV certification for approval by the Executive Officer. The Executive Officer may reject or require modification of the documents to the extent the submitted documents do not satisfy the requirements of this section. Approval by the Executive Officer of the documents required by this section shall be a condition of certification. The Executive Officer must approve or disapprove the documents required by this section within 90 days of the date such documents are received from the manufacturer. Any disapproval shall be accompanied by a statement of the reasons therefore. In the event of disapproval, the manufacturer may petition the Board to review the decision of the Executive Officer.

NOTE; Authority cited: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 43106, 43204, 43205, 44004, 44010, 44011, 44012, 44014 and 44015, Health and Safety Code.

§ 2419.4. New Off-Highway Recreational Vehicle Evaporative Emission Standards, Enforcement and Recall Provisions, Warranty, Quality Audit, and New Engine Testing.

Commencing with model year 2018, an OHRV is subject to Cal. Code Regs., tit.13, § 2111-2140, and the incorporated Appendix A, "California In-Use Vehicle Emission-Related Recall Procedures, Enforcement Test Procedures, and Failure Reporting Procedures for 1982 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Engines, and Motorcycles," which are incorporated by reference herein.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code. Reference: Sections 43013, 43018, 43105, 43107, 43205.5 and 43210, Health and Safety Code.

§2419.5 Evaporative System Testing and Certification Requirement.

(a) Requirement to Comply with All Other Applicable Codes and Regulations.

Certification or approval of any equipment or evaporative emission control system by the Executive Officer does not exempt the equipment or evaporative emission control system from compliance with other laws, rules or regulations including state and federal safety codes and regulations.

(b) Certification Requirements.

(1) For model years 2018 and later, OHRVs must be tested with the entire emissions control system as a complete vehicle. To obtain an Executive Order of Certification for OHRVs, a manufacturer must:

(A) Perform OHRV testing in accordance with section 2418(c). Measured emissions must be at or below the applicable emission standards listed section 2418(a), or;

(B) Evaporative families that do not meet the emission standards outlined above must comply by offsetting any shortfall with emissions credits generated with the same model year, as specified in subdivision (c).

(C) Comply with all administrative requirements in subdivision (d).

(D) Meet the applicable warranty requirements of Sections 2419.2 and 2419.3.

(E) Meet the evaporative emissions labeling requirements of Section 2419.1.

(F) Submit an OHRV certification application to the Mobile Source Operations Division (MSOD) Chief, Air Resources Board, electronically as specified by the MSOD Chief.

(G) Within 30 days of receipt of the application, the Executive Officer must determine whether an application is complete.

(H) Within 90 days after an application has been deemed complete, the Executive Officer must approve or disapprove of the required documents. If approved, an Executive Order of Certification will be granted by the Executive Officer. If disapproved, an Executive Order of Certification will not be granted by the Executive Officer. The applicant and the Executive Officer may mutually agree to a longer time for reaching a decision. An applicant may submit additional supporting documentation before a decision has been reached.

(2) In order to facilitate OHRV design certification, ARB will certify emissions-related parts relating to fuel hoses, fuel tanks, and venting control devices to the emission standards in section 2418(b). To obtain an Executive Order of Certification for the design-based evaporative emissions standard, a small volume OHRV manufacturer must:

(A) Have measured emissions at or below the emission standards listed section 2418(b), in accordance with the testing requirements in section 2418(c).

(B) Comply with all administrative requirements in subdivision (d)

(C) Meet the applicable warranty requirements of sections 2419.2 and 2419.3.

(D) Meet the evaporative emissions labeling requirements of section 2419.1.

(E) Complete the installation as directed by the fuel hose, fuel tank, and carbon canister component or other venting component manufacturer and verify adherence to specifications contained within the referenced component Executive Order.

(F) Submit a design-based certification application to the Mobile Source Operations Division Chief, Air Resources Board, electronically as specified by the MSOD Chief.

1. The application must include the approved component Executive Order number or compliant emissions data for the emissions-related parts and any test data required for venting control.

2. Component Executive Orders can be obtained by following the procedures outlined in Cal. Code Regs., tit.13, § 2767.1, replacing all references to "section 2754" with "Cal. Code Regs., tit. 13, § 2418(b)."

3. The manufacturer must document all emissions-related parts installed in the OHRV and record the component Executive Order number or compliant emissions data for each part.

(G) Within 30 days of receipt of the application, the Executive Officer must determine whether an application is complete, if no determination is made the application is assumed to be incomplete.

(H) Within 90 days after an application has been deemed complete, the Executive Officer must approve or disapprove of the required documents. If approved, a component Executive Order of Certification will be granted by the Executive Officer. If disapproved, a component Executive Order of Certification will not be granted by the Executive Officer. The applicant and the Executive Officer may mutually agree to a longer time for reaching a decision. An applicant may submit additional supporting documentation before a decision has been reached.

(3) If the Executive Officer determines that a part for which an "approval" has been granted no longer meets the applicable emission standards, the Executive Officer may deny, suspend or revoke the component Executive Order following provisions in this Article.

(c) Advanced Fuel System Credits.

(1) A manufacturer is eligible to use advanced fuel system credits to certify OHRV evaporative families with the following requirements:

(A) OHRVs must be tested to the diurnal standards in section 2418(a); or, must be certified as a zero-emissions vehicle.

(B) In order to generate credits, zero emission vehicles must follow the administrative requirements in subdivision (d), to obtain an Executive Order of Certification.

(C) Certified zero emission vehicles will be awarded a 0.75 TOG diurnal credit by the Air Resources Board.

(D) Advanced fuel system credits may only be applied to emissions families of the same model year.

(E) A manufacturer may not sell or trade advanced fuel system credits.

(F) No evaporative family can be certified for sale in California that emits over 300 percent of the diurnal standard in section 2418(a).

(G) Results are to be calculated with consistent arithmetic units and rounded to the nearest tenth of a gram.

(H) Zero emission golf carts are not eligible to participate.

(I) A manufacturer shall offset TOG debits with TOG credits for each model year, so that the sum of total TOG credits is greater than or equal to the sum of TOG debits.

(2) For each model year, a manufacturer electing to certify with credits shall calculate TOG credits and debits separately for each evaporative family. For each evaporative family, the manufacturer must subtract the diurnal EFEL from the diurnal standard in Section 2418(a). A negative result is a TOG debit. A positive result is a TOG credit. For certified zero emission vehicles, the TOG credit is 0.75 g TOG/day for each vehicle certified. The result, or per zero emission vehicle credit, is multiplied by the number of projected sales for each evaporative family for the model year to calculate the total TOG credits or debits.

(3) The manufacturer bears the burden of establishing, to the satisfaction of the Executive Officer, that the conditions upon which the Executive Order of Certification was issued were satisfied. Evaporative family certification based on credits may be revoked based on review of end-of-year reports, follow-up audits, actual sales volumes, and any other verification steps considered appropriate by the Executive Officer. If any evaporative family is found to exceed the OHRV EFEL all vehicles sold under that Executive Order of Certification will be considered non-compliant with this regulation.

(d) Administrative Requirements.

(1) Maintenance of records.

(A) The manufacturer shall establish, maintain, and retain the following organized records for each evaporative family:

(i) ARB evaporative family identification code,

(ii) Model number and engine size,

(iii) Make and model name,

(iv) Projected sales volume for the model year,

(v) Certification test results,

(vi) Actual sales volume for the model year,

(vii) Phase-in calculation, and

(viii) Advanced fuel system credit calculations.

(B) For the purpose of this article, actual sales are defined as shipments to distributors of OHRV sold or offered for sale in California. The manufacturer must submit California actual sales data as it becomes available for each model sold or offered for sale in California, but no later than 90 days after the end of the model year.

(C) Records appropriate to establish the quantities of OHRVs that constitute actual sales for each evaporative family.

(D) The manufacturer shall retain all records required to be maintained under this section for a period of eight years from the due date for the end-of-model year report. Records may be retained as hard copy, CD-ROM, diskettes, and so forth, depending on the manufacturer's record retention procedure; provided, that in every case all information contained in the hard copy is retained. A manufacturer shall submit all information requested by the Executive Officer within 30 days of the date of such request.

(E) The Executive Officer may revoke or suspend the Executive Order of Certification for an evaporative family for which the manufacturer fails to retain the records required in this section or to provide such information to the Executive Officer upon request. No new Executive Orders of Certification will be issued to the manufacturer until the requested records are made available and/or a plan that describes the records to be retained as required by this section is approved by the Executive Officer.

(e) Final report.

(1) All manufacturers that certify OHRVs to subdivision (c) must generate a final report for each evaporative family that includes the OHRV projected sales volume, actual sales volume, and EFELs. Additionally, the following items must be included in the final report:

(A) Manufacturers that certify OHRVs using advanced fuel system credits, described in subdivision (c), must include a calculation to show that the total TOG credits are equal to or greater than TOG debits .

(B) At the end of the four year phase-in period, manufacturers that must submit a calculation to show at least 75 percent compliance with emission standards over the 4 year period, as described in section 2418(d).

(2) Unless otherwise approved by the Executive Officer, final reports must be submitted within 90 days of the end of the model year to: *Chief, Mobile Source Operations Division, Air Resources Board, 9528 Telstar Avenue, El Monte, CA 91731.*

(3) Failure by a manufacturer to submit any final reports in the specified time for any OHRV subject to regulation under this section is a violation.

(f) Evaporative Testing Requirements.

(1) Compliance Test Procedures.

(A) The Executive Officer may order an OHRV or evaporative system builder to make available for compliance testing and/or inspection one OHRV. Unless otherwise directed by the Executive Office, the OHRV(s) shall be delivered to: Haagen-Smit Laboratory Air Resources Board, 9528 Telstar Avenue, El Monte, CA 91731. The OHRV must be selected at random from sources specified by the Executive Officer according to a method approved by the Executive Officer which, insofar as practical, must exclude an OHRV that would result in an unreasonable disruption of the manufacturer's distribution system.

(B) Air Resources Board personnel shall have access to OHRV assembly plants, or distribution facilities for the purposes of OHRV selection and testing. Scheduling of access shall be arranged with the representative designated in the application for certification.

(C) All testing must be conducted in accordance with the applicable model year evaporative emission test procedures. Any evaporative emission control system parameters must be set to values or positions that are within the range available to the ultimate purchaser as determined by ARB. No break-in or modifications, adjustments, or special preparation or maintenance will be allowed on OHRVs chosen for compliance testing without the written consent of the Executive Officer. If the Executive Officer consents to break-in or modifications, adjustments, or special preparation or maintenance, they will be performed by the OHRV manufacturer under the supervision of ARB personnel.

(D) Correction of damage or maladjustment that may reasonably be found to have resulted from shipment of the OHRV is permitted only after an initial test of the OHRV, unless the damage prevents the test from being completed safely. The OHRV manufacturer may request that the OHRV be repaired from shipping damage. If the Executive Officer concurs, the OHRV may be retested, and the original test results may be replaced by the after-repair test results.

(E) The OHRV(s) must be randomly chosen from the selected evaporative families according to the criteria specified herein.

1. The OHRV must be representative of the OHRV manufacturer's California sales.

2. The OHRV will be selected from the end of the assembly line.

3. The selected OHRV must pass a visual inspection test, to verify the OHRV has the appropriate emission control systems as documented in the approved Executive Order of Certification for the evaporative family.

(F) OHRVs scheduled for compliance testing shall be selected, tested, and evaluated in accordance with TP-933, Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles, adopted [INSERT ADOPTION DATE]. The evaporative family will be deemed to have failed the compliance testing if the measured emissions are above the applicable EFEL.

(G) If the OHRV selected for inspection fails the requirements of this section, or fails to conform to the labeling requirements of section 2419.1, the Executive Officer shall notify the manufacturer in accordance with subdivision (f)(2).

(2) Notification of Failure.

If compliance testing identifies OHRVs that do not meet the evaporative emission standards set out in Section 2418, or that do not conform to the certification requirements in subdivision (b), the Executive Officer will notify the OHRV manufacturer. The Executive Officer shall also notify the OHRV manufacturer that the Executive Order of Certification may be suspended or revoked. The OHRV manufacturer shall have 30 calendar days in which to notify the Executive Officer of their intent to provide additional information and/or independent test results for five tanks, engines, or equipment that document compliance of the evaporative family. The Executive Officer will consider all relevant information provided by the manufacturer, and other interested parties, including, but not limited to corrective actions applied to the noncompliant evaporative family.

(g) Suspension and Revocation of Executive Orders of Certification.

(1) The Executive Officer shall not revoke or suspend the Executive Order of Certification, without considering any information provided by the OHRV manufacturer of such certification pursuant to subdivision (b).

(2) If the results of the compliance testing indicate that the failed OHRV of a particular evaporative family are produced at one plant, the Executive Officer may suspend the Executive Order of Certification with respect to the OHRVs manufactured at that plant only.

(3) Notwithstanding the foregoing, the Executive Officer may suspend an

OHRV or component Executive Order of Certification effective upon written notice to the OHRV manufacturer if the Executive Officer finds that:

(A) the OHRV manufacturer has refused to comply with any of the requirements of this section;

(B) the OHRV manufacturer has submitted false or incomplete information in any report or information provided to the Executive Officer under this section;

(C) the OHRV manufacturer has rendered inaccurate any test data submitted under this section; or

(D) ARB personnel have been denied the opportunity to conduct activities authorized under this section by the OHRV manufacturer.

(4) The Executive Officer may revoke an Executive Order of Certification for an evaporative family after the Executive Order of Certification has been suspended pursuant to subdivision (f)(1) or (f)(2) of this section if the proposed remedy for the nonconformity, as reported by the OHRV manufacturer to the Executive Officer, is one requiring a design change or changes to the evaporative emission control system as described in the application for certification of the affected evaporative family.

(5) Once an Executive Order of Certification has been suspended pursuant to subdivision (f) of this section, the OHRV manufacturer must take the following actions before the Executive Officer will consider reinstating the Executive Order of Certification:

(A) Submit a written report to the Executive Officer that identifies the reason for the noncompliance of the OHRV, describes the proposed remedy, including a description of any proposed quality control and/or quality assurance measures to be taken by the OHRV manufacturer to prevent future occurrences of the problem, and states the date on which the remedies will be implemented; and

(B) Demonstrate that the evaporative family for which the Executive Order of Certification has been suspended does in fact comply with the regulations of this part by testing an OHRV. The results must meet the criteria required for certification in subdivision (b). Such testing must comply with the provisions of this section.

(6) Once the Executive Order of Certification has been revoked for an evaporative family, if the OHRV manufacturer desires to continue introduction into commerce of a modified version of that evaporative family, then the OHRV manufacturer must, after implementing the change or changes

intended to remedy the nonconformity, demonstrate that the modified evaporative family does in fact conform to the applicable standards of section 2418 of this Article by having five OHRVs from the modified evaporative family tested following TP-933, unless such testing is waived by the Executive Officer.

(h) Tampering/Tamper Resistance.

(1) Manufacturers must design OHRV evaporative emissions control systems in such a way that they are resistant to tampering or removal.

(2) Any canister used to capture evaporative emissions from an off-road motorcycle must be mounted so it does not protrude from the OHRV such that it is prone to damage in a tip over.

(3) If the canister installed on an off-road motorcycle is outside what would otherwise be the cross-sectional profile of the OHRV (with the hoods closed and cargo boxes in the position required for operation), or if the canister installed on an OHRV, except off-road motorcycles, is visible to someone standing next to the OHRV when the OHRV is completely assembled, then the canister must be mounted such that non-conventional tools are required to remove it and the vapor line connections to the canister. Otherwise, fasteners requiring conventional tools may be used.

(4) The evaporative system must be designed in such a way that tampering/disassembling is not needed to conduct normal functions. Normal functions include routine maintenance and refueling of the OHRV.

(5) OHRV owners are responsible for confirming all add-on or modified parts installed on OHRVs are compliant with evaporative emissions standards.

(6) Manufacturers must publish the following statement in the owner's manual to inform OHRV owners of California regulations that prohibit tampering with emission control systems: "An add-on or modified part must be compliant with applicable CARB emission control standards. A violation of this requirement is punishable by civil and/or criminal punishment."

(7) Manufacturers must include an OHRV tampering statement for all new OHRVs certified to a standard set out in this Article informing OHRV owners of laws that prohibit tampering. This may be accomplished by attaching a tag to the OHRV or printing on the front cover of the owner's manual.

(A) The OHRV tampering statement text must be printed in the English language, and use block letters and numerals, which shall be of a color that contrasts with the background.

(B) The OHRV tampering statement text must be large enough to be clearly legible.

(C) The OHRV tampering statement shall include a warning statement that reads "The removal or modification of emission-related parts on this OHRV is illegal. Violators may be subject to civil and/or criminal penalties as provided under California and federal law."

(D) If a removable tag is used the OHRV tampering statement must be fastened in a way that it is destroyed upon removal. The tag must also include an additional statement that reads "This tag may not be removed under penalty of law except by the vehicle owner."

(8) Any tampering, removal or modifications of the evaporative emissions control system is prohibited under part 1068.101(b)(1), Title 40, Code of Federal Regulations.

(A) Peace officers are given the authority to enforce illegal vehicle tampering by section 27156 of the California Vehicle Code.

(B) Section 27156 of the California Vehicle Code prohibits the installation of any add-on or modified emission-related part on any pollution-controlled OHRV, unless the part has been exempted by ARB. ARB exempts an OHRV part from the prohibition of VC 27156 if the part is found to do either of the following: 1) not reduce the effectiveness of any required emission control device on the OHRV or 2) demonstrate that the applicable emission standards are being met when the part(s) are installed on the OHRV. Sale or installation of any aftermarket part or parts, which could potentially affect the evaporative system, in California without an ARB approved Anti-Tampering Exemption is prohibited as stated in Cal. Code Regs., tit.13, § 2470 – 2476.

(i) Inspection.

The Executive Officer, or an authorized representative of the Executive Officer, may periodically inspect any facility which sells or offers for sale or manufactures OHRVs, sells or offers for sale or manufactures engines, or sells or offers for sale or manufactures evaporative emission control components, technology, or systems subject to this Article as deemed necessary to ensure compliance with these regulations. Failure of a manufacturer, distributor, retailer or other person subject to this Article to allow access for inspection purposes may be grounds for suspension or revocation of an Executive Order of Certification.

NOTE: Authority cited: Sections 39600, 39601 and 43013, Health and Safety Code. Reference: Section 43013, Health and Safety Code. Section 27156, Vehicle Code.

Attachment B:

TP-933

Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles

May 2013

Adopted: [insert adopted date]

California Air Resources Board

Monitoring and Laboratory Division

Note: This is a Newly Adopted Test Procedure shown without underline as permitted by California Code of Regulations.

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TP-933

TABLE OF CONTENTS

1 APPLICABILITY 1

1.1 Terms and Definitions..1

1.2 Test Data Availability 2

1.3 Safety 2

1.4 Test Fuel Specification..2

1.5 Alternative Test Procedures..2

2 PRINCIPLE AND SUMMARY OF TEST PROCEDURES..................................2

3 INSTRUMENTATION..5

3.1 Vehicle Test Enclosure 5

3.2 Dynamometer 5

3.3 Fuel Vapor and Alcohol Hydrocarbon Analyzer..5

3.4 Test Data Recording System 6

3.5 Carbon Canister Bench Aging Equipment..6

3.6 Carbon Canister Test Bench..6

4 DURABILITY TESTING 6

4.1 Carbon Canister Test..7

4.2 Pressure Vent Valve 8

4.3 Carbon Canister Protection - Tip Test..8

5 EVAPORATIVE EMSSIONS SYSTEM PRECONDITIONING 9

5.1 Soak Fuel System Components..10

5.2 Precondition Carbon Canister..11

6 EVAPORATIVE EMISSIONS TEST PROCEDURES.......................................12

6.1 Fuel System Leakage Tip Test 12

6.2 Running Loss Conditioning 14

6.3 Hot Soak Preconditioning 15

6.4 Diurnal Test..15

7 CALCULATIONS: EVAPORATIVE EMISSIONS 16

8 LIST OF TERMS..17

9 DOCUMENTS INCORPORATED BY REFERENCE 17

10 APPENDICES..18

10.1 Appendix A - Calculation Method for Demonstrating the Adequacies of the Vented Evaporative Emissions System 18

10.2 Appendix B – Variable Speed Cooling Blower 29

TP-933

Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles (OHRVs)

1 APPLICABILITY

Test Procedure 933 (TP-933) is used by the Air Resources Board (ARB) to determine OHRV evaporative emissions. This test procedure is proposed pursuant to Section 43824 of the California Health and Safety Code (CH&SC).

1.1 Terms and Definitions

This test procedure incorporates by reference the definitions set forth in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" as amended March 22, 2012, and Title 13, California Code of Regulations (CCR) Section 2417. In addition, the following definitions apply:

1.1.1 For the purpose of this procedure, when the term "Administrator" is used in any federal regulations referenced within this document, it shall mean the ARB Executive Officer or his or her authorized representative or designate.

1.1.2 For the purpose of this procedure, the term "ARB" refers to the California Air Resources Board.

1.1.3 For the purpose of this procedure, the term "Deterioration factor" means the ratio of emissions after and before durability testing.

1.1.4 For the purpose of this procedure, the term "Executive Officer" refers to the ARB Executive Officer or his or her authorized representative or designate.

1.1.5 For the purpose of this procedure, the term "horizontal plane" shall mean:

1.1.5.1 For vehicles with two wheels, the plane which contains the line defined by the points where the vehicle's front and rear tires are in contact with the testing surface when positioned in normal upright riding position on the level testing surface and which is parallel to the axis of the wheel axles.

1.1.5.2 For vehicles with three or more wheels, the plane defined by the points where the vehicle's tires contact the testing surface while the vehicle is positioned in normal upright riding position on the level testing surface with the tires inflated to normal manufacturer recommendations.

1.1.6 For the purpose of this procedure, when the term "methanol" is used in any federal regulations referenced within this document, it shall mean methanol and/or ethanol, except as otherwise indicated in this test procedure.

1.1.7 For the purpose of this procedure, the term "travel axis" shall mean the axis defined by the direction the vehicle travels while in normal use and located in the horizontal plane that the vehicle sits.

1.1.8 For the purpose of this procedure, the term "upright axis" shall mean a line passing through the travel axis which is perpendicular to the horizontal plane. Under normal use conditions, this is the same as the vertical axis.

1.1.9 For the purpose of this procedure, the term "useful life" shall mean the time required for half the number of vehicles sold in a model year to no longer be in use.

1.2 Test Data Availability

The manufacturer shall provide the specific information that supports its assurance of the system's performance with the requirements within this procedure within 30 days of a written request by the Executive Officer.

1.3 Safety

This test procedure involves the use of flammable materials and should only be used by, or under the supervision of, those familiar and experienced in the use of such operations and materials. Appropriate safety precautions should be observed at all times while performing this test procedure.

1.4 Test Fuel Specification

The test fuel used for all parts of this procedure, unless otherwise specified, shall be California certification gasoline as specified in "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" Section II.A.100.3.1.2 as adopted March 22, 2012, as incorporated by reference herein.

1.5 Alternative Test Procedures

With prior approval alternative test procedures can be used. It must be demonstrated that the alternative method is equivalent to or more stringent than the method set forth in this test procedure.

2 PRINCIPLE AND SUMMARY OF TEST PROCEDURES

This test procedure measures evaporative emissions from a complete vehicle or piece of equipment with complete evaporative emission control systems as defined in 13 CCR 2752 (a)(8) by subjecting them to durability tests, preconditioning, and a diurnal evaporative test as described in Section 6 of this procedure. The engine with a complete evaporative emission control system must be tested as a complete vehicle except where a test rig is explicitly allowed. Where not otherwise specified, the vehicle shall be in an approximately level position during all phases of the test sequence.

Prior to evaporative emissions testing, the vehicle's evaporative emissions control system must undergo durability testing to ensure that the emissions control devices continue to function as designed for the useful life of the vehicle. Real world end of useful life emissions are simulated during vehicle preconditioning.

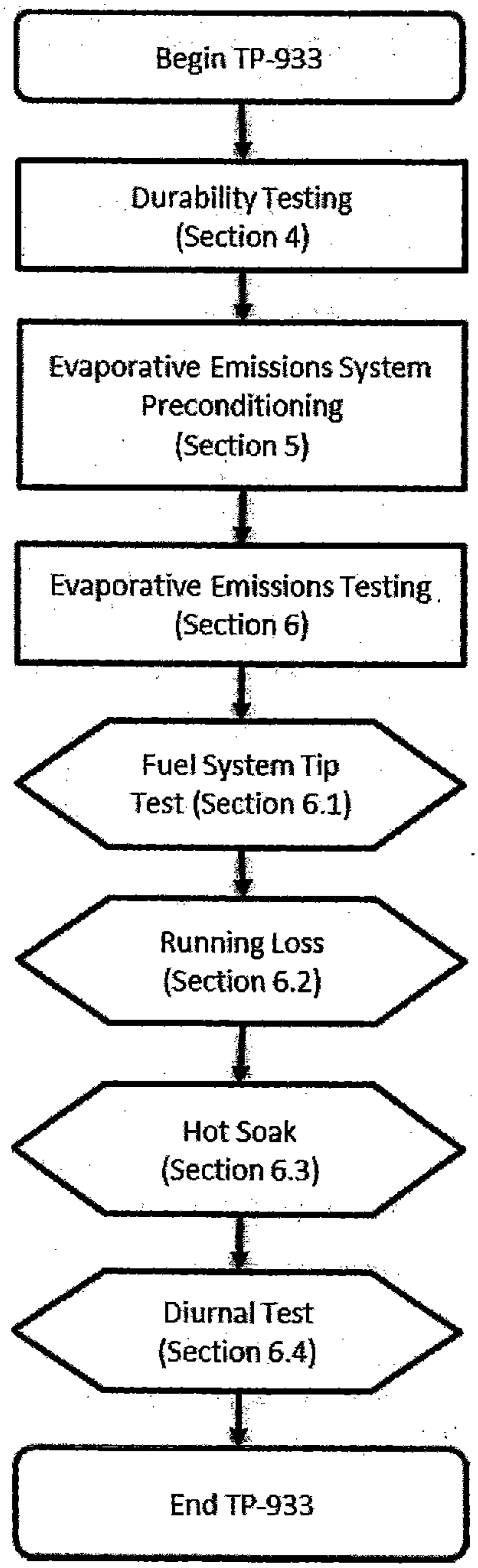
Evaporative emissions are quantified by direct measurement or by a combination of direct measurement and calculation. Evaporative emissions are directly measured with a hydrocarbon analyzer in a sealed testing enclosure following a defined temperature profile and maintaining atmospheric pressure. The volume of the enclosure must be accurately determined whenever hydrocarbons are being measured. The total mass of hydrocarbons emitted from a test vehicle over the test period is calculated based on measured concentration, known molecular weight, and volume of the testing enclosure.

The vehicle shall demonstrate adequate control of diurnal emissions through one of the following test sequences:

Vehicle may undergo a 72-hour diurnal evaporative emissions test with variable temperature as defined in Section 6.4.1.

Alternatively, a steady state diurnal test may be used to show compliance. The vehicle's evaporative emissions control system is demonstrated to be adequately designed and constructed by performing a 24-hour diurnal test in conjunction with the vented emissions requirements as described in Section 6.4.2. The steady state diurnal test must be conducted with the testing enclosure maintained at a constant temperature of 86°±3°F, with a vent connecting the evaporative vent of the vehicle to the atmosphere outside the testing enclosure. The purpose of the steady state diurnal test is to evaluate fuel permeation and verify the construction of the evaporative emissions control system. Compliance is shown with the vented emissions requirement using the Calculation Method as described in Appendix A or by using a pressure relief valve that opens at 2 pounds per square inch (psi) or greater, or which does not release vapor from the tank during the second of two consecutive 24-hour diurnal temperature cycles from 72° to 96°F. A flowchart summarizing the procedure is shown in Figure 1.

Figure 1: TP-933 Summary Flowchart



3 INSTRUMENTATION

Equipment used during this testing shall, at a minimum, meet the requirements set forth in this section. This document incorporates by reference Title 40, Code of Federal Regulations (CFR), Part 86 – CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES, Subpart 107-96, 108-79, 108-00, and 508-78.

3.1 Vehicle Test Enclosure

This test procedure incorporates by reference "CALIFORNIA EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES FOR 2001 AND SUBSEQUENT MODEL MOTOR VEHICLES" as amended March 22, 2012, Parts III.A and III.B, for evaporative emission measurement enclosure requirements and calibrations with the following exceptions:

3.1.1 The fuel tank temperature is not controlled in this procedure for the diurnal evaporative tests and the tip tests. Fuel tank temperature is only controlled for the pressure relief option in Section 6.4.2. Therefore, disregard all sections pertaining to fuel tank temperature monitoring and fuel tank temperature management systems except as required.

3.1.1.1 If showing compliance with a pressurized fuel tank, revise subparagraph 40 CFR §86.107-96(e), (Temperature Recording System) to read: In addition to the specifications in this section, the vapor temperature in the fuel tank must be measured. When the fuel or vapor temperature sensors cannot be located in the fuel tank to measure the temperature of the prescribed test fuel or vapor at the approximate mid-volume (e.g. saddle tank), sensors shall be located at the approximate mid-volume of each fuel or vapor containing cavity. The average of the readings from these sensors shall constitute the fuel or vapor temperature. The Executive Officer may approve alternate sensor locations where the specifications above cannot be met or where tank symmetry provides redundant measurements.

3.2 Dynamometer

3.2.1 The chassis dynamometer shall meet the requirements of 40 CFR §86.508-78, 40 CFR §86.108-00, or 40 CFR §86.108-79 as long as it is capable of accurately simulating the test weight of the vehicle.

3.2.2 The chassis dynamometer shall be calibrated according to the requirements used in 3.2.1 above. The calibration shall be conducted at a temperature of 86°F ±3°F.

3.3 Fuel Vapor and Alcohol Hydrocarbon Analyzer

The fuel vapor and alcohol hydrocarbon analyzer shall meet the requirements specified in 40 CFR §86.107-96(b). As described in Section 7, ethanol measurements may be omitted if the calculated mass of hydrocarbon emissions is multiplied by an adjustment factor that accounts for alcohol vapor.

3.4 Test Data Recording System

An on-line computer system or strip-chart recorder shall be used to record the following parameters during the test sequence:

a) Cell/enclosure ambient temperature
b) If applicable, temperatures of vehicle fuel tank liquid (T_{liq}) and vapor space (T_{vap})
c) If applicable, vehicle fuel tank headspace pressure
d) If applicable, dynamometer roll speed
e) Flame Ionization Detector (FID) output voltage recording the following parameters for each sample analysis:
   1) zero gas and span gas adjustments
   2) zero gas reading
   3) If applicable, dilute sample bag reading
   4) If applicable, dilution air sample bag reading
   5) zero gas and span gas readings
f) Ethanol sampling data including the:
   1) volumes of deionized water introduced into each impinger
   2) rate and time of sample collection
   3) volumes of each sample introduced into the gas chromatograph
   4) flow rate of carrier gas through the column
   5) column temperature
   6) chromatogram of the analyzed sample

3.5 Carbon Canister Bench Aging Equipment

Carbon canister bench aging equipment shall meet the requirements specified in Section 4.1 of this procedure.

3.6 Carbon Canister Test Bench

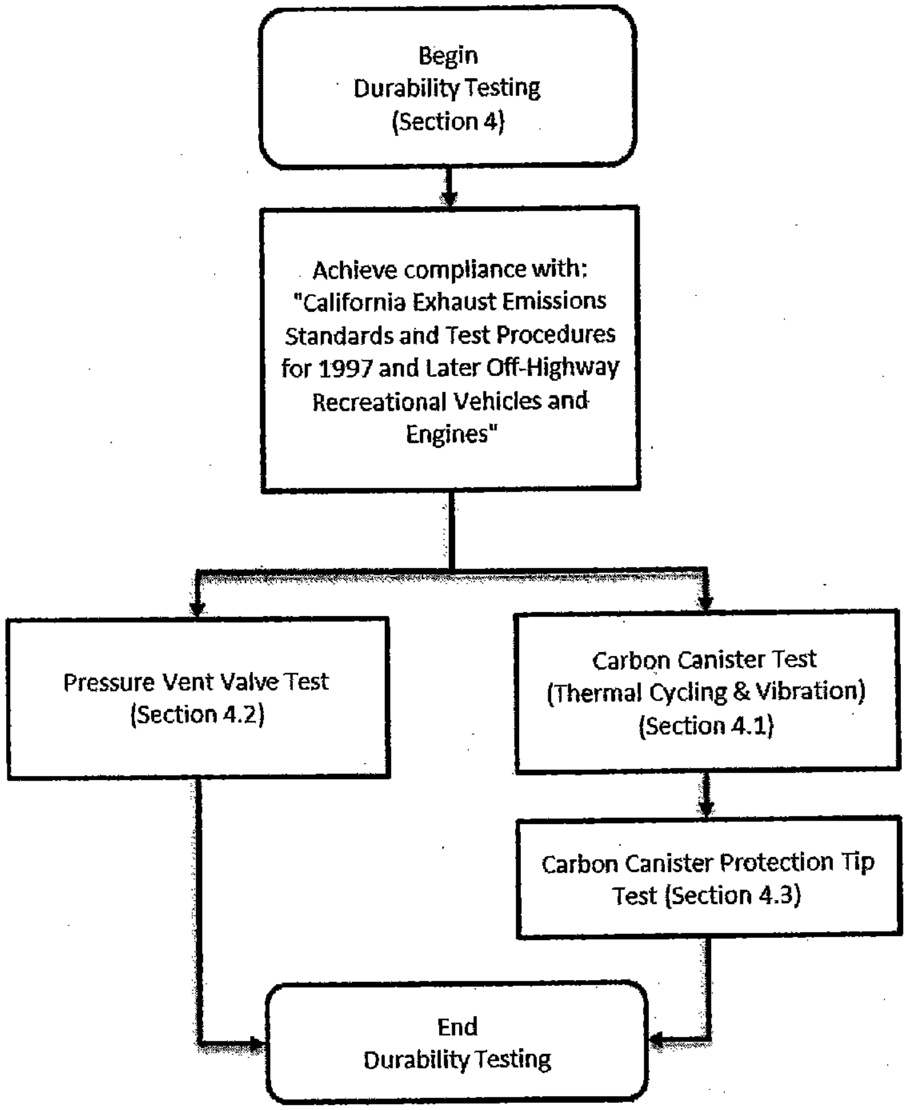
The carbon canister test bench or associated combination of testing equipment shall meet the requirements specified in Section 5.2 of this procedure.

4 DURABILITY TESTING

Certification of an OHRV evaporative emission control system requires a manufacturer to first demonstrate the durability of each evaporative emission control system family. This is required prior to performing the evaporative emissions test described in Section 6 to ensure the vehicle will meet evaporative emissions standards over the useful life of the vehicle. The evaporative emission control system must satisfy durability requirements as prescribed in "901 " as amended, July 16, 2007, and incorporated here by reference. This must be done before proceeding to the durability testing section of this procedure, unless each evaporative emissions-related part has undergone durability testing for exhaust in another model of the same vehicle as specified in *California Exhaust Emissions Standards And Test Procedures For 1997 And Later Off-Highway Recreational Vehicles And Engines*, California Environmental Protection Agency, Air Resources Board, El Monte, CA, August 15, 2007 and incorporated here by reference.

In addition, OHRV manufacturers must comply with the durability requirements in Sections 4.1 through 4.3 of this test procedure or get approval for ARB for an alternative durability procedure. Carry-over and carry-across of deterioration factors may be allowed for systems using components that have successfully completed durability testing. Applicants shall be allowed to proceed to Section 5 of this test procedure if they remain free of defects after the durability tests prescribed below. An applicant may propose modifications to the durability tests in this section if they can clearly demonstrate that the alternative durability test procedures are representative of end of useful life. Durability testing shall include the steps outlined in Figure 2.

Figure 2: Durability Flow Chart



4.1 Carbon Canister Test

For systems that utilize a carbon canister, the durability test procedures shall include thermal cycling and vibration exposure of the canister.

4.1.1 For thermal cycling, the test must subject the canister to 100 cycles of the following temperature profile:

4.1.1.1 Heat and hold at 140°F ±4°F for 30 minutes. (Up to 10 minutes is allowed for the temperature to rise and stabilize)

4.1.1.2 Cool and hold at 32°F ±4°F for 30 minutes. (Up to 20 minutes is allowed for the temperature to reach 32°F during the cooling period)

4.1.2 For the vibration test, the canister must be subject to a peak horizontal acceleration of 4.5 x gravitational acceleration (g – 9.8 meters per second squared) at 60 Hertz (Hz) with a total of 10,000,000 cycles. The orientation of the canister, while being subject to vibration, must be the same as when mounted on the vehicle during normal use. If the canister is mounted on the vehicle using a vibration isolation system, the canister may be mounted in a test rig using the same vibration isolation system for conducting the test.

4.2 Pressure Vent Valve

If the fuel system employs a fuel vapor pressure vent valve, prior to the time of submission of a certification application, the applicant is required to submit and obtain approval of an evaporative emission durability test procedure for the pressure vent valve. The procedure shall have provisions to demonstrate durability after exposure to ultraviolet (UV) light, ozone, vibration and dust. Once approved, the pressure vent valve durability procedure may be used by any applicant using a similar pressure vent valve.

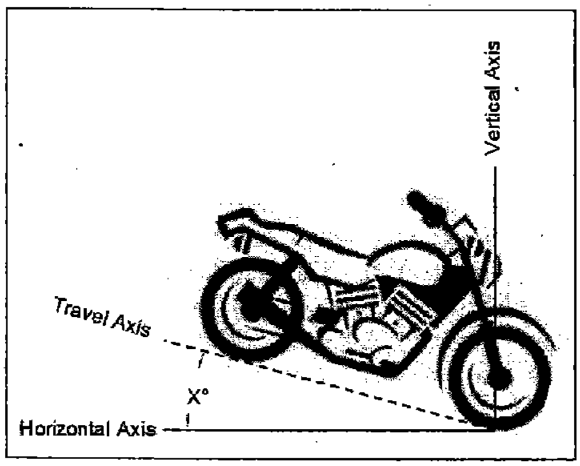
4.3 Carbon Canister Protection - Tip Test

The carbon canister protection tip test can be conducted with a vehicle or with a test rig that represents the actual position and orientation of the fuel system components. The fuel tank must be filled to 100 percent of nominal capacity with certification fuel.

4.3.1 Orient the vehicle such that the travel axis is tilted X degrees above and below the horizontal plane. See Figure 3 for a schematic. Hold the vehicle for at least 1 minute in both the positive and negative position. X shall be as defined as follows:

a) 30° ±2° for off-road motorcycles.
b) 30° ±2° for all other OHRVs.

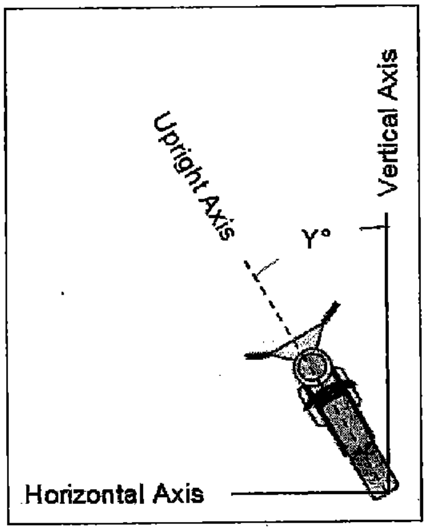
Figure 3: Horizontal Tilt



4.3.2 Orient the vehicle such that the upright axis is tilted Y degrees from the vertical axis with rotation being about the travel axis. See Figure 4 for a schematic. Hold this position in both the positive and negative position for at least 1 minute each. Y shall be as defined as follows:

a) Unsupported position on either side for off-road motorcycles (i.e., vehicle lying on its side).
b) 15° ±2° for all other OHRVs.

Figure 4: Vertical Tilt



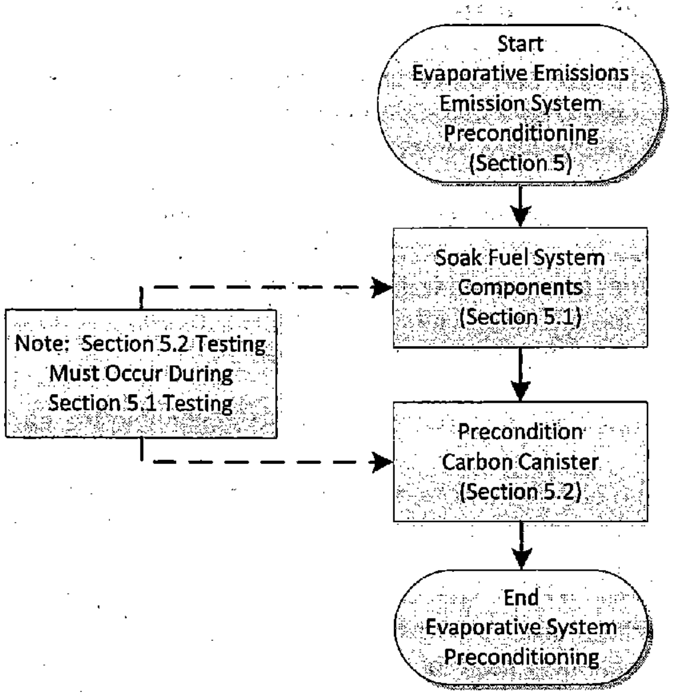
The weight of the vehicle's carbon canister must be measured before and after the tests specified in this section to determine weight gain. If the weight gain is 10 percent of the butane working capacity or more, the vehicle fails the test.

Alternative carbon canister protection tip tests may be submitted for approval. All proposed alternatives to the carbon canister protection tip test must show that the carbon canister functions as it should at the end of useful life, while subjecting it to the potential for liquid gasoline contamination consistent with vehicle usage. As a guideline, all alternative carbon canister tip tests should include real world liquid fuel exposure (e.g. volumes, rates, and total events), real world purges (e.g., rates and bed volumes), and use of a damaged canister during testing as described in this procedure.

5 EVAPORATIVE EMSSIONS SYSTEM PRECONDITIONING

The purpose of the preconditioning period is to introduce test fuel into the fuel system and condition all fuel system components to in-use conditions. Evaporative system preconditioning can be done in conjunction with mileage accumulation for exhaust testing as long as the fuel system has continuously held evaporative test fuel E10 (Commercial Pump Fuel containing 10 percent ethanol) for a total 140 days. E10 pump fuel may only be used for the portion of the soaking period; however, fuel must be switched to E10 certification fuel for a minimum of 30 days prior to testing. The preconditioning procedure shall include the steps outlined in Figure 5.

Figure 5: Preconditioning Flowchart



5.1 Soak Fuel System Components

Precondition the tank and other fuel delivery system components by filling the tank to its nominal capacity with fresh test fuel. Cap the tank within one minute of filling. After filling the tank, start the vehicle engine and allow it to idle for approximately fifteen minutes. Soak the tank and other components continuously for a total of 3,360 hours while maintaining an ambient temperature between 68°F and 86°F. Alternatively, components may be preconditioned using a fuel system test rig. The test rig must include all the components of the fuel and evaporative emissions control system connected and oriented as they would be installed in the vehicle. The tank and fuel lines must be filled with certification fuel at the beginning of the test. A fuel system may be soaked for less than 3,360 hours if data is provided using one of the following two documents incorporated by reference: "TP-901 - Test Procedure for Determining Permeation Emissions from Small Off-Road Engines and Equipment Fuel Tanks" adopted July 26, 2004 or 40 CFR §1060.520 which was adopted on October 8, 2008 that shows steady state permeation has been reached. If slosh testing is required, the slosh time may be considered part of the preconditioning period, provided all fuel system components tested remain filled with fuel, and are never empty for more than one hour over the entire preconditioning period.

If the fuel system is allowed to sit more than 6 weeks at 68°F to 86°F, a 1-week presoak must be conducted with fresh fuel before testing begins. The fresh fuel presoak can be counted as part of the 3,360-hour soak, so long as the fuel system is empty less than one hour.

Prior to beginning any test sequence to measure running loss, hot soak, or diurnal emissions, a vehicle may, at the manufacturer's option, be preconditioned to minimize non-fuel emissions by being soaked at an elevated temperature prior to testing. To ensure steady state permeation rates, the vehicle must be soaked for at least 7 days at a temperature no higher than 95°F immediately prior to emissions testing.

5.2 Precondition Carbon Canister

For systems that utilize carbon canisters, Subsections 5.2.2 through 5.2.4 of the preconditioning sequence must be completed no sooner than 96 hours preceding the beginning of the evaporative emission test procedure described in Section 6 at 86° ±3°F.

For vehicles with multiple canisters in a series configuration, the set of canisters must be preconditioned as a unit. For vehicles with multiple canisters in a parallel configuration, each canister must be preconditioned separately. If production evaporative canisters are equipped with a functional service port designed for vapor load or purge steps, the service port shall be used to precondition the canister.

The following steps shall be performed in preconditioning the carbon canister:

5.2.1 Determine the canister's nominal working capacity based on the average capacity of no less than five canisters. These five canisters shall be the same as the canister on the vehicle undergoing testing. A manufacturer may use the butane working capacity provided by the canister vendor, if the vendor certifies that the working capacity has been determined using the following procedures:

a) Each canister must be loaded no less than 10 times and no more than 100 times, to 2 gram breakthrough with a 50/50 mixture by volume of butane and nitrogen, at a rate of 15 ±2 grams butane per hour per liter of canister volume. Each canister loading step must be preceded by canister purging with 300 canister bed volume exchanges at 0.8 cubic feet per minute (cfm) per liter of canister volume.

b) Each canister must first be purged with 300 canister bed volume exchanges at 0.8 cfm per liter of canister volume. The working capacity of each canister shall be established by determining the mass of butane required to load the canister from the purged state so that it emits 2 grams of hydrocarbon vapor; the canister must be loaded with a 50/50 mixture by volume of butane and nitrogen, at a rate of 15 ±2 grams butane per hour per liter of canister volume.

5.2.2 Prepare the vehicle's evaporative emission canister for the canister purging and loading operation. The canister shall not be removed from the vehicle, unless access to the canister in its normal location is so restricted that purging and loading can only reasonably be accomplished by removing the canister from the vehicle. Special care shall be taken during this step to avoid damage to the components and the integrity of the fuel system. A replacement canister may be temporarily installed during the soak period while the canister from the test vehicle is preconditioned.

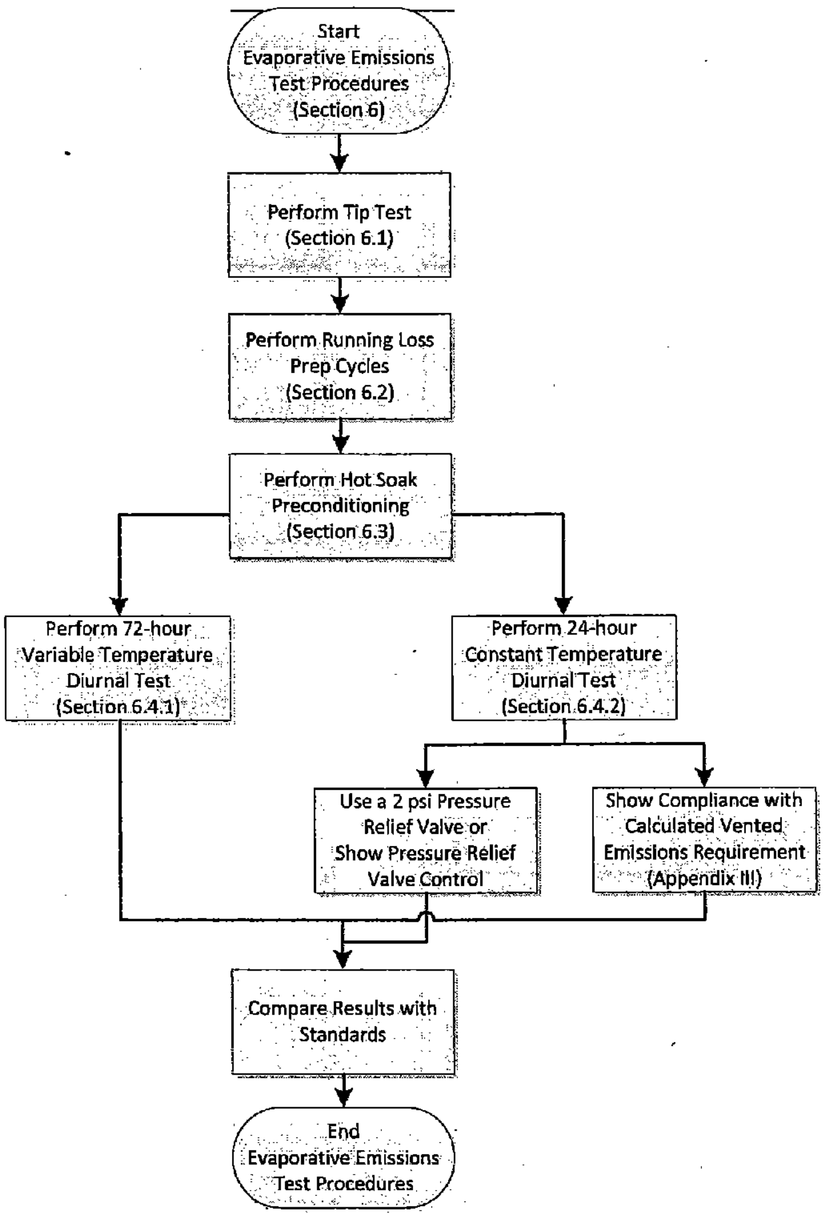
5.2.3 The canister purge shall be performed with ambient air of humidity controlled to 50 ±25 grains per pound of dry air. This may be accomplished by purging the canister in a room that is conditioned to this level of absolute humidity. The flow rate of the purge air shall be maintained at a nominal flow rate of 0.8 cfm per liter of canister volume and the duration shall be determined to provide a total purge volume flow through the canister equivalent to 300 canister bed volume exchanges. The bed volume is based on the volume of adsorbing material in the canister.

5.2.4 The evaporative emission canister shall then be loaded by sending to the canister an amount of commercial grade butane vapors equivalent to 1.5 times its nominal working capacity. The canister shall be loaded with a mixture composed of 50 percent butane and 50 percent nitrogen by volume at a rate of 15 ±2 grams butane per hour per liter of canister volume. If the canister loading at that rate takes longer than 12 hours, a manufacturer may determine a new rate, based on completing the canister loading in no less than 12 hours. The new rate may be used for all subsequent canister loading within this preconditioning. The time of initiation and completion of the canister loading shall be recorded.

6 EVAPORATIVE EMISSIONS TEST PROCEDURES

The Evaporative Emissions Test Procedures shall include the steps outlined in Figure 6.

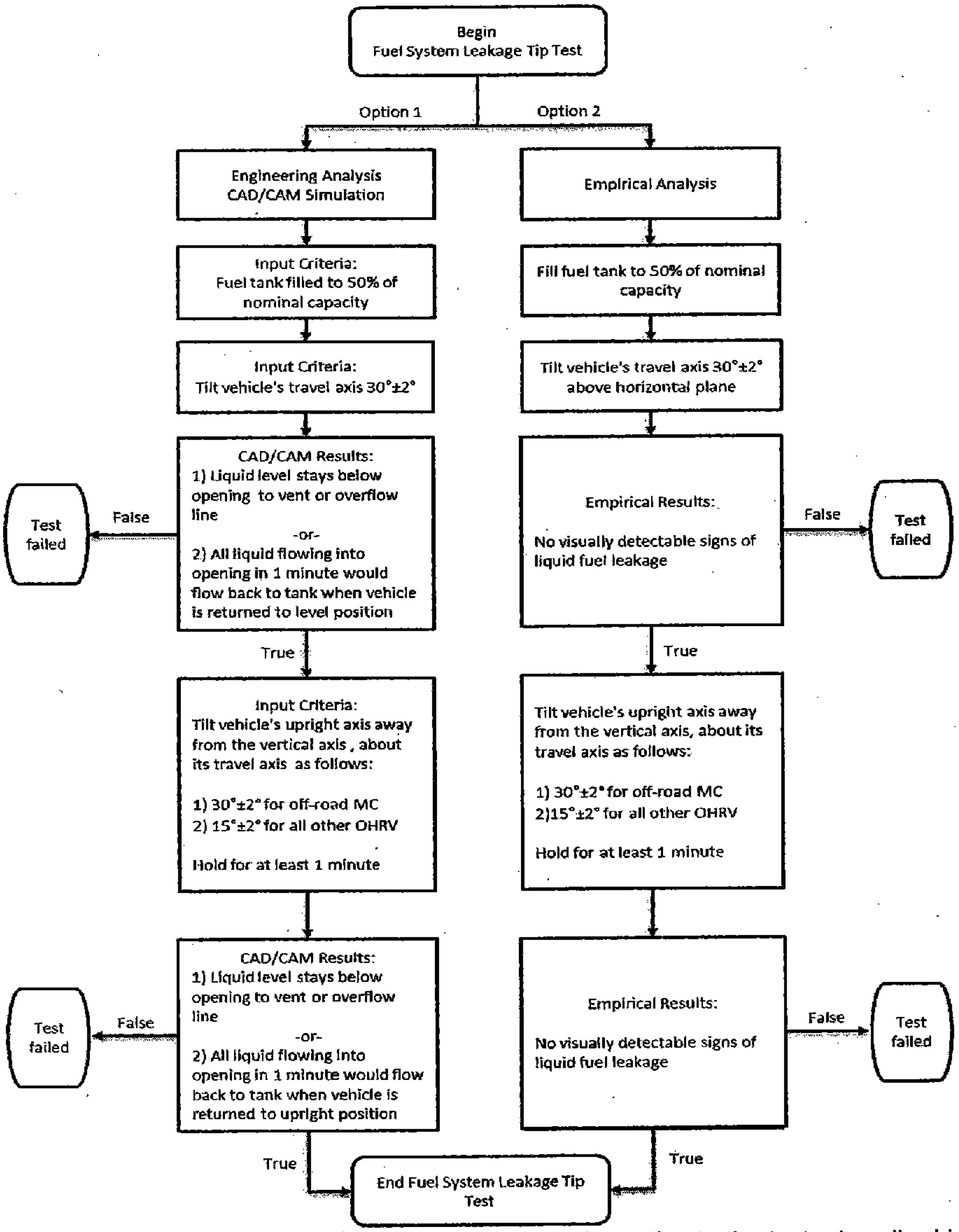
Figure 6: Evaporative Emissions Testing Flowchart



6.1 Fuel System Leakage Tip Test

The fuel system leakage tip test shall be performed during the soak specified in Subsection 6.2.1.5. The fuel tank must be filled to 50 percent with certification fuel. During the test the vehicle is tipped to inspect for visible signs of liquid leakage. If any test fuel leakage is observed, then the vehicle fails the test. See Figure 7 for a summary of the steps in the fuel system leakage tip test.

Figure 7: Fuel System Leakage Tip Test Flow Chart



An engineering analysis may be performed as an alternative to the tests described in this section. The analysis must demonstrate that zero liquid leakage will occur within one minute when the vehicle, with the gasoline tank filled to 50 percent of rated capacity, is tipped as specified in Subsection 6.1.

To perform the analysis, a Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) design program may be used to determine the level of fuel in the system that would occur when the tank is filled to 50 percent of its nominal capacity. To demonstrate compliance, the height of the fuel surface when the vehicle is tilted must be below the height of any opening to a vent or overflow line or it must be demonstrated that the total volume of fuel flowing into the opening in one minute would flow back into the fuel tank when the vehicle is returned to a level surface.

All tip measurements shall be made to an accuracy of ±1° of arc.

The tip test shall be conducted with the vehicle on a level surface as described below:

6.1.1 Orient the vehicle such that the travel axis is tilted X degrees above and below the horizontal plane. See Figure 3 for a schematic. Hold the vehicle for at least 1 minute in both the positive and negative position. Note any visible signs of fuel leakage. X shall be as defined as follows:
   a) 30° ±2° for off-road motorcycles.
   b) 30° ±2° for all other OHRVs.

6.2 Running Loss Conditioning

The running loss test is designed to simulate vehicle operation and canister purging during operation. Follow the dynamometer schedules in 40 CFR §86.515-78, incorporated here by reference. For the purpose of this running loss conditioning, all soak and test temperatures are 86° ±3°F.

6.2.1 The following steps shall be performed before beginning the running loss test:

6.2.1.1 The fuel tank of the vehicle to be tested shall be drained and refilled to 50 percent with test fuel.

6.2.1.2 Soak for at least 6 hours after being refueled. Following this soak period, conduct a refueling cycle by running the test vehicle through one Urban Dynamometer Driving Schedule (UDDS) driving cycle. The drain and fill and 6-hour soak may be omitted on subsequent tests of the vehicle if the vehicle remains under laboratory temperatures between tests. The later test preconditioning will begin with Subsection 6.2.1.5.

6.2.1.3 Install fuel temperature sensors as needed.

6.2.1.4 Drain and refill the fuel tank of the vehicle to 50 percent with test fuel.

6.2.1.5 Soak the vehicle with the key off for 12 to 36 hours between the end of the refueling and the start of the cold start preconditioning cycle.

6.2.1.6 During the soak period, perform the tip test specified in Subsection 6.1 and purge and load the evaporative control system canister using the procedures defined in Sections 5.2.2, 5.2.3, and 5.2.4. The evaporative control system canister is not required to be installed while performing the tip test specified in Subsection 6.1.

6.2.1.7 The location and speed of a fan used to cool the vehicle must comply with the requirements described in Appendix B.

6.2.1.8 The speed profile is the United Stated Environmental Protection Agency (U. S. EPA) UDDS as specified in 40 CFR §86.515-78. The same cycle (Class I or Class II) must be used as is required for exhaust emissions certification. The steady state engine test for All-Terrain Vehicles (ATV) is not allowed for this test procedure.

6.2.1.9 Perform a cold start UDDS preconditioning cycle on the dynamometer.

6.2.1.10Perform a hot start UDDS preconditioning cycle on the dynamometer.

Following the completion of the running loss preconditioning, a hot soak preconditioning must be conducted as specified in Subsection 6.3.

6.3 Hot Soak Preconditioning

The hot soak evaporative emission preconditioning is designed to soak the OHRV after operation. The test temperature for the hot soak is 86° ±3°F.

6.3.1 The hot soak must be performed within 7 minutes of the completion of the UDDS hot start cycle, performed in Subsection 6.2.

6.3.2 Turn off all engine cooling fans when the engine is turned off.

6.3.3 During the time between the end of the UDDS hot start cycle and the beginning of the hot soak preconditioning, the engine is allowed to be shut off for no more than 4 minutes immediately preceding the start of the hot soak preconditioning.

6.3.4 Soak the OHRV at 86° ±3°F for 90 ±0.5 minutes.

6.3.5 If the Calculation Method is to be used for the diurnal test, the carbon canister must be removed immediately following the hot soak test and the butane working capacity must be determined by loading the canister to 2 gram breakthrough with a 50/50 mixture by volume of butane and nitrogen, at a rate of 15 ±2 grams butane per hour per liter of canister volume.

6.3.6 Upon completion of the hot soak test, proceed to the diurnal test in Subsection 6.4.

6.4 Diurnal Test

Upon completion of the hot soak, the diurnal test shall begin. The diurnal test can be conducted by direct measurement of three consecutive 24-hour diurnal tests (72-hour diurnal test) or by measuring emissions for a single 24-hour diurnal test and showing vented emissions compliance (steady state diurnal test) as described in Sections 6.4.1 and 6.4.2, respectively.

6.4.1 72-Hour Diurnal Test - Begin the 3-day diurnal test by lowering the temperature of the enclosure in which the diurnal test will be performed to 72° ±3°F within 60 minutes of completing the hot soak test. Diurnal soak period is 6 to 36 hours at 72° ±3°F. Perform the diurnal test procedure described in 40 CFR §86.133-96, incorporated her by reference with the following exceptions.

6.4.1.1 When the word "methanol" or the term C_{CH3OH} (methanol concentration) is used, it shall be replaced by ethanol or the term C_{C2H5OH} (ethanol concentration).

6.4.1.2 All references to the hot soak test performed in 40 CFR §86.138-96 shall mean the hot soak conditioning previously described in Section 6.3 of this procedure.

6.4.1.3 All references to the calculations performed in 40 CFR §86.143 shall be replaced with the calculations performed in Section 7 of this procedure.

6.4.1.4 Omit the following language from Section (a)(1), "The diurnal emission test may be conducted as part of either the three-diurnal test sequence or the supplemental two-diurnal test sequence, as described in 40 CFR §86.130-96."

6.4.1.5 Omit Section (a)(3), and all of Sections (j), (o) and (p).

6.4.1.6 Omit the following language from Section (e), "...and the test vehicle windows and luggage compartment(s) opened...".

6.4.1.7 Revise Section (i)(5) as follows, "Within 10 minutes of closing and sealing the test enclosure doors, analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time=0 minutes) hydrocarbon concentration, CHC_i, required in Section 7 of this procedure. The final hydrocarbon measurement shall be conducted no more than 60 seconds from the end of the test."

6.4.1.8 Omit the following language from Section (n), "...the test vehicle windows and luggage compartments may be closed ...".

6.4.2 Steady State Diurnal Test

The purpose of the steady state diurnal test is to demonstrate control of permeation emissions and to verify proper evaporative emissions system construction.

6.4.2.1 Perform the diurnal test as defined in Subsection 6.4.1 except:

6.4.2.2 Attach vent line(s) to air-port(s) of carbon canister(s) that will direct any air/vapor exiting the canister to the exterior of the test enclosure. This air/vapor need not be measured.

6.4.2.3 The test shall be conducted at a constant temperature of 86° ±3°F.

6.4.2.4 A single steady state 24-hour diurnal is required.

6.4.2.5 Compliance is shown if the emissions measured in this section are lower than the standard and either of the following can be shown:

a) Calculate maximum gasoline vapor loading and show that the carbon canister is operating in the range where it is at least 99.5 percent effective (0.5 percent bleed emissions) based on best modeling practices. The best modeling practices method must be accepted by ARB staff prior to certification or follow the requirements in Appendix A of this test procedure.

b) The OHRV uses a pressure relief valve which does not release vapor from the tank up to 2 pounds per square inch gauge (psig).

c) The OHRV uses a pressure relief valve which does not release vapor from the tank during the second of two consecutive 24-hour diurnal temperature cycles from 72°F to 96°F. The fuel temperature must be below the boiling point for test fuel and the pressure relief valve must not open during both the running loss and hot soak conditioning or it has to vent to the intake.

7 CALCULATIONS: EVAPORATIVE EMISSIONS

Total mass emissions from Subsection 6.4.1 must be calculated using the measurements of initial and final concentrations to determine the mass of hydrocarbons and ethanol emitted pursuant to "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" as amended, March 22, 2012, Parts III.D.11. Alternatively, ethanol measurements may be omitted if the calculated mass of hydrocarbon emissions is multiplied by a percentage adjustment factor equal to:

E10 adjustment factor = (100% - 0.5 x % fuel alcohol content) x (1 + (%ethanol x 3))

(e.g., for E10 adjustment factor = (100% - 0.5 x 10%) x 1.3= 124%)

For OHRVs, the vehicle volume is assumed to be 5 cubic feet (1.42 cubic meters) unless the manufacturer provides a measured OHRV volume.

8 LIST OF TERMS

ARB	California Air Resources Board
ATV	All-Terrain Vehicle
CAD/CAM	Computer-Aided Design/Computer-Aided Manufacturing
C_{C2H5OH}	Ethanol concentration
C_{CH3OH}	Methanol concentration
CCR	California Code of Regulations
CFM	Cubic Feet per Minute
CFR	Code of Federal Regulations
CH&SC	California Health and Safety Code
°C	Degrees Celsius
°F	Degrees Fahrenheit
E10	Commercial Pump Fuel containing 10 percent ethanol
HC	Hydrocarbon
HZ	Hertz
KM/H	Kilometers per Hour
MC	Motorcycle
MPH	Miles Per Hour
OHRV	Off-Highway Recreational Vehicle
PSIG	Pounds per Square Inch – Gauge
T_{liq}	Fuel tank liquid temperature
T_{vap}	Fuel tank vapor space temperature
TP	Test Procedure
TP-933	Test Procedure for determining evaporative emissions from off-highway recreational vehicles
UV	Ultraviolet
UDDS	U.S. EPA Urban Dynamometer Driving Schedule

9 DOCUMENTS INCORPORATED BY REFERENCE

California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, California Environmental Protection Agency, Air Resources Board, El Monte, CA, March 22, 2012.

California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles, California Environmental Protection Agency, Air Resources Board, El Monte, CA, March 22, 2012.

California Exhaust Emissions Standards And Test Procedures For 1997 And Later Off-Highway Recreational Vehicles And Engines, California Environmental Protection Agency, Air Resources Board, El Monte, CA, August 15, 2007.

Control of Emissions from New and In-Use Highway Vehicles and Engines. Title 40, Code of Federal Regulations, Part 86. United States Environmental Protection Agency, Subpart 107-96, 108-79, 108-00, and 508-78.

Reddy, S. Raghuma. Prediction of Fuel Vapor Generation From a Vehicle Fuel Tank as a Function of Fuel RVP and Temperature. SAE Technical Paper 892089, September 25-28,1989. Copyrighted.

Test Procedure for Determining Permeation Emissions from Small Off-Road Engine and Equipment Fuel Tanks, TP-901, California Environmental Protection Agency, Air Resources Board, Sacramento, CA, July 26, 2004.

10 APPENDICES

10.1 Appendix A - Calculation Method for Demonstrating the Adequacies of the Vented Evaporative Emissions System

The calculations in this section are based on the ideal gas law, and equations generated in *SAE 892089- Prediction of Fuel Vapor Generation From a Vehicle Fuel Tank as a Function of Fuel RVP and Temperature* adopted September 25-28, 1989 and incorporated here by reference. All final results should be calculated to two significant figures.

Figure A-1: Calculations Flow Chart

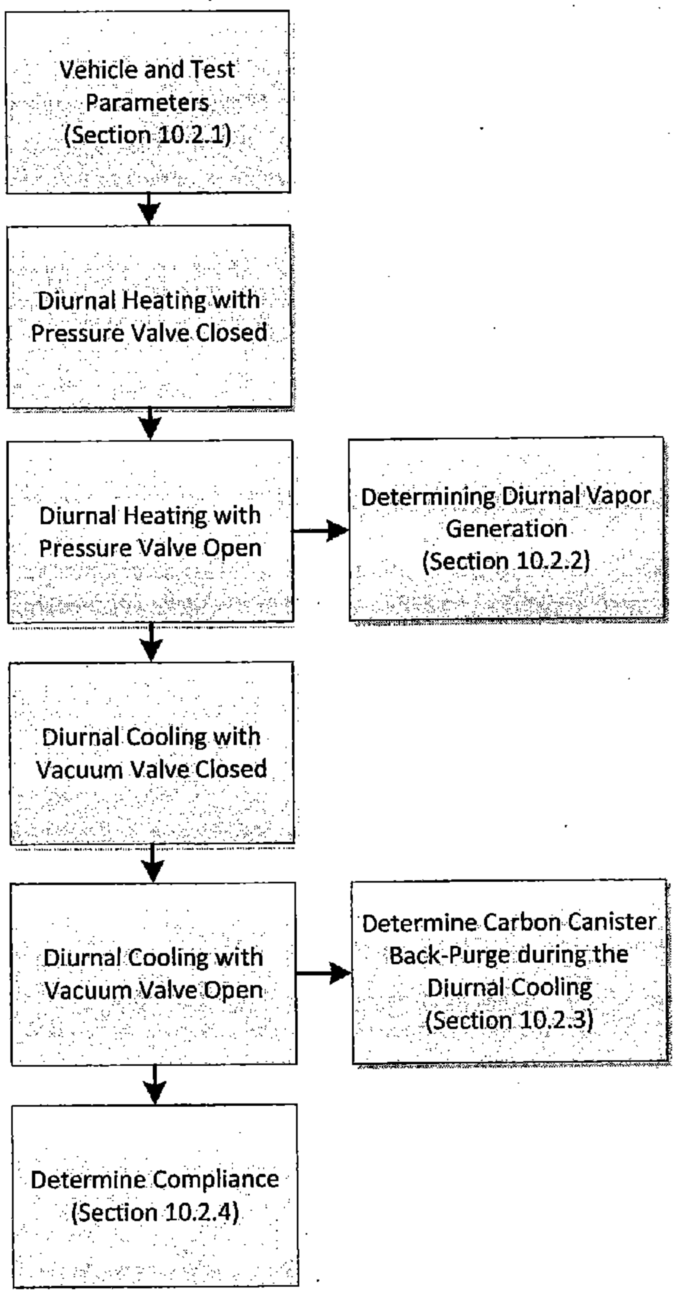
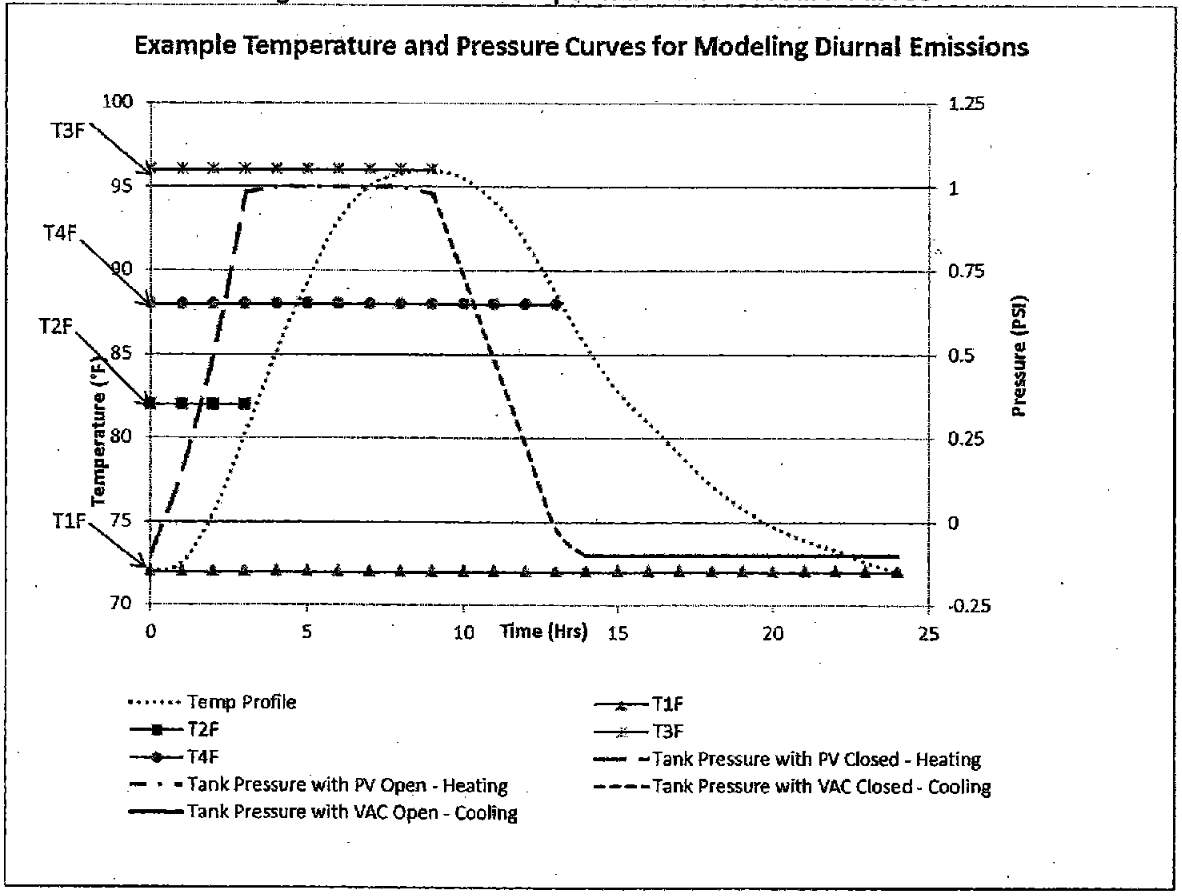


Figure A-2: Diurnal Temperature and Pressure Curves



10.1.1 Vehicle and Test Parameters

a. Fuel Volume Information

________	(gal)	V_t	Total Volume of Fuel Tank
________	(gal)	V_u	Usable Volume of Fuel Tank
________	(gal)	V_i	Initial Fill Volume of Fuel Tank
________	(gal)	V_{FP}	Fuel Used During Prep
________	(gal)	V_{FR}	Fuel Used During Run Loss

EXAMPLE:

2.1	*(gal)*	V_t	*Total Volume of Fuel Tank*
2	*(gal)*	V_u	*Usable Volume of Fuel Tank*
1	*(gal)*	V_i	*Initial Fill Volume of Fuel Tank*
0.1	*(gal)*	V_{FP}	*Fuel Used During Prep*
0.1	*(gal)*	V_{FR}	*Fuel Used During Run Loss*

b. List of Temperatures

T1K = Initial/Final Diurnal Temperature (°K)
T2K = Temperature where Pressure Relief Valve Opens (°K)

T3K = Highest Diurnal Temperature (°K)
T4K = Temperature at which vacuum valve opens (°K)

c. Pressure Control Settings

________	(psig)	P_{VO}	Opening Pressure
________	(psig)	VAC_{VO}	Vacuum Opening Pressure

EXAMPLE:

1	*(psig)*	P_{VO}	*Opening Pressure*
0.1	*(psig)*	VAC_{VO}	*Vacuum Opening Pressure*

d. Fuel Reid Vapor Pressure (RVP)

________	(psi)	RVP

EXAMPLE:

7	*(psi)*	*RVP*

e. Preconditioned Carbon Canister Specifications
The carbon canister must be preconditioned as specified in subsection 5.2. Butane working capacity of a carbon canister must be established at 2-grams break through using "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" as amended March 22, 2012, with the flow rates and temperatures specified in subsection 5.2.

________	(cc)	BV	Carbon Bed Volume
________	(g/canister)	TBWC	Total Equilibrated Butane Working Capacity
________	(g/100cc)	BWC	Butane Working Capacity of Carbon
________	(g/100cc)	GWC	Gasoline Capacity per Volume of Carbon

EXAMPLE:

122	*(cc)*	*BV*	*Carbon Bed Volume*
9.5	*(g/canister)*	*TBWC*	*Total Equilibrated Butane Working Capacity*
7.8	*(g/100cc)*	*BWC*	*Butane Working Capacity of Carbon*
8.2	*(g/100cc)*	*GWC*	*Gasoline Capacity per Volume of Carbon*

f. Determine the Total Gasoline Working Capacity (TGWC) of Canister

The TGWC is the total mass of gasoline vapor that a purged canister can expect to hold. TGWC is determined by direct measurement similar to TBWC but using an aged canister vapor from gasoline at 96°F instead of butane, or by calculating TGWC using canister bed volume, BWC and GWC.

TGWC of Canister

TGWC= TBWC * GWC / BWC = ______*______/______

Where,
GWC, TBWC, BWC = (From Section 10.1.1.e)

EXAMPLE:
*TGWC= 9.5*8.2/7.8 = 10g/canister*

g. Determine Vapor Space Volume of Fuel Tank at end of all Prep Cycles (V_p)

$V_p = V_t - V_i + V_{FP} + V_{FR}$

V_p = _____ – _____ + _____ + _____

Where,
V_t, V_i, V_{FP}, V_{FR} = (From Section 10.1.1.a)

EXAMPLE:

V_p=2.1-1+0.1+0.1=1.3

h. Determine Carbon Canister Gasoline Vapor Capacity at Beginning of Diurnal Test ($TGWC_{di}$)

The carbon canister gasoline vapor capacity at the beginning of the diurnal test is the total mass of gasoline vapor that the canister can expect to hold at the beginning of the diurnal test. $TGWC_{di}$ is determined by direct measurement similar to BWC (Section 6.3.5) but using vapor from gasoline at 96°F instead of butane, or calculate using canister bed volume and measured butane capacity at the beginning of the diurnal test ($TBWC_{di}$).

$TGWC_{di}$ = measured gasoline vapor capacity at beginning of diurnal test
$TGWC_{di}$ = (GWC/BWC)*$TBWC_{di}$ = ______/______*______

$TGWC_{di}$ = _____

EXAMPLE:
$TGWC_{di}$ *Measured to be = 7g*

10.1.2 Determining Diurnal Vapor Generation

Vapor generation occurs as a result of temperature increase of the fuel in the fuel tank. Vapor emissions occur when the generated vapor is able to exit the fuel tank. If the system does not use a pressure relief system, vapor emissions will occur during the entire diurnal heating stage from 72°F to 96°F. If the system uses a pressure relief system, the emissions occur only at temperatures where fuel tank pressures exceed the relief pressure. If such a tank system is employed, the temperature at which the relief valve opens must be determined.

a. Calculate gasoline vapor pressure at lowest temperature of diurnal cycle (72°F or 22.2°C)

Vapor pressure

$$P_{tgasoline}(T1K) = A * T1K * RVP * e^{\frac{-B}{T1K}}$$

Where,
T1K = 22.2° C + 273.2 K = 295.4 K
$A = 25.61$
$B = 2789.78$
RVP = (From Section 10.1.1.d)

EXAMPLE:
$P_{tgasoline}(72°F) = 25.61 * 295.4 * 7 * e^{\frac{-2789.79}{295.4}} = 4.19\ psi$

b. Determine partial pressure of air in the fuel tank at lowest temperature of diurnal cycle.

$P_{air}(72°F) = P_{atm} - VAC_{VO} - P_{tgasoline}(72°F)$

$P_{air}(72°F) =$ _____ – _____ – _____

Where,
P_{atm} = 14.7 psi
VAC_{vo} = (From Section 10.1.1.c)
$P_{tgasoline}$ (72°F) = (From Section 10.1.2.a)

EXAMPLE:
$P_{air}(T1)$ = 14.7 - 0.1 - 4.19 = 10.4 psi

Find the temperature (T2) at which the relief valve opens. This will be where the internal tank pressure equals atmospheric pressure plus the pressure relief valve. If no pressure control system is used T2 equals 72°F.

Solve using numerical analysis to find a value for T2K where:

P_{tank}(pres. Open) = $P_{atm} + P_{vo} = P_{tgasoline}(T2K) + P_{air}(T2K)$

Where,
$P_{tgasoline}(T2K) = A * T2K * RVP * e^{-\frac{B}{T2K}}$
$P_{air}(T2K) = \frac{T2K * P_{air}(T1K)}{T1K}$
RVP = (From Section 10.1.1.d)
P_{vo}= (From Section 10.1.1.c)

EXAMPLE:
Assume T2F is 82°F (301°K)
*$P_{tgasoline}$(301K) = 25.61*301*7*e^(2789.78/301)=5.1 psi*
*P_{air}(301K) = (301*10.4)/295.4 = 10.6*

$P_{tgasoline}$(301K) + P_{air}(301K) = 10.6 + 5.1 = 15.7psi = 14.7+1
Therefore, T2F=82°F

c. Using the Reddy Vapor Generation equation, determine the vapor generation in grams per gallon for a diurnal cycle from T2, for systems with pressure relief, to T3.

$$\text{VAPOR}_{\text{diurnal}} = C * e^{D*RVP} * (e^{E*T3} - e^{E*T2})$$

Where,
$C = 0.00817$
$D = 0.2357$
$E = 0.0409$
T2 (F) = (From Section 10.1.2.c, converted to °F)
T3 (F) = max diurnal (96°F)
V_p = (From Section 10.1.1.g)
RVP = (From Section 10.1.1.d)

Vapor generation for a non-pressurized system using a 72°F to 96°F temperature profile at sea level with 7 RVP fuel simplifies to:.

$\text{VAPOR}_{\text{diurnal}}$= 1.35 g/gal

<u>EXAMPLE:</u>
*$VAPOR_{diurnal}$ = 0.00817*e^(0.2357*7)*(e^(0.0409*96)-e(0.0409*82)) = 0.94g/gal*

10.1.3 Determine Carbon Canister Back-Purge During the Diurnal Cooling

The weight of hydrocarbon vapor back purged (passively purged) from the canister during diurnal cooling steps is a function of the volume of air drawn into the fuel tank as it cools. The amount of air purging the canister will be the difference between the air volume in the fuel tank at the end of cooling less the amount in the tank when the air first begins to enter the tank. In a system that does not employ a pressure relief/vacuum valve system, the flow of air begins as soon as the cooling starts. In a system that employs pressure control, the air flow begins when the in tank pressure equals atmospheric pressure less the opening pressure of the vacuum relief valve. The following calculations provide a calculation method appropriate for either type of system.

a. Calculate gasoline vapor pressure at the highest temperature of the diurnal cycle (96°F or 36.6°C)

Vapor pressure
$$P_{tgasoline}(96°F) = A * T3K * RVP * e^{\frac{-B}{T3K}}$$

Where,
$T3K = 35.6°C + 273K = 308.75K$
$A = 25.61$
$B = 2789.78$

RVP = (From Section 10.1.1.d)

EXAMPLE:

$P_{tgasoline}(96°F) = 25.61 * 308.75 * 7 * e^{\frac{-2789.79}{308.75}} = 6.59\,psi$

b. Determine partial pressure of air in the fuel tank at the highest temperature of the diurnal cycle.

$$\text{Pair}(96°\text{F}) = \text{P}_{\text{atm}} + \text{P}_{\text{vo}} - \text{P}_{\text{tgasoline}}\,(96\text{ F})$$

Where,

Patm = 14.7 psi

P_{vo} = (From Section 10.1.1.c)

P_{air} (96°F) = 14.7+_______-6.59 =

EXAMPLE:

P_{air} (96°F) = 14.7 + 1 - 6.59 = 9.11 psi

Find the temperature (T4) at which the vacuum relief valve opens. This will be where the internal tank pressure equals atmospheric pressure less the vacuum valve setting. This temperature may be found using numerical analysis to determine the temperature where the tank pressure plus the relief valve pressure is equal to atmospheric pressure. If no pressure control system is used this temperature will be 96°F.

$$\text{P}_{\text{tank}}(\text{vac open}) = \text{P}_{\text{atm}} - \text{VAC}_{\text{vo}} = \text{P}_{\text{tgasoline}}(\text{T4K}) - \text{P}_{\text{air}}(\text{T4K})$$

Where,

$$\text{P}_{\text{tgasoline}}(\text{T4K}) = \text{A} * \text{T4K} * \text{RVP} * \text{e}^{-\frac{\text{B}}{\text{T4K}}}$$

$$\text{P}_{\text{air}}(\text{T4K}) = \frac{\text{T4}*\text{P}_{\text{air}}(\text{T3K})}{\text{T3K}}$$

Where,

RVP = (From Section 10.1.1.d)

P_{air}(T3) = (From Section 10.1.3.b)

VAC_{vo} = (From Section 10.1.1.c)

Solve for T4K

T4K = ______

EXAMPLE:

Assume T4F is 88°F (304.1°K)

*$P_{tgasoline}$(304.1K) = 25.61*304.1*7*e^(2789.78/304.1)=5.6 psi*

*P_{air}(304.1K) = (304.1*10)/308.56 = 9.0 psi*

$P_{tgasoline}$(304.1K)+P_{air}(304.1K) = 9.0 + 5.6 = 14.6psi = 14.7 - 0.1

Therefore T4F = 88°F

c. Determine the volume of air in the fuel tank in gallons at the temperature when the vacuum valve opens.

$$V_{air}(T4K) = \frac{V_p * P_{air}(T4K)}{(P_{atm} - VAC_{vo})}$$

Where,
$P_{tgasoline}(T4)$ = (From Section 10.1.3.c)
VAC_{vo} = (From Section 10.1.1.c)
V_p = (From Section 10.1.1.g)

EXAMPLE:
$$V_{air}(T4K) = \frac{1.3 \quad * 9.1}{(14.7\text{-}0.1)} = 0.8 \text{ gal}$$

d. Determine the volume of air in the fuel tank in gallons at the minimum temperature of the diurnal cycle (T1=72°F).

$$V_{air}(T1) = \frac{V_p * P_{air}(T1K)}{(P_{atm} - VAC_{vo})}$$

Where,
$P_{air}(T1) = P_{air}(72F)$ (From Section 10.1.2.b)
VAC_{vo} = (From Section 10.1.1.c)
V_p = (From Section 10.1.1.g)

EXAMPLE:
$$V_{air}(T1K) = \frac{1.3 \quad * \ 10.43}{(14.7-0.1)} = 0.92\, gal$$

e. The volume of air purging the carbon canister in gallons is the difference between these volumes.

$V_{airpurge} = V_{air}(T1) - V_{air}(T4)$

$V_{airpurge}$ = ________ – ________

Where,
$V_{airpurge(cc)} = V_{airpurge} * 3785.4cc/gal$
$V_{air}(T4)$ = (From Section 10.1.3.e)
$V_{air}(T1)$ = (From Section 10.1.3.f)

EXAMPLE:
$V_{airpurge} = V_{air}(T1) - V_{air}(T4)$ =0.92 - 0.8 = 0.12 gal
*$V_{airpurge}(cc)$ = 0.13ga*3785.4cc/gal = 454.2cc*

f. Calculate the purge in carbon bed volume(s).

$$BV_{purge} = \frac{V_{airpurge}(cc)}{BV}$$

Where,
BV = Total Volume of Carbon in Canister (From Section 10.1.1.e)
$V_{airpurge(cc)}$ = (From Section 10.1.3.e)

EXAMPLE:
BV_{purge}= *454.2/120 = 3.8 bed volumes*

The efficiency of the back purge is a function of canister loading or canister saturation. Empirical data must be generated for the conditions at the beginning of the diurnal test.

EXAMPLE:
A purge efficiency of 0.15% of the total canister TBWC per bed volume purged.

$VAPOR_{backpurge} = 0.0015*TBWC*(GWC/BWC)*BV_{purge}$
$VAPOR_{backpurge} = 0.0015*9.4*(8.2/7.8)*3.8 = 0.056g$

Where,
TBWC = (From Section 10.1.1.e)
BWC = (From Section 10.1.1.e)
GWC = (From Section 10.1.1.e)
BV_{purge}= (from Section 10.1.3.g)

10.1.4 Calculating Compliance

a. Total diurnal vapor loading:

$VL_{diurnaltot} = 3*(VAPOR_{diurnal} * V_p) - (2 * VAPOR_{backpurge})$
$VL_{diurnaltot}$ = 3*(_____ * _____) – (2 * _____)

Where,
$VAPOR_{diurnal}$ = (From Section 10.1.2.d)
$VAPOR_{backpurge}$ =(From Section 10.1.3.g)

EXAMPLE:
$VL_{diurnaltot}$= *3*(0.94*1.3)-(2*0.056) = 3.6g*

b. Total Canister Loading is equal to Canister loading prior to diurnal test plus diurnal vapor load:

$VL_{total} = TGWC - TGWC_{di} + VL_{diurnaltot}$

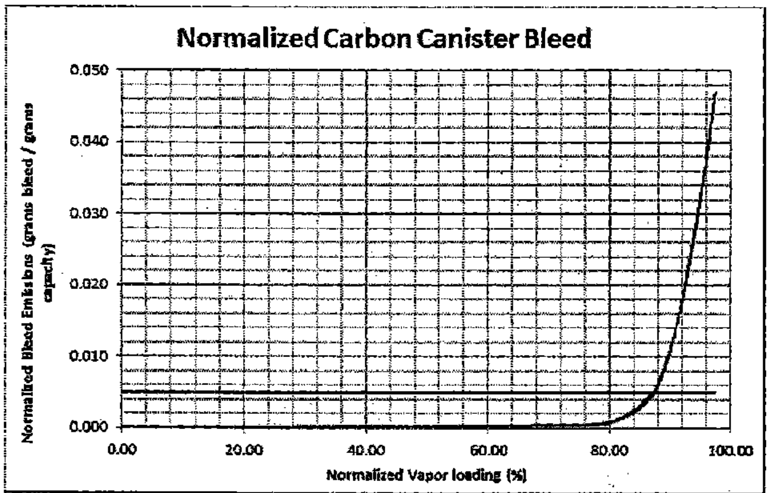
Where,
TGWC = (From Section 10.1.1.f)
$TGWC_{di}$ = (From Section 10.1.1.h)
$VL_{diurnaltot}$ = (From Section 10.1.4.a)

VL_{total} = _______ – _______ + _______ = _______

EXAMPLE:
VL_{total}= *10 – 7 + 3.6 = 6.6g*

Criteria for approval of Certification- A graph similar to the one shown below, but appropriate for the carbon canister actually used, must be submitted. The x axis must show the loading of the canister as a percentage of its working capacity. The y axis must show the bleed emissions in grams of bleed per grams of working capacity when the canister is loaded at the rate defined in Section 5.2.1 (50/50 mixture by volume of butane and nitrogen at a rate of 15 ±2 grams butane per hour per liter of canister volume).

Figure A-3: EXAMPLE plot



Acceptable design (sizing) of the canister shall be demonstrated by a calculated total canister loading (VL_{total}) that is the lesser of 75 percent of the Normalized Loading or that Normalized Loading where the efficiency of the canister to control Bleed Emissions exceeds 0.005 grams of bleed emission / gram of total canister capacity (NVL%).

Normalized Load Limit Percentage:
NVL% = ________
Normalized Load:
NVL = NVL% * TGWC

Where,
TGWC = (From Section 10.1.1.f)

EXAMPLE:
NVL% = 75
*NVL=0.75*10 = 7.5g*

c. The design is acceptable if:

$NVL \geq VL_{total}$

_______ ≥ _______

EXAMPLE:
7.5g ≥ 6.6g......PASS!

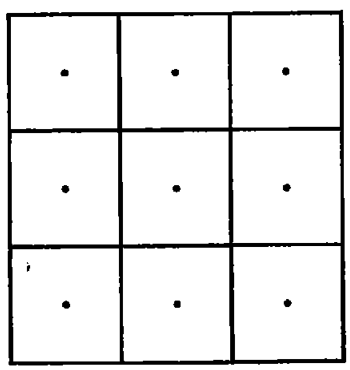
10.2 Appendix B – Variable Speed Cooling Blower

a) Variable speed cooling blower must direct air to the vehicle.
b) Blower outlet must be at least 0.4 square meters (4.31 square feet).
c) Blower outlet must be squarely positioned 0.3 ±0.05 meter (11.8 ±1.97 inch) in front of the vehicle.
d) Blower outlet lower edge height must be 0.1 meter (3.94 inch) to 0.2 meter (7.87 inch) above the ground.
e) Cooling air speed produced by the blower must be within the following limits (as a function of dynamometer roll speed):

Actual dynamometer roll speed	Allowable cooling air speed
0 km/h	0 km/h
Above 0 km/h to 5 km/h	0 km/h to roll speed + 2.5 km/h
Above 5 km/h to 25 km/h	Roll speed ± 2.5 km/h
25 km/h to 80 km/h	Roll speed ± 10 percent
Above 80 km/h	At least 72 km/h

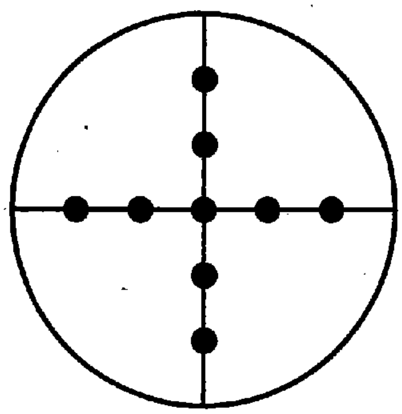
f) The cooling air speed above must be determined as an averaged value of 9 measuring points.
   1) For blowers with rectangular outlets, both horizontal and vertical sides of the blower outlet must be divided into 3 equal parts yielding 9 equal rectangular areas (see the diagram below). The measurement points are located at the center of each rectangular area.

Figure A-4



   2) For blowers with circular outlets, the blower outlet must be divided into 4 equal sectors defined by a vertical line and a horizontal line (see diagram below). The measurement points include the center of the blower outlet and locations on the radial lines (0°, 90°, 180°, and 270°) at radii of 1/3 and 2/3 of the total radius.

Figure A-5



g) In addition to the averaged cooling air speed requirements, each measuring point must be within ± 30 percent of actual roll speeds above 5 km/h.
h) Cooling air speed must be measured linearly at a distance of 0.3 ±0.05 meter (11.8 ±1.97 inch) from the blower outlet.
i) Cooling air speed measurements must be made with no vehicle or other obstruction in front of the blower outlet.
j) Instrument used to measure and verify cooling air speed must have an accuracy of 2 percent.

Attachment C:

Emissions Estimation Methodology for Off-Highway Recreational Vehicles

May 2013

California Air Resources Board

Planning and Technical Support Division

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TABLE OF CONTENTS

I. Executive Summary 1
II. Background 2
A. Purpose and Overview 2
III. EMISSIONS CALCULATION METHODOLOGY 4
A. Methodology 4
1. Exhaust Emissions 4
2. Evaporative Emissions 4
B. Emissions Inventory Inputs 5
1. Active and Inactive Population 5
2. Lifespan by Vehicle Type 6
3. Survival Rate 7
4. Forecasting OHRV Populations by Age 8
5. Load Factors 11
6. Technology and Horsepower Split 12
7. Exhaust Emission Factors 13
8. Evaporative Emission Factors 14
9. Activity 15
10. Correction Factors 17
11. Spatial Allocation 23
12. Benefit of Red and Green Sticker Program 25
13. Seasonality 26
14. Garage Temperature Correction 27
15. Long Term Weathering Correction for Inactive Vehicles 27
16. Methods and Data Used for Estimating the Rule Inventory 28
IV. RV2013 Model 29
A. Calculation Process 29
B. Model Installation and User Guide 30
V. EMISSION RESULTS 30

A. Benefits of Proposed Rule 30
VI. References 32
VII. Appendices 33
APPENDIX A. Estimate of Survival Rate 33
APPENDIX B. Evaporative Emission Factor Calculation Process 37
APPENDIX C. Activity Analysis 39
APPENDIX D. Temperature/RVP Correction 46
APPENDIX E. Benefit of Red and Green Sticker Program 47
APPENDIX F. Garage Temperature Correction 50
APPENDIX G. Adjustment of Emissions from Inactive Vehicles 53
APPENDIX H. Detailed Breakdown of Evaporative Emission Benefits 56
APPENDIX I. Installation and User Guide 57
1. Main User Interface 58
2. Emissions Summary 58
3. Run Model 60
4. Model Code 61
APPENDIX J. Source Code of RV2013 62

LIST OF TABLES

Table I-1. Statewide Summer ROG Emissions Benefits (tons/day) 1
Table III-1. Definition of Active and Inactive Status 6
Table III-2. Total Life of OHRVs 7
Table III-3. Load Factor 11
Table III-4. Summary of Calendar Year, Technology, and Horsepower Split Bins 13
Table III-5. Exhaust Emission Factors for RV2013 14
Table III-6. Evaporative Emission Factors for RV2013 15
Table III-7. Annual Activity for OHRVs 16
Table III-8. Coefficients for Temperature Correction 21
Table III-9. Conversion Factors for THC, TOG and ROG 22
Table III-10. Coefficients Used for CH4 Conversion from TOG 22
Table III-11. Coefficients Used for Fuel Consumption Calculation 23
Table III-12. Summary of Spatial Allocation for Recreation Vehicles 25
Table III-13. Proposed Evaporative Controls for OHRV 28
Table III-14. Emission Factors Based on the Proposed Rule 29
Table V-1. Benefits of the Proposed Rule for Summer Emissions (tons/day) 31
Table VII-1. OMC Population from DMV 34
Table VII-2. Survival Ratios Estimated from DMV Data 34
Table VII-3. Survival Rate (Percent) of OHRVs 36
Table VII-4. Percentage of Hot Soak Emissions by Duration (ARB) 38
Table VII-5. Percentage of Hot Soak Emissions by Duration (ATL) 38
Table VII-6. Activity by Age for OHRVs 45
Table VII-7. California Nonattainment Area Based on Federal 8-hour Ozone Standards 49
Table VII-8. Sierra Research Study of 13 Garage Temperature Profiles 50
Table VII-9. ARB Garage Temperature Study 50
Table VII-10. Summary of Ratios of Garage Temperature to Ambient Temperature 51
Table VII-11. Final Criteria and Ratio Used in Estimating Garage Temperature 51
Table VII-12. Temperature Range in Los Angeles County 54
Table VII-13. Emissions Estimated from Weathered and Un-weathered Conditions 55

LIST OF FIGURES

Figure III-1. OMC Population Data from DMV 7
Figure III-2. Survival Rate of OMCs 8
Figure III-3. OMC California Annual Sales and Nationwide New Housing Starts 9
Figure III-4. Comparison of OMC Annual Sales between RV2013 and MIC 10
Figure III-5. Population Growth of OMC 11
Figure III-6. G2/G4 Trend from Certification Data and Polk Model 12
Figure III-7. Activity by Age for OMCs, ATVs, and Mini Bikes 17
Figure III-8. Spatial Allocation for OMCs* 24
Figure VII-1. ATV Activity from CSUS Survey 40
Figure VII-2. Comparison of ATV Activity from Survey and Warranty Data 40
Figure VII-3. OMC Activity from CSUS Survey 41
Figure VII-4. Snowmobile Activity from Internet Sales Data 42
Figure VII-5. Mini Bike Activity from CSUS Survey 43
Figure VII-6. Golf Cart and Specialty Vehicle Activity 44
Figure VII-7. Estimated Monthly HC Emission Rate from Vapor-Liquid Equilibrium 54
Figure VII-8. Detailed ROG and NOx Emission Benefits for State and Local Districts (TPD) 56

I. EXECUTIVE SUMMARY

Off-highway OHRVs (OHRVs) are integrated into a single regulatory category including off-road motorcycles (OMC), all-terrain vehicles (ATV), off-road sport vehicles, off-road utility vehicles, sand cars, and golf carts, as defined in Cal. Code Regs., tit. 13,§ 2411(a). The California Air Resources Board (ARB) has developed a regulation to control evaporative emissions from gasoline-powered OHRVs in order to satisfy the 2007 State Implementation Plan (SIP) commitment to reduce ROG emissions from OHRVs.

To support the proposed rule, ARB staff has developed an emissions inventory model, RV2013, to estimate emissions generated by OHRVs in each region of the State. This inventory revision builds on previous ARB assessments, and contains updates to vehicle population, activity (hours/year or miles/year), annual vehicle sales, emission factors, technology change from carbureted (CARB) to fuel injected (FI) engines, as well as the change in the population split between two and four stroke engines. These factors were adjusted to account for the effects of the economic recession that began in December 2007 as well as the expected recovery of California's economy over the next twenty years.

Table I-1 provides a summary of the statewide OHRV emissions inventory for three critical air quality attainment deadlines in California: 2020, 2023, and 2035. Based on the emissions estimate from RV2013, the baseline statewide summer ROG emissions from OHRV operating in California in 2020, 2023, and 2035 are 17.35 tons per day (TPD), 17.38 TPD, and 19.08 TPD, respectively. Taking into account the benefits of the proposed rule, the statewide summer ROG from OHRV in 2020, 2023, and 2035 is estimated to be 16.01 TPD, 14.03 TPD, and 9.17 TPD, respectively.

Because of the relatively long useful life of OHRVs and the near-term downturn in sales of new OHRVs related to the recession, emissions benefits from this proposed rule will increase further into the future as a larger fraction of the existing OHRV population operating in California turns over to newer vehicles that meet the more stringent emissions requirements. Staff estimates that with the proposed ARB regulation on evaporative controls, the emission benefits will be 1.34, 3.35, and 9.91 TPD by 2020, 2023, and 2035, respectively.

Table I-1. Statewide Summer ROG Emissions Benefits (tons/day)

	2020			2023			2035		
	Exhaust	Evap	Total	Exhaust	Evap	Total	Exhaust	Evap	Total
RV 2013	4.85	12.50	17.35	4.38	13.0	17.38	3.96	15.12	19.08
RV 2013 with Proposed Rule	4.85	11.16	16.01	4.38	9.65	14.03	3.96	5.21	9.17
Benefits	0	1.34	1.34	0	3.35	3.35	0	9.91	9.91

II. BACKGROUND

OHRVs are a significant source of ROG, which is an important precursor to ozone formation in the atmosphere. To reduce ozone levels and comply with ambient air quality standards, ROG reductions are necessary. The proposed new evaporative emissions standards for OHRVs will help reduce ambient ozone levels.

Previously, OFFROAD2007 was ARB's off-road emissions inventory model used to estimate emissions from different off-road sources such as OHRVs, lawn and garden equipment, pleasure craft, construction equipment, and other types of off-road equipment. As part of this rulemaking, staff has replaced OFFROAD2007 with a stand-alone Microsoft Access-based model, RV2013, to estimate the OHRV emissions inventory. RV2013 has grouped these OHRVs into five categories: off-road motorcycles (OMC), all-terrain vehicles (ATV), mini bikes, snowmobiles, and golf carts/specialty vehicles. Staff has included updated information on OHRVs' population, activity, growth projections, and emission factors.

A. PURPOSE AND OVERVIEW

This document describes the new data, methodologies, and assumptions that were applied in RV2013 as well as the steps taken to estimate the emission benefit for the proposed rule. The following presents a brief overview of the new data and methodologies used to develop the revised OHRV inventory:

- Base Vehicle Population and Model Year Distribution (2000 to 2010)

  Updated California Department of Motor Vehicle (DMV) registration data provide detailed information on the total population and model year distribution of that population for each calendar year between 2000 and 2010. The database also allows us to estimate vehicles that are actively used (active vehicles) as well as vehicles that may be stored at households but not used (inactive vehicles).

- Forecasting Vehicle Populations and Age Distributions (2010 to 2035)

  Staff used DMV registration data to reevaluate the projected lifecycle of each vehicle type, and to estimate the expected total life, half-life (or useful life), and year-to-year survival rate by vehicle type.

- Forecasting New Vehicle Sales

  Staff developed a new method to forecast new vehicle sales by vehicle type as a function of near-term forecasted economic trends and long term demographic trends.

- Technology Shifts

  Staff used the DMV database to decode the vehicle identification number (VIN) to determine the engine type for each registered vehicle. The technology associated for both two-stroke and four-stroke engines was then forecast into the future.

- Activity

  In 2009, ARB-funded a California State University Sacramento (CSUS) phone survey of over 1,127 respondents (CSUS, 2009). Staff corroborated the results of the survey with other data sources to develop estimates for OHRV use by age and vehicle type.

- Emission Factors

  Staff updated and simplified emission factors based on certification data, vehicle testing, and other testing and analysis. Updates include:

  - Updated evaporative emission factors based on new evaporative test data for diurnal, resting, and hot soak emissions.
  - Updated snowmobile exhaust emission factors based on in-use test data.
  - A weathering correction to account for decreasing fuel volatility in inactive vehicles assumed to experience a full year of diurnal/resting emissions without use or refueling.

- Spatial Allocation

  Exhaust and evaporative emissions that occur during vehicle operation (running loss and hot soak) were allocated to area of operation (based on the 2009 CSUS survey). Other evaporative emissions (diurnal and resting loss) were allocated to area of storage (based on DMV registration data).

- Red and Green Sticker Program

  Staff estimated the emission benefits from the Red and Green Sticker Program using a simplified approach that assumes that about 50% of red sticker vehicles will not operate in nonattainment areas during the summer ozone season.

- Correction Factors

  - Temperature/Reid Vapor Pressure (RVP) correction is used to scale down the one-day diurnal and resting loss evaporative emissions from the laboratory testing conditions of 65°F to 105°F to temperature conditions more representative of what OHRVs experience under real-world storage and operating conditions in different parts of California. The revised temperature/RVP correction is based on normalized calculation of vapor generation and permeation.
  - Relative humidity correction for oxides of nitrogen (NO_X) is based on the 24-hourly average of humidity.
  - Exhaust temperature correction is based on the hourly average of ambient temperatures measured between 9 a.m. to 4 p.m. to better reflect the temperatures the vehicles are experiencing during their peak operating hours.

III. EMISSIONS CALCULATION METHODOLOGY

In this section, staff describe the data sources, methodology, assumptions, and algorithms used in developing the emissions inventory. Topics that required more detailed explanation are included in the appendices in Section VI.

A. METHODOLOGY

1. *Exhaust Emissions*

Exhaust emissions are a function of the number of vehicles operating in a given area, the amount of activity assumed by vehicle type and age, and region-specific emission factors. Exhaust emissions generated by OMCs and ATVs are calculated as follows:

$$P_{i,y,r} = \sum Pop_{i,v,r} * EF_{i,v,r} * Miles_{i,v}$$

Snowmobiles, golfcarts, and specialty vehicle exhaust emissions are calculated as follows:

$$P_{y,r} = \sum Pop_{v,r} * EF_{v,r} * Hrs_{i,v} * Avg\ Hp_i * Load\ Factor_i$$

Where,

P	= pollutant (ROG, TOG, CO, NO_X, PM, CO_2)
Pop	= equipment population
EF	= emission factor
Miles	= annual average mileage
Avg. Hp	= average horsepower
Load factor	= load factor
Hrs	= annual average use hours
y	= scenario year (1990-2035)
i	= equipment type
v	= vintage (age of equipment)
r	= region and season

2. *Evaporative Emissions*

The evaporative emissions inventory is separated into four distinct processes: diurnal, resting loss, hot soak, and running loss. Evaporative emissions generally occur through the permeation of fuel through plastic and rubber components of the engine and fuel delivery system of a vehicle. Note that the definition of diurnal in a regulatory context represents the sum of the diurnal and resting loss processes.

a. <u>Diurnal emissions occur in equipment that is not being used, when rising ambient temperature causes fuel evaporation from engines and gas tanks throughout the day.</u>

b. <u>Resting loss emissions occur while the equipment is not being used, and are generated when the ambient temperature is either stable or declining during the day and evening.</u>

c. <u>Hot soak emissions occur after an engine is shut off, as the temperature of equipment and fuel delivery systems gradually return to ambient temperatures.</u>

d. <u>Running loss emissions occur while the equipment is operating and the temperature of the equipment and fuel delivery systems is above ambient temperature.</u>

The basic equations for estimating evaporative emissions are provided below:

$$\text{Diurnal/Resting} = \text{Population} * \text{EF}_{\text{Diurnal/Resting}} * \text{Temp/RVP Correction}$$

$$\text{Hot Soak} = \text{Population} * \text{EF}_{\text{Hot Soak}} * \text{RVP Correction}$$

$$\text{Running Loss} = \text{Population} * \text{EF}_{\text{Running Loss}} * \text{Activity} * \text{RVP Correction}$$

Where,

$\text{EF}_{\text{Diurnal/Resting}}$	= gram per day for diurnal and resting losses
$\text{EF}_{\text{Hot Soak}}$	= gram per event of hot soak
$\text{EF}_{\text{Running Loss}}$	= grams per hour of running loss
Activity	= usage in hours per year
RVP Correction	= Reid vapor pressure correction factor (region specific)
Temp/RVP Correction	= Temperature and RVP correction factor (region specific)

B. EMISSIONS INVENTORY INPUTS

1. *Active and Inactive Population*

Staff used 2000 to 2010 calendar year DMV registration data to update the OHRV population. As shown in Table III-1, DMV has designated different codes to reflect the current usage of the vehicle. Based on the DMV's definition, staff has divided the OHRV population into two groups: "active" and "inactive." For active vehicles, both exhaust and some evaporative emissions (hot soak and running loss) occur where the vehicles are operated such as state parks. All vehicles, whether active or inactive, generate evaporative diurnal and resting emissions where they are stored, which is assumed to be each vehicle's registered address.

Generally speaking, about 80% of all vehicles appearing in the DMV database are currently registered or in the process of being registered. For this assessment, we assume vehicles with a DMV code of N, P, or R in the registration database are still present at their registered address, but are not going to be used during the year. We call these "inactive" vehicles.

Table III-1. Definition of Active and Inactive Status

DMV code	Definition	Status
C	Currently registered	Active
E	Evidence of use	Active
S	Pending	Active
N	Not currently registered	Inactive
P	Planned non-operational	Inactive
R	Prior history	inactive

2. *Lifespan by Vehicle Type*

We define the total life of a vehicle type from the time a population of vehicles is manufactured in a given year to the time all of those vehicles have been scrapped. We define the useful life as the time a population of vehicles is manufactured to the time half of all vehicles in that population would be scrapped. This assessment is conducted on a vehicle type-specific basis, based on DMV registration data for active and inactive vehicles. We assume vehicle lifespans as derived from DMV registration data also represent the total life of each engine in each vehicle. As a result, we do not assume engines are rebuilt or replaced during a vehicle's life span.

In RV2013, the total life of each vehicle type is estimated directly from DMV raw data. Figure III-1 shows that OMCs operating in California have a total life of about 40 years but that the age distribution is strongly skewed towards vehicles that are 10 years and younger. This reflects OMCs being scrapped as they age and is consistent with age distributions seen in other vehicle classes including on-road vehicles. Also of note is the spike in vehicles around 20 years of age, likely reflecting a surge in new OMC sales in the mid-1980s. Finally, the series of curves shown here reflect show the age distribution for a cohort of vehicles changes with time due to scrappage and other factors.

Similarly, for other OHRV categories, staff used the age distribution of the raw DMV data and estimated their total life. Table III-2 provides a summary of the total life estimated from the DMV data. For ATVs, OMCs, snowmobiles and mini bikes, the total life is 40 years. For golf carts and specialty vehicles, the total life is 50 years.

Figure III-1. OMC Population Data from DMV

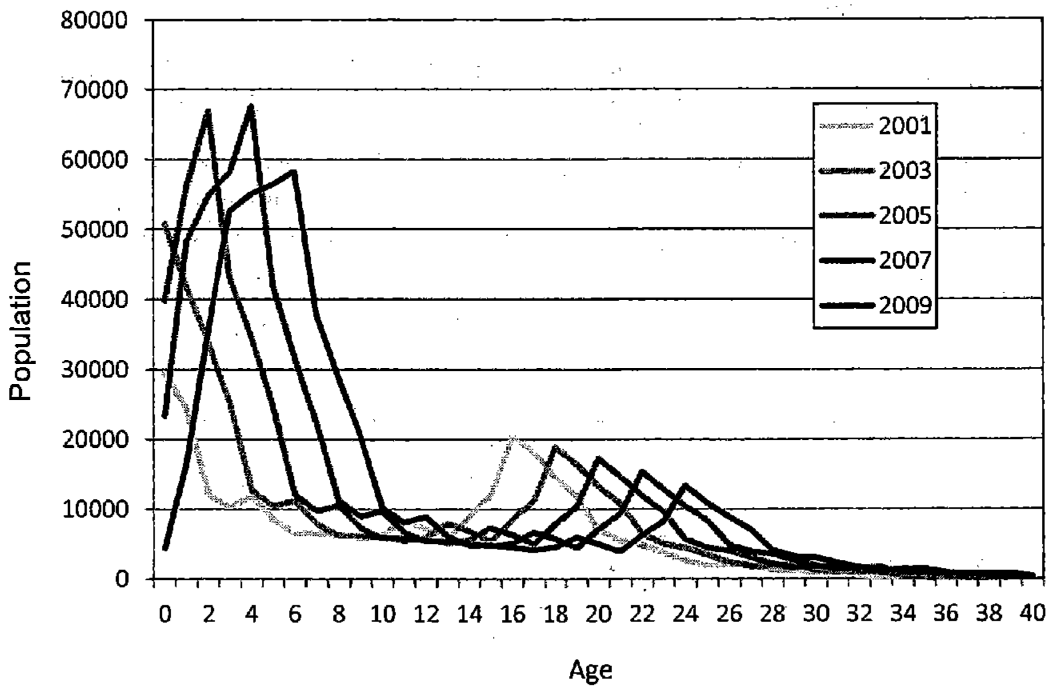


Table III-2. Total Life of OHRVs

Vehicle Type	Total Life (year)
OMC	40
ATV	40
Mini Bike	40
Snowmobile	40
Golf Cart & Specialty Vehicle	50

3. *Survival Rate*

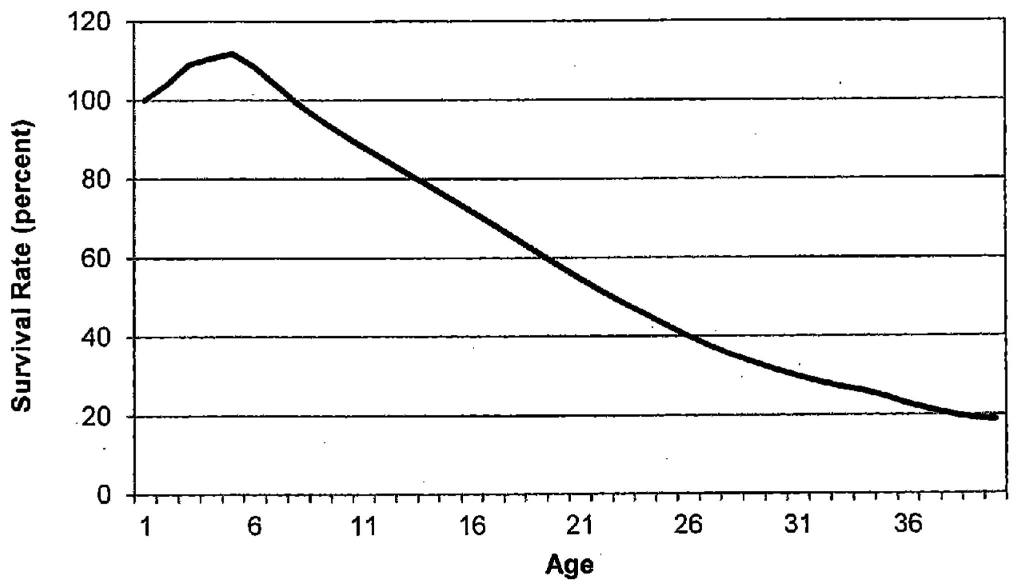
A survival rate, or survival curve, is used to model the rate at which a population is scrapped over time. To determine a survival rate by vehicle type, staff evaluated year-to-year changes in 10 years of DMV registration data. In particular, by tracking a specific population through two calendar years, staff were able to estimate a survival ratio on a year-to-year basis. For example, there are significantly fewer 6 year old OMCs in the 2009 calendar year DMV database than there were 4 year old OMCs in the 2007 calendar year DMV database, reflecting scrappage of vehicles (or vehicles moving out of state) between those two calendar years (as shown in Figure III-1).

In theory, the survival ratio should decline starting from the first year the vehicle is sold. However in practice we sometimes see trends where the vehicle population initially increases before it begins to decrease due to attrition. In the case of OHRVs, we believe, based on analysis of 10 years of DMV registration data, newly manufactured vehicles are sold over the course of several years rather than just in the year manufactured. This trend is reflected in our survival rate estimates.

Appendix A provides our detailed calculation process for estimating the survival rate as well as a summary of survival rates for all OHRV categories.

Figure III-2 presents the survival rate for OMCs to illustrate the typical trend we observed for OHRV survival rates in the DMV registration data. As discussed earlier, the OMC survival rate actually increases until about age 5, and then decreases.

Figure III-2. Survival Rate of OMCs



4. *Forecasting OHRV Populations by Age*

OHRV population growth is determined from two factors: incoming population as estimated by annual sales and the scrapped population as estimated by the survival rate. This is shown in the equation below.

New Population = Old Population + New Vehicle Sales – Scrapped Population (for each age)

In the following example, we discuss the method we used to estimate the growth of annual OMC sales. Estimating future annual sales of OHRVs is a challenging task, as no direct forecasts for OMCs are available. To estimate future sales, we found that robust OHRV purchases generally correlate well with favorable economic conditions. Specifically, staff found there is a good correlation between historical annual vehicle sales data in California (based on 2000 to 2010 DMV data) with historical nationwide new housing starts over the same period. As shown in Figure III-3, there is a good correlation between annual sales of OMCs and the nationwide new housing starts. We used forecasted nationwide new housing starts as a surrogate to forecast the future annual sales of OMCs.

Nationwide housing start data and forecasts were obtained from the 2012 UCLA economic forecast, and used to forecast to 2017, when the economy is assumed to have fully recovered from the 2009 to 2010 economic recession (UCLA, 2012). From 2011 to 2017, OMC annual sales were estimated using the new housing starts as surrogates as shown in Figure III-4. For 2018 and beyond, the OMC annual sales were estimated using the historical California human population growth of 1.2%. As shown in Figure III-4, we expect that as California's economy recovers and individuals have more disposable income, OHRV sales will begin to recover from the lows seen in 2010. By 2017, we estimate that annual sales will be comparable to what was seen around 2000.

To check if the back-cast annual sales growth was reasonable, staff obtained annual OMC sales data from Motorcycle Industry Council (MIC) to compare with the output from RV2013. Past annual sales OMC sales from 1999 to 1999 to 2000 is back-casted from 2000 DMV data and estimated survival rate. Generally speaking, the back-casted data are in good agreement with the MIC annual sales data.

Figure III-3. OMC California Annual Sales and Nationwide New Housing Starts

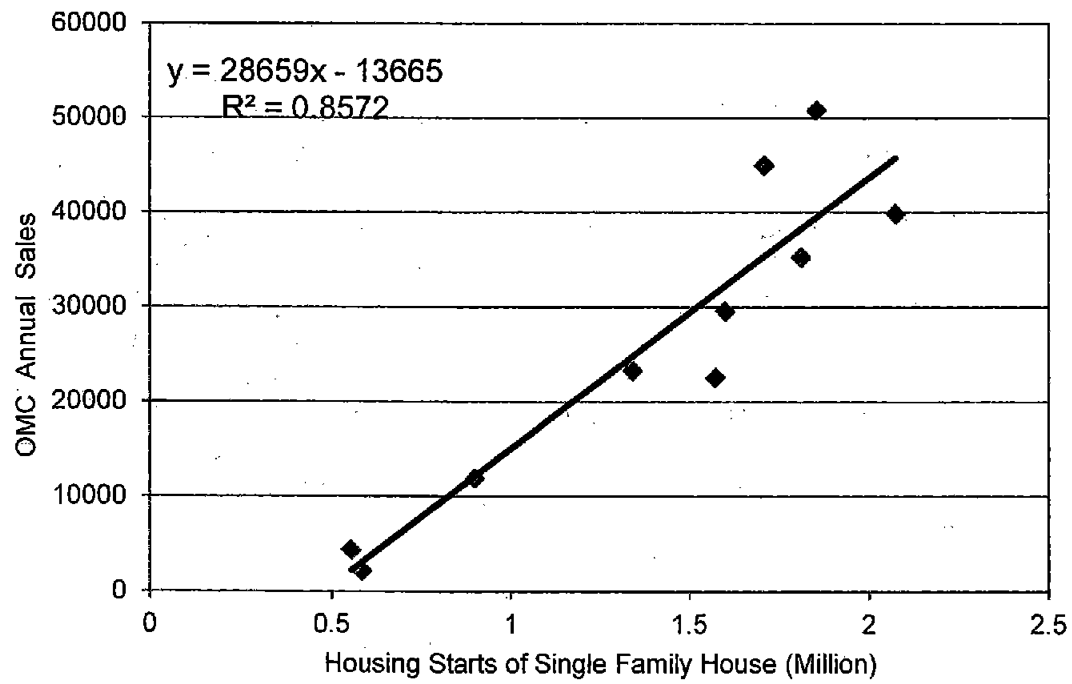


Figure III-4. Comparison of OMC Annual Sales between RV2013 and MIC

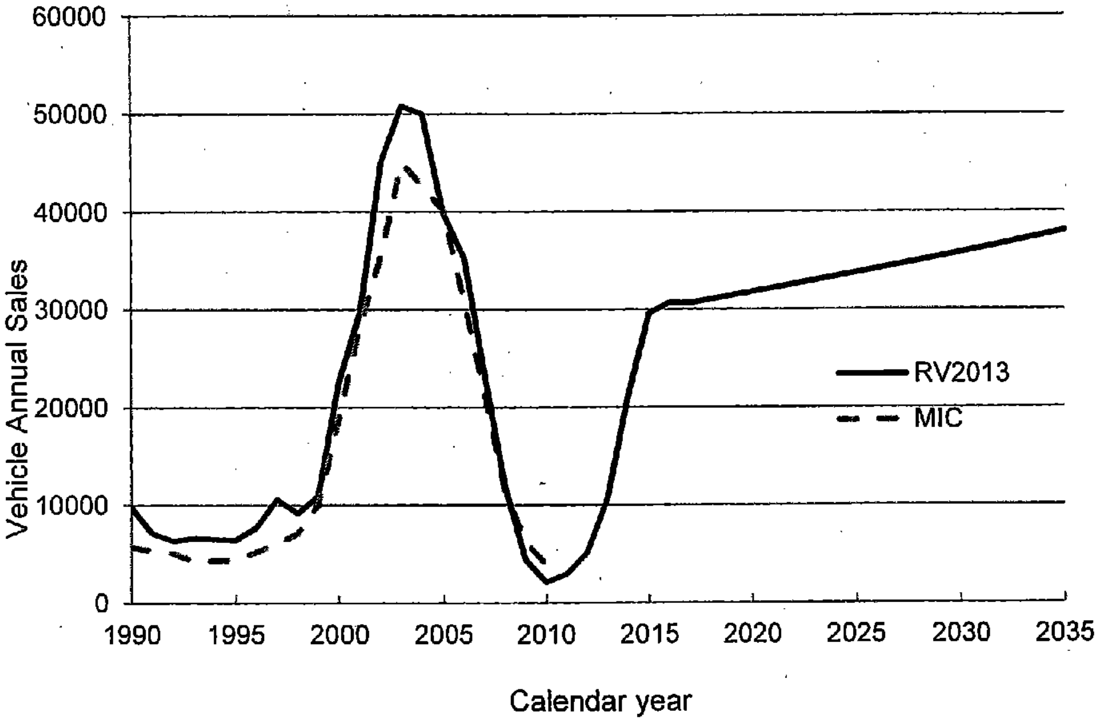
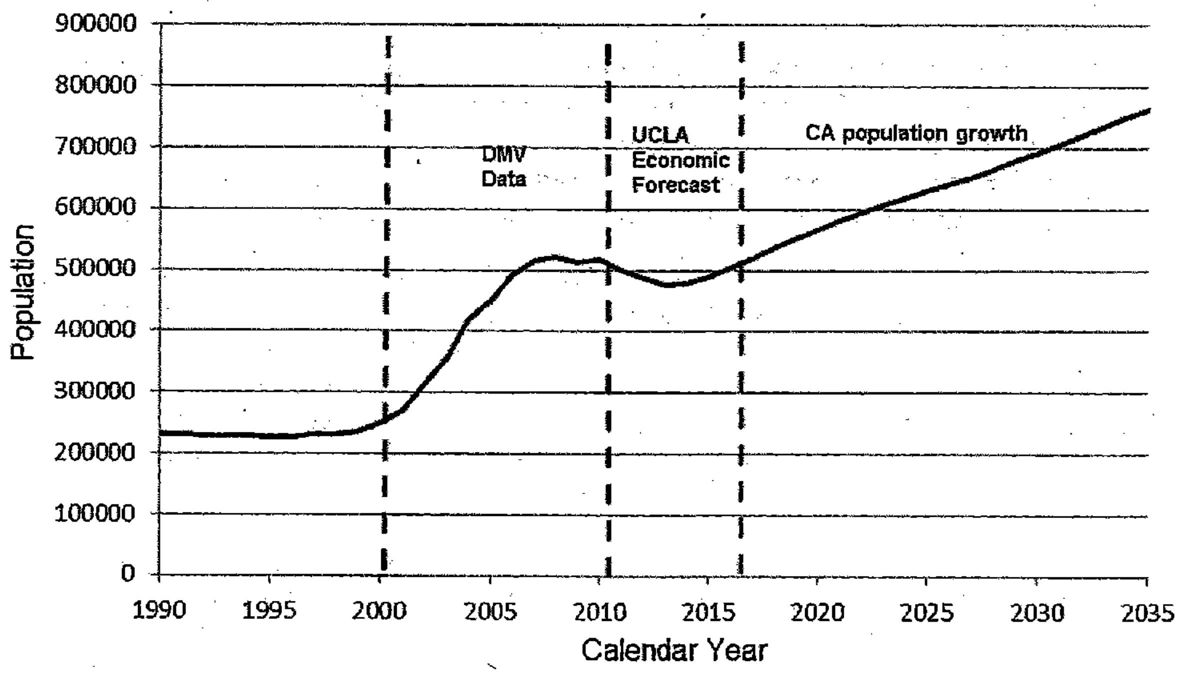


Figure III-5 shows the historic, as well as projected, trend in the overall OMC population in California between 1990 and 2035, taking into account actual and estimated future vehicle sales, assumptions about OMC survival rate; and forecasts of California's future economic and human population growth. Note that the OMC population from 2000 to 2010 is based on actual DMV registration data while the OMC population for calendar years 1999 to 1990 is back-casted from 2000 using assumed survival rates. As shown in Figure III-5, the OMC population started to decline in 2008 with the economic recession. This reduction was caused by a massive decline in new vehicle sales coupled with on-going fleet attrition as vehicles aged and were scrapped. By 2014, we estimate the total population of OMCs operating in California will start to grow again as new vehicle sales driven by a recovering economy and human population growth outpace fleet attrition.

Figure III-5. Population Growth of OMC



5. *Load Factors*

Engine load is the average operational level of an engine in a given application as a fraction or percentage of the engine manufacturer's maximum rated horsepower. Since emissions are directly proportional to engine horsepower, load factors are used in the inventory calculations to adjust the maximum rated horsepower to the horsepower levels typically observed during normal operation.

Because exhaust emissions from OMCs, ATVs, and mini bikes are based on certification testing results conducted on the Urban Dynamometer Driving Schedule (UDDS) test cycle and reported in grams per mile, a load factor is not used for calculating emissions from these vehicles. Staff did not conduct any studies on the load factors of OHRVs such as snowmobiles, golf carts, and specialty vehicles. The load factors used in RV2013 were based on data provided by Power System Research (PSR) in 1996 and are shown in Table III-3. These load factors are consistent with what was used in OFFROAD2007.

Table III-3. Load Factor

Vehicle Type	Load Factor	Data Source
Snowmobiles	0.34	PSR
Golf Carts and Specialty Vehicles	0.46	PSR

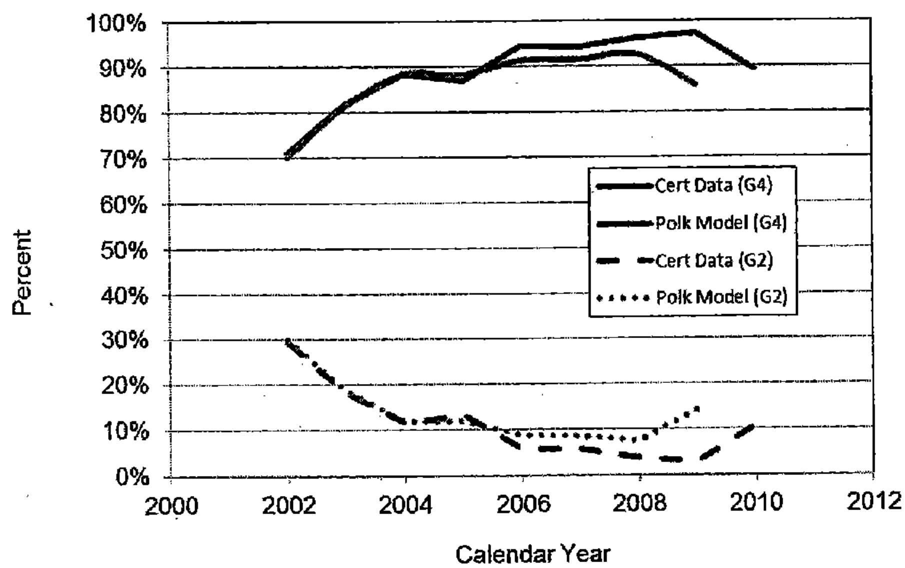
6. *Technology and Horsepower Split*

Engine technology definitely has an impact on exhaust and evaporative emissions. For instance, a two-stroke gasoline engine (G2) produces more hydrocarbon (HC) exhaust compared to a four-stroke gasoline engine (G4). In RV2013, all vehicles are categorized as either two-stroke gasoline (G2) or four-stroke gasoline (G4) engines. Because of a lack of data on what fraction of engines are fuel-injected, staff assumed that for both G2 or G4 technology types, 50% of engines are carbureted and 50% are fuel-injected.

Staff applied the Polk Model (Polk VINtelligence) to estimate the G2/G4 split by decoding the vehicle identification number that is provided for each OHRV in the DMV registration data (POLK, 2013). As DMV data are available only for calendar years 2000 to 2010, staff assumed that for calendar year 2000 and earlier, the G2/G4 split was the same as for calendar year 2000. Likewise, the G2/G4 split for calendar year 2010 and later is assumed to be same as for calendar year 2010.

Staff compared the calendar year-specific G2/G4 split obtained from applying the Polk Model to the DMV registration data with the G2/G4 split obtained from analysis of certification data provided to ARB. As shown in Figure III-6, the G2/G4 trend from the certification data and Polk Model are in good agreement with the fraction of G2 engines found in OHRV operating in California declining from about 30% of the total in 2002 to about 10% in 2010.

Figure III-6. G2/G4 Trend from Certification Data and Polk Model



As shown in Table III-4, the RV2013 model bins OHRVs into different calendar year, technology and horsepower groups for the purpose of assigning emission factors. Due to the limited availability of emissions test data and certification data, carbureted and fuel injected engines may be assigned the same emission factors within a given technology group such as G2 or G4.

Generally speaking, in RV2013, emission factors are assumed to be the same regardless of different horsepower groups. However, horsepower is subdivided into five groups in order that each horsepower group may have a different emission factor when more test data are available in future.

Table III-4. Summary of Calendar Year, Technology, and Horsepower Split Bins

Calendar Year	Technology	Horsepower (hp)
1999 and before	2-Stroke Carbureted (G2 CARB)	0 to 5
2000 to 2010	2-Stroke Fuel Injected (G2 FI)	5 to 15
2010 and later	4-stroke Carbureted (G4 CARB)	16 to 25
	4-Stroke Fuel Injected (G4 FI)	26 to 50
		51 to 120

7. *Exhaust Emission Factors*

Exhaust emission factors used in RV2013 are consistent with OFFROAD2007 and based on certification data and adopted exhaust emissions standards. As OMCs and ATVs were tested on the Urban Dynamometer Driving Schedule (UDDS), which was designed primarily for passenger vehicles and light duty trucks, these exhaust emission factors do not represent the typical trail driving conditions experienced by OMCs and ATVs. One study, conducted by CE-CERT at the University of California at Riverside, focused on real-world driving conditions for OMCs, ATVs, and mini bikes (Durbin et al.,2004). The study provided the average speed, miles driven per day, hours of operation per day, and fuel economy reported by a group of OMC and ATV users. After analyzing the results of the CE-CERT study, staff determined that the average fuel use reported in the CE-CERT study was about three times higher than fuel use measured for comparable vehicles tested on the UDDS. Staff applied an external adjustment factor to revise the baseline CO_2 emission factors, but did not apply such an adjustment to criteria pollutants. The impact of real-world driving conditions on OMCs and other OHRVs is an issue that requires further study; ARB is currently developing test plans to better understand this impact. Table III-5 presents a summary of exhaust emission factors currently used in RV2013.

Table III-5. Exhaust Emission Factors for RV2013

Vehicle Type	Tech Group	HP	Model Year	HC	CO	NOX	PM	CO2
OHMC (g/mile)	G2	All	All	34.2	54.1	0.01	0.42	79.58
	G4	All	1997 and before	3.59	39.1	0.49	0.06	79.58
			1998 and later	0.68	19.8	0.64	0.06	79.58
ATV (g/mile)	G2	All	All	34.2	54.1	0.01	0.42	109.63
	G4	All	1997 and before	3.59	39.1	0.64	0.06	109.63
			1998 and later	0.68	19.8	0.49	0.06	109.63
Mini Bike (g/mile)	G2	All	All	34.2	54.1	0.01	0.42	79.58
	G4	All	1994 and before	24.25	488.1	2.03	0.71	79.58
			1995-1998	8.68	300	2.8	0.75	79.58
			1999 and later	0.47	100	2.7	0.25	79.58
Snowmobile (g/bhp-hr)	G2	All	2005 and before	140.7	385.1	0.54	2.3	615
			2006	89.75	246.1	0.54	2.3	615
			2007-2009	74.5	205	0.54	2.23	615
			2010 and later	55.9	205	0.54	1.57	615
	G4	All	All	3.5	59.3	6.57	0.2	615
Golf Cart & Specialty Vehicle (g/bhp-hr)	G2	0 - 5	All	92	145.5	0.03	1.13	446.2
		>5	All	63.27	100.09	0.02	0.78	446.2
	G4	0 - 5	1997 and before	14.6	159.1	2.6	0.24	446.2
			1998 and later	2.77	80.59	1.99	0.24	446.2
		>5	1997 and before	6.64	72.33	1.18	0.11	446.2
			1998 and later	1.26	36.63	0.91	0.11	446.2

Note that CARB and FI are included in both G2 and G4

8. *Evaporative Emission Factors*

ARB has been active in collecting evaporative emissions data from OHRVs. In 2003, ARB contracted with Automotive Testing Laboratory (ATL) for testing of evaporative emissions from OHRVs using a Sealed Housing for Evaporative Determination (SHED). In addition, ARB began testing OHRVs in ARB's SHED in El Monte, California to support development of this proposed regulation. The goal of the testing was to determine baseline evaporative emissions for a wide range of OHRV equipment and blends of gasoline with different ethanol fuel contents.

For each vehicle tested, the evaporative emissions were measured for hot soak, running loss, diurnal, and resting loss processes. Staff analyzed the results of the ATL and ARB in-house testing to develop the evaporative emission factors by model year group shown in Table III-6. The detailed calculation process is described in Section VI. B.

While analyzing the data from evaporative tests including hot soak, diurnal and resting, and running loss, staff also recognized some sources of uncertainty in estimating the evaporative emission factors, listed as follows:

a. CARB and FI engines used in OHRV applications are assumed to have the same evaporative emission rates due to the lack of emissions data currently available for FI vehicles. From a practical perspective, FI engines should have lower evaporative emission rates than CARB engines because FI systems are sealed whereas carbureted engines have an air intake open to the atmosphere.

b. Evaporative testing is generally more difficult to conduct than exhaust testing as vehicle fuel systems can have many sources for hydrocarbon emissions including the fuel system hoses, hose fittings, fuel tank, carburetor opening, and even liquid leaks. Subsequently, there is typically higher test to test variability when measuring evaporative emissions compared to exhaust emissions.

c. It is reasonable to assume, based on observations of on-road passenger vehicles, that a small percentage of the OHRV population have leaks in their fuel systems (so-called "liquid leakers"). This results in in a disproportionate fraction of the overall evaporative emissions coming from those few vehicles. RV2013 assumes there are no "liquid leakers" in the OHRV fleet in California as there are currently no data on the "liquid leaker" fraction in the population. More importantly, all emissions tests were done on ATVs and OMCs that were in good operating condition such that there was no information available on the contribution of "liquid leakers" to the overall OHRV emissions inventory.

Table III-6. Evaporative Emission Factors for RV2013

Vehicle Type	MY Group	Hot Start (g/event)	Diurnal (g/day)	Resting (g/day)	Running Loss (g/mile)
OMC	2007 and before	3.12	12.23	6.59	1.07
	2008 and after	2.37	9.29	5.01	0.81
ATV	2007 and before	1.28	6.93	3.73	1.08
	2008 and after	0.97	5.26	2.83	0.82
Mini Bike	2007 and before	3.12	12.23	6.59	1.07
	2008 and after	2.37	9.29	5.01	0.81
Snowmobile	2007 and before	1.28	6.93	3.73	1.08
	2008 and after	0.97	5.26	2.83	0.82
Golf Cart & Specialty Vehicle	2005 and before	1.23	5.93	3.33	1.71*
	2006 and after	1.23	1.26	0.71	0.34*

* Running loss measured in g/hour

9. *Activity*

Assumptions about vehicle activity or usage (e.g. miles driven per year, hours used per year) are a critical component in estimating the OHRV emissions inventory. Previously, in OFFROAD2007, the activity of OHRVs was assumed to remain constant throughout the entire engine life span. To support the development of

RV2013, ARB contracted with CSUS to conduct a phone survey in 2009 of California OHRV owners who were randomly selected from DMV registration data. A total of 1,123 complete responses were received. While the focus of this survey was on OMC and ATV owners, a small sample (less than 2 %) of respondents reported they were owners of mini bikes, golf carts, and specialty vehicles. As the survey was conducted during the depth of the last recession (2009), it is not clear to what extent the reported usage was biased low because of owners using their vehicles less than in normal economic times.

To supplement the activity data, staff also conducted Internet research. By analyzing sales information for secondhand OHRVs, specifically the reported mileage or hours of use reported for different model year used OHRV, staff was able to estimate the annual activity for snowmobiles, golf cart, and specialty vehicles. Appendix C provides a detailed analysis showing how the activity was estimated for each vehicle type.

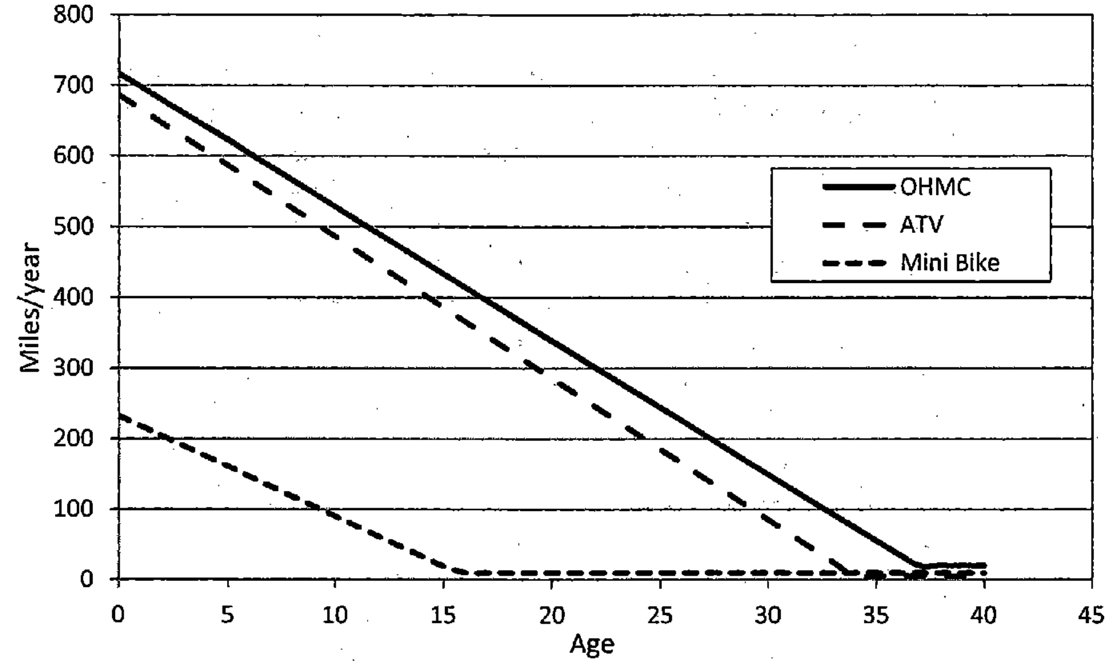
The results of the CSUS survey show that the activity of OHRVs declines with respect to age. Table III-7 summarizes the range of activity for different type of OHRVs. All vehicles show a higher activity during initial years when the vehicles are used more heavily. Based on the CSUS survey, the annual average usage for OMCs, ATVs, and mini bikes is 350 miles/year, 303 miles/year, and 56 miles/year, respectively. In addition, the annual average usage for snowmobiles and golf carts and specialty vehicles is 26 hours/year and 61 hours/year, respectively.

Table III-7. Annual Activity for OHRVs

Vehicle Type	Activity Range	Average
OMCs (miles/year)	717 to 20	350
ATVs (miles/year)	687 to 5	303
Mini Bikes (miles/year)	233 to 10	56
Snowmobiles (hours/year)	120 to 11	26
Golf Carts & Specialty Vehicles (hours/year)	540 to 10	61

Figure III-7 shows how the annual activity of OMCs, ATVs, and mini bikes changes with vehicle age. Not surprisingly, newer, more reliable vehicles are used the most, with usage declining as vehicles age. A similar trend is seen for on-road vehicles where newer vehicles are typically used more than older vehicles. For OMCs, the CSUS survey reported annual activity ranging from 717 miles/year for new motorcycles to 20 miles/year for 38 year old motorcycles. For ATVs, the survey reported annual activity ranging from 687 mile/year for new ATVs to 5 miles/year for 35 year old ATVs. Mini bikes, which are used sparingly, have reported usage ranging from 233 miles/year when new to about 10 miles/year at age 17. Since the CSUS survey did not provide results for the very oldest OHRV (40 or 50 years old), it was assumed that these very old vehicles had the same usage level as the oldest vehicle reported in the survey.

Figure III-7. Activity by Age for OMCs, ATVs, and Mini Bikes



10. Correction Factors

Evaporative emissions testing is conducted under controlled temperature and humidity conditions. However, OHRVs may experience different temperature and humidity conditions depending on where the vehicle is actually operated and stored. For the purpose of emissions inventory modeling, corrections are developed and applied to the baseline emission factors, which reflect controlled laboratory conditions, to better account for the emissions produced under real-world operating conditions.

For political and regulatory purposes, California is divided into 58 counties, 35 local air districts, and 15 air basins. The boundary of each air basin or air district does not necessarily coincide with the boundary of multiple counties. To estimate emissions for each unique combination of air basin, local air district, and county, emissions are developed for a smaller unit of area called a geographic area of interest (GAI). A total of 69 GAIs were developed and formed the basis for spatially allocating the statewide OHRV emissions inventory. The OHRV emissions inventory for a specific county, air district, and air basin combination (or GAI) was corrected to account for the unique ambient temperature and humidity characteristics, as well as fuel requirements of that GAI.

The following section will discuss the correction factors applied in RV2013 to reflect the local temperature and humidity conditions that OHRVs experience during operation and storage in different regions of California.

a. Temperature/RVP Correction for Evaporative Emissions

(1) Temperature/RVP Correction (Diurnal and Resting Loss)

Temperature/RVP correction factors are primarily used to correct the diurnal and resting loss emissions measurements made under laboratory conditions of 65°F to 105°F and standard RVP of 7 pounds per square inch (psi) to local ambient temperature and dispensed fuel properties that OHRVs actually experience under real-world conditions. Previously, ARB applied the Temperature/RVP correction based on a laboratory study in which evaporative emissions from lawn mowers were measured with a combination of different temperature profiles and fuel RVP blends. After reviewing ARB's previous methodology, the Eastern Research Group recommended a new approach using vapor generation and permeation as the basis for the Temperature/RVP correction (ERG, 2013).

The work to model the amount of vapor generated from the evaporation of gasoline was first undertaken by Wade in the 1960s, who established equations relating vapor generation to fuel temperature rise and several fuel properties, including RVP, distillation properties, density and molecular weight (Wade, 1967). These equations have been used by the United States Environmental Protection Agency (U.S. EPA) for earlier versions of their on-road emissions model (MOBILE), as well as their off-road emissions model (NONROAD). In the 1980s, Reddy developed a simplified model for vapor generation based only on fuel temperature rise and RVP, and published model coefficients reflecting variations in altitude (sea level, Denver) and ethanol level (E0, E10) (Reddy, 1989).

The Temperature/RVP correction was estimated based on two main processes which are described in more detail below: vapor generation (uncontrolled system) and permeation.

Vapor Generation

For this analysis, we used the Reddy equation for estimating grams of gasoline vapor generated per gallon of fuel tank vapor space, using coefficients for sea level and E10, as these are most reflective of California conditions:

Vapor generated (g/gal vapor space) = $A^* e^{B^*(RVP)} (e^{C^*T2} - e^{C^*T1})$
Where,
RVP, starting temperature (T1) and ending temperature (T2) are inputs, and A, B and C are coefficients for E10 and sea level (A=0.00875, B = 0.2056, C=0.0430).

Vapor generated (grams) = Vapor (g/gallon vapor space) * Fuel Capacity (gal) * (1- Fill %)

Permeation

The permeation process is assumed to include both tank permeation and hose permeation. The base permeation emission factors are 10.7 g/m^2 /day for tanks, and 222 g/m^2 /day for hoses based on the U.S. EPA NONROAD model (E10 fuel). Generally speaking, temperature corrections for permeation in NONROAD are based on the rule of thumb that permeation emissions double with every increase of 18°F (10°C) from its reference temperature. As a result, a temperature adjustment is applied to the reference temperature when estimating the permeation emission factor at a different temperature.

Hose Permeation Temperature Adjustment

Temperature adjustment is applied to the hose permeation calculation. The hose permeation doubles with each 18°F increase from the reference temperature of 73°F.

TCF = 0.06013899*exp(0.03850818*T)

Tank Permeation Temperature Adjustment

Temperature adjustment is applied to the tank permeation calculation. The tank permeation doubles with each 18°F increase from the temperature of 85°F.

TCF = 0.03788519*exp(0.03850818*T)

Diurnal = Vapor Generation + 0.5*(Tank Permeation + Hose Permeation)
Resting Loss = 0.5*(Tank Permeation + Hose Permeation)

By calculating the absolute values of diurnal and resting loss at 65°F to 105°F and other local temperature conditions and fuel RVP, staff is able to normalize all calculated values, based on the value from 65°F to 105°F as 100%. These normalized values are used as the Temperature/RVP correction to adjust diurnal and resting loss emission factors to the local temperature and fuel RVP conditions. The tank size or hose diameter that is assumed represents the typical fleet average and is not important in the final calculation as staff is only interested in the normalized values from different temperature and RVP conditions. Appendix D provides a sample calculation of how the Temperature/RVP correction can be applied to diurnal and resting loss emissions conducted at different temperature profiles and fuel RVP.

(2) RVP Correction (Hot Soak and Running Loss)

The RVP correction is applied to the hot soak and running loss of the evaporative emissions that are conducted with fuel RVP of 7 psi. When the winter fuel with RVP of 9 psi is used, the following formula is used:

$$CF_{RVP} = 0.3*RVP-1.1$$

Applying RVP = 9 psi, the above equation becomes 0.3*9-1.1 = 1.6 which is used for all GAI when winter fuel is used. For summer fuel (RVP is at 7 psi), there is no correction for RVP, which indicates that CF_{RVP} is 1.

b. Fuel Correction Factor for Exhaust Emissions

The fuel correction factors (FCFs) are dimensionless multipliers applied to the basic exhaust emissions rates that account for differences in the properties of certification fuels compared to those of commercially dispensed fuels. California went through three phases of reformulated gasoline in the past two decades: California Reformulated Phase 1 Fuel (1992 to 1995), California Reformulated Phase 2 Fuel (1996 to 2003), and California Reformulated Phase 3 Fuel (2004+) including 6% ethanol gasoline (E6) and 10% ethanol gasoline (E10). In those instances where engines or vehicles are not required to certify, the FCFs intends to reflect the impact of changes in dispensed fuel over time as refiners respond to changes in fuel specific regulations compared to the fuel used to obtain the test data.

E10 is the reference fuel assumed in RV2013 for estimating the future emissions inventory because most OHRV are tested on E10 and it is the current commercially available gasoline. As a result, staff renormalized previous FCFs in OFFROAD2007 to E10 fuel (Sicat, 2007).

c. Temperature and Humidity Correction

The temperature and humidity correction for exhaust emissions were developed as follows:

(1) Temperature Correction

For hydrocarbons and NO_x, the temperature correction is

$$CF_{Temp} = 10^{(T-75)a}$$

Where,

T = ambient temperature (°F)

a = coefficient which depends on engine type and whether the ambient temperature is above or below 75°F as shown in Table III-8

Table III-8. Coefficients for Temperature Correction

Pollutants	Low Temp (<75F)		High Temp(>75F)	
	G2	G4	G2	G4
CO	0	0	0.01494	-0.0146
HC	0	0	0.00484	-0.0113
NOx	0	0	0	-0.0059

To simplify the calculation methods used in developing the OHRV emissions inventory, we have applied the temperature correction on a daily basis to the average daily temperature. Using this approach captures the general trend of the correction factor without requiring calculations on an hourly basis.

(2) Humidity Correction

For humidity correction for NOx, the correction factor is

$$CF_{Humd} = 1 - 0.0038 \times (A - 75)$$

Where *A* is the absolute humidity.

The absolute humidity is derived from the relative humidity and ambient temperature based on the following equation:

$$ABH = RH \times (-0.09132 + 0.01594 \times T - 0.00029 \times T^2 + 0.00000437 \times T^3)$$

Where,

ABH = scenario humidity (grains/pound)
T = scenario temperature (F)
RH = relative humidity (%)

However, this equation is bounded to use ambient temperatures between 40°F and 120°F, and to predict absolute humidity values not greater than 200 grains/pound.

If the ambient temperature is less than 40°F, then 40°F is used for the calculation. Similarly, if the ambient temperature is higher than 120°F, then 120°F is used for calculation. Finally, if the calculated absolute humidity is greater than 200 grains/pound, then only 200 grains/pound is used.

d. <u>Correction Factor for ROG, TOG, and CH_4</u>

(1) ROG and TOG Correction

This correction factor refers to the conversion of THC to TOG, ROG, and other pollutants. The conversion factor varies by calendar year (due to phase-in schedule of reformulated gasoline), engine type and emission process such as evaporative and exhaust. The conversion coefficients are listed in Table III-9.

Table III-9. Conversion Factors for THC, TOG and ROG

Calendar Year	Engine	Process	TOG	ROG
Pre-1996	Gasoline Engine	Exhaust (G2)	THC*1.01	THC*0.92
		Exhaust (G4)	THC*1.04	THC*0.89
		Evaporative (All)	THC*1.04	THC*1.04
1996 - 2003	Gasoline Engine	Exhaust (All)	THC*1.09	THC*1.00
		Evaporative (All)	THC*1.12	THC*1.12
2004+	Gasoline Engine	Exhaust (All)	THC*1.10	THC*1.01
		Evaporative (All)	THC*1.14	THC*1.14

(2) Methane (CH_4)

CH_4 is derived as a fraction of TOG. The formula is: CH_4=TOG*Coefs. The coefficients are shown in Table III-10.

Table III-10. Coefficients Used for CH4 Conversion from TOG

Fuel Type	CY	Coefficients
G2	Pre-1996	0.0774
	1996 - 2003	0.0558
	2004+	0.0572
G4	Pre-1996	0.1132
	1996 - 2003	0.0558
	2004+	0.0572

e. <u>Fuel Consumption and SO_2 Calculation</u>

(1) Fuel Consumption

The fuel consumption correction factor is derived from mass balance using CO, CO_2 and with TOG or ROG. The formulas are shown below and the fuel consumption coefficients are shown in Table III-11:

For hydrocarbon reported in ROG, fuel consumption =

[12.011/(12.011+Alpha*1.008))*TOG/ROGadj+0.429*CO+0.273*CO2]/(0.854*453.59237*Fuel Density)

For hydrocarbon reported in TOG, fuel consumption =

[(12.011/(12.011+alpha*1.008))*TOG+0.429*CO+0.273*CO2]/(0.854*453.59237*Fuel Density)

Table III-11. Coefficients Used for Fuel Consumption Calculation

Fuel Type	CY	Alpha	TOGAdj	ROGAdj	Fuel Density (lb/gallon)
G2	Pre-1996	0.54	1.0155	0.9079	6.17
	1996-2003	0.54	1.0949	0.9219	
	2004+	0.54	1.1004	0.9198	
G4	Pre-1996	0.54	1.0379	0.8648	
	1996-2003	0.54	1.0949	0.9219	
	2004+	0.54	1.1004	0.9198	

(2) Sulfur Dioxide (SO_2)

The SO_2 correction factor is calculated based on sulfur content in the fuel and will differ by fuel type.

The formula is:

SO_2 (g/hp-hr)=(ppm /10^6) * 2 *BSFC * 453.5

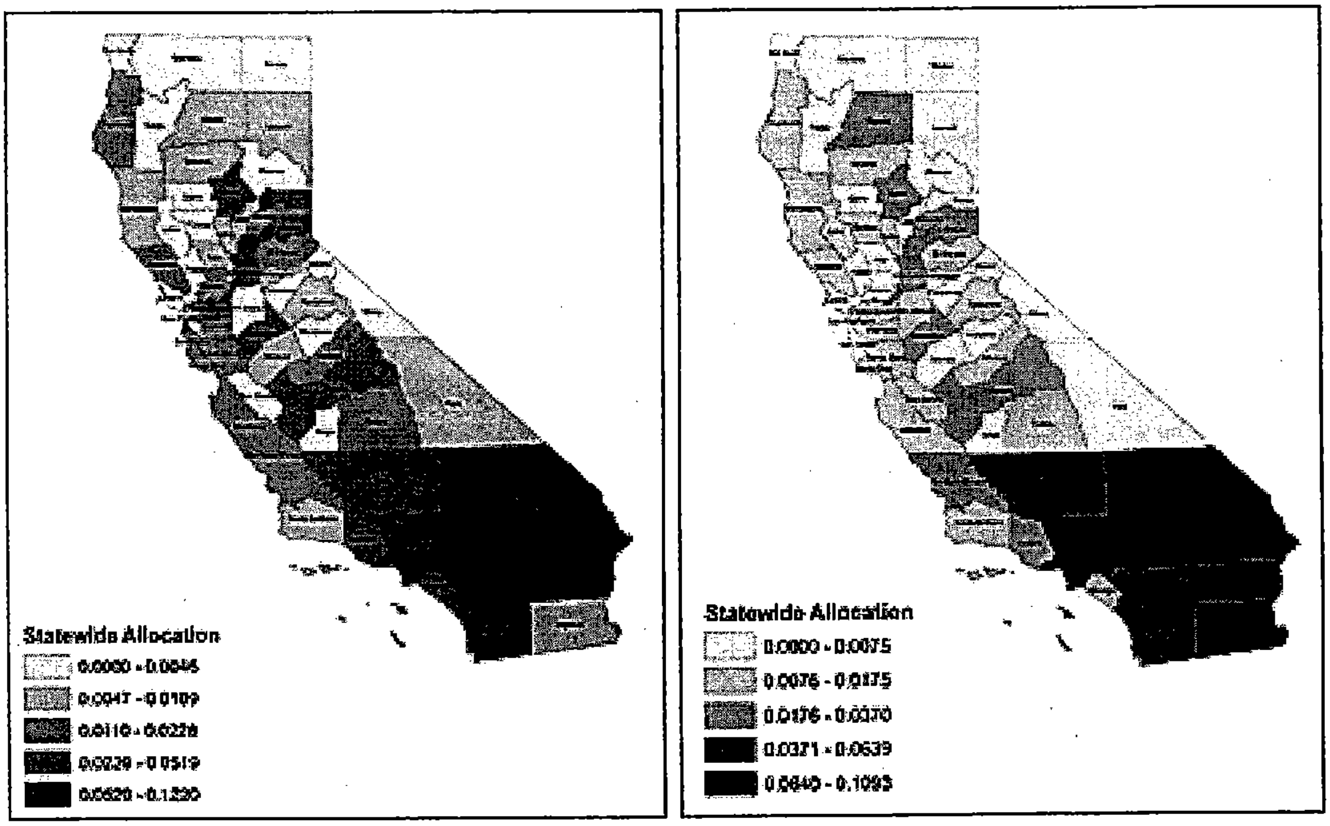
Where,
ppm is S content in the fuel (weight basis)
BSFC is the brake-specific fuel consumption (lb/hp-hr)
Conversion factor from pound to gram is 453.5

11. Spatial Allocation

Allocating emissions spatially is an important part of an emissions inventory. In the case of OHRVs, the spatial allocation of emissions associated with vehicle operation and storage are different because of differing emission processes and environmental conditions (e.g. temperature and humidity) for different locations. Using OMCs as an example, as shown in Figure III-8, during operation only the exhaust and hot soak and running loss of the evaporative emissions are allocated to the area of operation such as state parks. On the other hand, when OMCs are being stored in a garage, only the diurnal and resting portion of the evaporative emissions are allocated to that location. Figure III-8 shows how the spatial allocation of storage and operating emissions differs for OHRVs in California. Table III-12 summarizes the surrogates used in the RV2013 model for allocating evaporative emissions associated with OHRV operation and storage related emissions. DMV registration data was primarily used to estimate the allocation factor for storage allocation for all five types of vehicles. CSUS survey data were used to estimate the operation allocation factor for OMCs and ATVs. For mini bikes, golf carts, and specialty vehicles, staff assumed the area of operation is close to where vehicles are registered. For snowmobiles, the areas above 5000 feet during winter are used as a surrogate for the operation allocation factor.

Figure III-8. Spatial Allocation for OMCs*

Area of Storage   Area of Operation



* Note this chart shows the percentage of vehicles stored in each county on the left, and the percent of total vehicle operation on the right. Exhaust and running loss emissions are allocated to areas of operation, while diurnal and resting evaporative emissions are allocated to storage areas.

Table III-12. Summary of Spatial Allocation for Recreation Vehicles

Vehicle Type	Operation	Storage
OMCs	CSUS survey	DMV Registration
ATVs	CSUS survey	DMV Registration
Mini Bikes	DMV Registration	DMV Registration
Snowmobiles	Area above 5000 ft (winter)	DMV Registration
Golf Carts & Specialty Vehicles	DMV Registration	DMV Registration

a. Operation

For OMCs and ATVs, staff developed the spatial allocation for vehicle operation based on the CSUS survey data which provides information on those counties where survey respondents used their OMCs or ATVs.

The allocation factor was derived using the CSUS survey data as shown in the following formula by taking into account the actual activities reported on the survey:

$$AF_{OP,i} = \frac{\sum_j D_j \times H_j \times PT_{i,j}}{\sum_i \sum_j D_j \times H_j \times PT_{i,j}}$$

Where,
$AF_{OP,I}$ = the operation allocation factor for county i
D_j = the number of days of vehicle riding for respondent *j* per year
H_j = the hours of riding per day for respondent *j*
$PT_{i,j}$ = the percentage of time for respondent *j* spent riding in county *i*

As mini bikes are small in size and have a limited range of operation, staff assumed they are operated near the addresses where the end users are registered. For snowmobiles, staff assumed that the operation will take place at areas above 5000 feet during the winter season. Finally, since most golf carts and specialty vehicles are used in places such as golf courses, parking lots, or school campuses, staff assumed these vehicles would also be operated near the addresses where they are registered.

b. Storage

As the DMV registration data includes the county code, staff was able to assign individual OHRV to their county of registration. The statewide total OHRV storage emissions were then allocated to the local county level based on the percent ownership of vehicles for each county.

12. Benefit of Red and Green Sticker Program

The Red and Green Sticker Program was adopted by ARB with the intent of protecting air quality in ozone non-attainment areas by limiting the use of OHRVs such as OMCs and ATVs that do not meet emission standards applicable for California OHRV riding areas. After the regulations were established, ARB and DMV worked together to develop criteria for identifying non-complying OHRVs.

Generally speaking, OHRVs with green stickers are allowed to operate on public land all year around. Vehicles with the red sticker, which is for 2003 and later model year OHRV that do not meet the emission standards established by ARB, are not allowed to operate during certain times of the year when ozone attainment is more challenging (such as summer months).

Since the implementation of the Red and Green Sticker Program, more consumers are buying the OMC and ATV with green stickers. Consequently, there is a huge incentive for OHRV manufacturers to produce more engines that meet the green sticker requirement. Though OHRV have 4 stroke engines, as observed in the recent DMV data, there are still some ATVs and OMCs with 2 stroke engines. Appendix E provides a more detailed description regarding the estimate of emission benefit from the Red and Green Sticker Program.

13. *Seasonality*

To model seasonal variability in OHRV usage in California, staff analyzed the activity survey data collected by CSUS in 2009. Questionable survey responses were filtered out and not used for subsequent analysis based on the following criteria:

- Daily usage of OMC greater than 10 hours.
- More than 365 days of usage reported in a year.

For each valid response, the total hours of use per year was calculated by multiplying the reported days of use per year by the reported hours of use per day.

The monthly usage was developed for each of the four seasons: winter (December to February), spring (March to May), summer (June to August), and fall (September to November). The monthly usage was calculated using the following equation:

$$MUF_i = \frac{THU \times UF_i}{3}$$

MUF_i is the monthly usage frequency for season i,THU is the total hours of usage per year, and UF_i is the usage frequency for season i.

Since the seasonal definition in the RV2013 model is different from what was defined in the survey, the seasonal usage frequency is calculated by summing the monthly usage frequency over the specified season. In the model, the summer season refers to the six months from May to October while the winter season refers to the remaining six months from November to April.

$$SUF_i = \sum_j MUF_{j,i}$$

SUF_i is the seasonal usage frequency for a given season *i*, $MUF_{j,i}$ is the *j* month usage frequency within a given season *i*. The RV2013 model assumes summer months to include May through October and winter months to include November through April.

Therefore, the seasonality adjustment will be:

$$SA_i = \frac{SUF_i}{\sum SUF_i}$$

Where,
SA_i is the seasonal adjustment factor for season i.

Using the methodology described above, the seasonality adjustment factor for OHRV is 0.97 for summer months and 1.03 for winter months.

14. *Garage Temperature Correction*

Since temperature has such a significant effect on evaporative emissions from OHRVs, especially the diurnal and resting loss processes, it is critical that the emissions modeling reflects the temperatures actually experienced by OHRVs under real-world storage conditions. With this in mind, staff corrected the ambient temperature profiles assumed in the modeling to better reflect the temperatures OHRVs experience when stored inside a garage in California.

Specifically, vehicles stored inside the garage would experience less fluctuation of temperature when compared to the ambient temperature. When the ambient temperature is corrected with a garage temperature correction, the overall net effect is about a 5 % reduction in baseline evaporative emissions. Appendix F provides a more detailed description of the methodology developed for garage temperature correction using data provided by Sierra Research and also independently collected by ARB.

15. *Long Term Weathering Correction for Inactive Vehicles*

Evaporative emissions (diurnal and resting loss) are based on the assumption the emission rate remains constant throughout all 365 days of the year for inactive vehicles. This assumes the liquid-phase composition of the tank fuel is constant (no depletion of volatile components over time). While such assumptions may be reasonable for active vehicles, as they are refueled more frequently throughout the year, it may not be applicable for inactive vehicles, as they are more likely to sit many months without activity or refueling. Staff developed an "adjustment factor" to reduce the evaporative emissions from those inactive vehicles due to weathering of the fuel as described in Appendix G.

16. Methods and Data Used for Estimating the Rule Inventory

In developing the proposed evaporative emission standards for OHRV, ARB staff worked closely with the OHRV manufacturers and their representatives to ensure the proposed standards are technically feasible. Specifically, ARB conducted in-house evaporative testing on ATVs and OMCs equipped with the proposed control technologies to ascertain whether the proposed evaporative emissions standards can be met. To model the emissions benefits of the proposed rule, staff assumed that the appropriate model years of new OMCs, ATVs, mini bikes, and specialty vehicles meet the proposed evaporative standards. Note that snowmobiles and golf carts are excluded from the proposed rule, as snowmobiles are currently only subject to federal regulation and gasoline-fueled golf carts are regulated under ARB's existing small off-road engine regulation (SORE). The proposed evaporative emission diurnal standard is shown in Table III-13.

Table III-13. Proposed Evaporative Controls for OHRV

Model Year	Required Test	Test Standard
2018 and later model years	Diurnal	1 g TOG/day

The phase-in schedule for the proposed standards lasts for four calendar years from 2018 to 2021 with average phase-in of 75% per compliant vehicles manufactured in each calendar year during the phase in. For all estimates made during the phase in period, it is assumed that a manufacturer would phase in emission standards at a rate of 50% in model year 2018, 75% for both 2019 and 2020, and 100% for 2021. Small volume manufacturers have the option of certifying OHRVs to a design-based standard. However, in estimating the rule inventory, staff assumed all new OHRV will meet the proposed diurnal emission standard of 1.0 g TOG/ day.

All emission factors are based on total hydrocarbon (THC), therefore all emission standards reported as total organic gas (TOG) must be converted to THC for use in the inventory model. The proposed 1 g TOG/day diurnal emissions standard is converted to THC by dividing by 1.1248, resulting in a THC equivalent standard of 0.89 g/day.

The proposed rule does not set a measured standard for hot soak or running loss emissions. Instead, hot soak and running loss are included as vehicle preconditioning tests, and are expected to be controlled by the stringent diurnal standard. To determine the hot soak and running loss emission factors, staff used the average test results for a prototype controlled OHRV, reported as THC, from controlled ATV and OMC.

Since hot soak is defined as a 45-minute event, the 1.5 hour hot soak test result is adjusted to 45 minutes by multiplying by a factor of 0.65 (see Appendix B). The average hot soak from controlled ATVs and OMCs is 0.33 g per 1.5 hour event. After the adjustment, the hot soak emission factor is 0.21 g per 45 minute event associated with the proposed controls for OHRV.

The average running loss for controlled ATVs and OMCs is 0.13 g per 7.45 miles. Thus, the running loss emission factor is 0.018 g/mile associated with the proposed controls for OHRV. The evaporative emission factors based on the proposed standard and controlled emission tests are shown in Table III-14.

Table III-14. Emission Factors Based on the Proposed Rule

Evaporative Process	New Standard	Proposed Emission Factor (THC)	Unit
Diurnal and Resting Loss	1.0 g TOG	0.89	g/day
Hot Soak	NA	0.21	g/event
Running Loss	NA	0.018	g/mi

Note that THC=TOG/1.1248

IV. RV2013 MODEL

The RV2013 emissions inventory model uses the Microsoft Access™ platform to perform all calculations. Input information such as population, activity, emission factors, correction factors, and spatial allocation are stored as tables. During the calculation process, queries are used to combine variables from different tables and carry out the calculation process.

A. CALCULATION PROCESS

The population input table includes five categories; namely, OMCs, ATVs, mini bikes, snowmobiles, and golf carts and specialty vehicles. Each category includes active or inactive status, calendar year, model year, horsepower group, and technology. The technology group is subcategorized into 2-stroke-gasoline-carbureted (G2-CARB), 2-stroke-gasoline-fuel injected (G2-FI), 4-stroke-gasoline-carbureted (G4-CARB) and 4-stroke-gasoline-fuel injected (G4-FI). The activity input table provides the annual activity with respect to age while the emission factor input tables include exhaust and evaporative emission factors grouped by calendar year group or technology.

The top-down calculation process starts with multiplying the population input tables with activity table and emission factor tables, resulting in the statewide uncorrected emissions. The statewide uncorrected emissions are then allocated to the local GAI and adjusted with different correction factors to reflect the local conditions (e.g., Temperature/RVP, garage temperature effect, ambient temperature and humidity correction, etc.)

The model output provides emissions with and without the proposed rule at the statewide, air district, and air basin levels, as well as by season and calendar year. End users may also specify the vehicle type, vehicle status (active or inactive), technology, and horsepower prior to getting the emissions summary. Finally, the model is capable to provide outputs by model year for a given calendar year.

B. MODEL INSTALLATION AND USER GUIDE

The RV2013 model can be downloaded from ARB website as follows:
http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles

The RV2013 model runs as an Access database file. The model was developed in Microsoft Access 2010 and previous versions of Access may not support all the model functionality. The computer needs to have sufficient memory to store and run the model (these requirements are fairly small). Unzipped, the file will be about 1.2 GB. When running the model, the file size can grow to up to 2.0 GB. Model runtime varies depending on the processing power of the computer. Estimates are provided in the user interface. Details on the model installation and user guide can be found in Appendix I. Finally, the source code of RV2013 is provided in Appendix J.

V. EMISSION RESULTS

A. BENEFITS OF PROPOSED RULE

The emission benefits from the proposed rule are summarized in Table V-I, which provides ROG emission reductions through evaporative controls. The proposed rule phases in between 2018 and 2021, requiring increasing control levels for vehicles manufactured in these calendar years. A small statewide benefit of 1.34 TPD is observed starting in 2020. In 2023, the benefit increases to 3.35 TPD, as more vehicles will be subject to the proposed rule. By 2035, about 70% of the OHRV population will be subject to the proposed evaporative controls, the statewide summer ROG benefit increases to 9.91 TPD.

For the Bay Area Air Quality Management District (AQMD), the ROG benefits are 0.16 TPD, 0.40 TPD, and 1.20 TPD for 2020, 2023, and 2035, respectively. For the San Joaquin Valley (SJV) Unified Air Pollution Control District (APCD), the ROG benefits are 0.22, 0.55, and 1.61 TPD ROG for 2020, 2023, and 2035, respectively. For the South Coast AQMD, ROG benefits are 0.38, 0.97, and 2.99 TPD for 2020, 2023, and 2035, respectively.

Table V-1. Benefits of the Proposed Rule for Summer Emissions (tons/day)

2020	Baseline		Proposed Rule		Benefit	
	ROG	NOx	ROG	NOx	ROG	NOx
Statewide	17.35	0.83	16.01	0.83	1.34	0.00
Bay Area AQMD	2.04	0.10	1.88	0.10	0.16	0.00
SJV Unified APCD	2.88	0.15	2.66	0.15	0.22	0.00
South Coast AQMD	4.33	0.08	3.95	0.08	0.38	0.00

2023	Baseline		Proposed Rule		Benefit	
	ROG	NOx	ROG	NOx	ROG	NOx
Statewide	17.38	0.91	14.03	0.91	3.35	0.00
Bay Area AQMD	2.04	0.11	1.64	0.11	0.40	0.00
SJV Unified APCD	2.86	0.16	2.31	0.16	0.55	0.00
South Coast AQMD	4.46	0.09	3.49	0.09	0.97	0.00

2035	Baseline		Proposed Rule		Benefit	
	ROG	NOx	ROG	NOx	ROG	NOx
Statewide	19.08	1.13	9.17	1.13	9.91	0.00
Bay Area AQMD	2.25	0.14	1.05	0.14	1.20	0.00
SJV Unified APCD	3.08	0.20	1.47	0.20	1.61	0.00
South Coast AQMD	5.12	0.11	2.13	0.11	2.99	0.00

Appendix H provides a detailed breakdown of the evaporative emissions. For 2020 and 2023, the emission benefits are small as majority of the population is not covered by this rule. By 2035, about 70% of the population is subjected to the proposed rule, there are more emission benefits coming from the diurnal and resting process when comparing to running loss and hot soak.

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VII. APPENDICES

APPENDIX A. ESTIMATE OF SURVIVAL RATE

All engines will follow a natural attrition with a certain fraction of vehicles scrapped every year as they age. To model OHRV population growth, it is critical to have a good understanding how the engine population survives through time. As the 2000 to 2009 calendar year DMV OHRV registration data includes the model year of the vehicle registered, staff was able to analyze and develop a survival trend for a cohort of vehicles over that 10 year period.

To explain how the survival rate was estimated, staff used the DMV registered OMC as an example. Note that 2004 DMV data were not used due to limitations in that particular calendar year of data. Staff first calculated the survival ratio of a population for two consecutive calendar years at different ages. As shown in Table VI-1, the population of Age 10 in calendar year 2007 is 9674 while the population of Age 11 in calendar year 2008 is 9270. Therefore, the survival ratio of ($Pop_{Age\ 11,\ 2008}$ /$Pop_{Age\ 10,\ 2007}$) is 0.96 as listed in Table VI-2. In other words, only 96% of the population at age 10 of calendar year 2007 survived at age 11 of calendar year 2008.

Generally speaking, the survival ratio should decline starting the first year. However, unlike passenger cars, OHRVs are discretionary items, consumers are likely to purchase new OHRVs that are already a couple years old, which explained why the survival ratio actually increases in the beginning years.

After the survival ratios are calculated between calendar years 2000 and 2009, the average survival ratio was then calculated. As the average survival ratio starts to fluctuate after age 5, staff uses the moving average to minimize the fluctuation and come up with a smooth survival rate. As illustrated in Table VI-2, the refined survival ratio at age 6 (0.96) is the average of the survival ratio at age 5 (0.97) and age 6 (0.94).

Finally, the survival rate is calculated using the refined survival ratios. A reference population of 100 was used to multiply the refined survival ratios. Likewise, for other vehicle types such as ATVs, mini bikes, snowmobiles, and golf carts/specialty vehicles, staff used the similar approach in estimating their survival rates. Finally, Table VI-3 presents the survival rates of OHRVs used in RV2013.

Table VII-1. OMC Population from DMV

Age	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	22564	29531	45004	50817		39847	35245	23302	11888	4387
1	11345	24294	32942	41791		56045	53282	48261	32821	16572
2	9985	11932	24934	33809		66852	57948	54788	52225	35594
3	11698	10286	12391	25210		43089	67467	58151	54953	52568
4	8599	11850	10587	12716		34473	43469	67643	58239	55045
5	6939	8387	11591	10429		24639	33637	41934	63695	56406
6	6767	6511	8024	11204		12069	23119	31637	39580	58291
7	6518	6478	6307	7823		9727	11693	22224	30536	37746
8	6026	6222	6311	6140		10485	9315	11164	21093	28850
9	6524	5787	6113	6153		7250	10084	8927	10686	20240
10	8621	6216	5608	5944		5768	7030	9674	8477	10161
11	7575	8302	6049	5482		5780	5618	6717	9270	8064
12	5916	7152	8078	5898		5565	5546	5359	6403	8851
13	9581	5663	7026	7909		5115	5337	5325	5094	6124
14	12404	8957	5494	6797		5503	4897	5047	5053	4772
15	22461	11874	8770	5340		7302	5301	4689	4809	4802
16	19279	20486	11466	8481		6320	6938	5040	4388	4493
17	16439	18096	19848	11201		4927	6070	6632	4789	4166
18	12677	14518	16990	18893		7842	4653	5685	6272	4483
19	8015	11865	14210	16390		10306	7497	4427	5394	5912
20	5824	7001	11200	13279		17211	9731	7061	4116	4994
21	5300	5442	6904	10780		14693	16444	9286	6663	3855
22	4013	4815	5182	6396		11922	13574	15371	8720	6190
23	2850	3741	4696	4987		9589	11417	12779	14496	8282
24	2088	2540	3593	4445		5660	8817	10408	11617	13330
25	2217	1924	2490	3453		4417	5396	8350	9853	10890
26	2215	2066	1827	2366		4024	4088	4871	7572	8888
27	1358	2114	2042	1773		3082	3827	3871	4617	7010
28	1093	1308	2058	1941		2142	2865	3567	3505	4106
29	1021	1055	1280	1997		1596	2047	2675	3365	3229
30	1033	998	1031	1261		1746	1486	1894	2435	3048
31	437	1010	973	1010		1830	1667	1394	1785	2276
32	167	427	995	956		1157	1719	1568	1290	1625
33	10	172	439	976		930	1092	1626	1504	1191
34	9	7	168	428		878	878	1041	1526	1387
35	0	9	7	161		904	820	846	953	1429
36	0	0	9	7		409	857	782	772	887
37	0	0	0	11		165	404	829	711	723
38	0	0	0	0		5	157	383	786	683
39	0	0	0	0		11	6	155	364	736
40	0	0	0	0		0	9	6	151	349
41	0	0	0	0		0	0	14	9	139
42	0	0	0	0		0	0	0	10	5
43	0	0	0	0		0	0	0	0	9
Total	249568	269036	312637	354654		451275	491447	515403	522485	512788

*Note that the 2004 population was not used due DMV registration errors

Table VII-2. Survival Ratios Estimated from DMV Data

Age	2001	2002	2003	2006	2007	2008	2009	Average Survival Ratio	Refined Survival Ratio	Survival Rate
0	1	1	1	1	1	1	1	1	1	100
1	1.08	1.12	0.93	1.34	1.37	1.41	1.39	1.04	1.04	104
2	1.05	1.03	1.03	1.03	1.03	1.08	1.08	1.05	1.05	109
3	1.03	1.04	1.01	1.01	1.00	1.00	1.01	1.01	1.01	111
4	1.01	1.03	1.03	1.01	1.00	1.00	1.00	1.01	1.01	112
5	0.98	0.98	0.99	0.98	0.96	0.94	0.97	0.97	0.97	109
6	0.94	0.96	0.97	0.94	0.94	0.94	0.92	0.94	0.96	104
7	0.96	0.97	0.97	0.97	0.96	0.97	0.95	0.96	0.95	99
8	0.95	0.97	0.97	0.96	0.95	0.95	0.94	0.96	0.96	95
9	0.96	0.98	0.97	0.96	0.96	0.96	0.96	0.96	0.96	91
10	0.95	0.97	0.97	0.97	0.96	0.95	0.95	0.96	0.96	88
11	0.96	0.97	0.98	0.97	0.96	0.96	0.95	0.96	0.96	85
12	0.94	0.97	0.98	0.96	0.95	0.95	0.95	0.96	0.96	82
13	0.96	0.98	0.98	0.96	0.96	0.95	0.96	0.96	0.96	78
14	0.93	0.97	0.97	0.96	0.95	0.95	0.94	0.95	0.96	75
15	0.96	0.98	0.97	0.96	0.96	0.95	0.95	0.96	0.96	72
16	0.91	0.97	0.97	0.95	0.95	0.94	0.93	0.95	0.95	68
17	0.94	0.97	0.98	0.96	0.96	0.95	0.95	0.96	0.95	65
18	0.88	0.94	0.95	0.94	0.94	0.95	0.94	0.93	0.95	62
19	0.94	0.98	0.96	0.96	0.95	0.95	0.94	0.95	0.94	58
20	0.87	0.94	0.93	0.94	0.94	0.93	0.93	0.93	0.94	55
21	0.93	0.99	0.96	0.96	0.95	0.94	0.94	0.95	0.94	51
22	0.91	0.95	0.93	0.92	0.93	0.94	0.93	0.93	0.94	48
23	0.93	0.98	0.96	0.96	0.94	0.94	0.95	0.95	0.94	46
24	0.89	0.96	0.95	0.92	0.91	0.91	0.92	0.92	0.94	43
25	0.92	0.98	0.96	0.95	0.95	0.95	0.94	0.95	0.94	40
26	0.93	0.95	0.95	0.93	0.90	0.91	0.90	0.92	0.94	37
27	0.95	0.99	0.97	0.95	0.95	0.95	0.93	0.95	0.94	35
28	0.96	0.97	0.95	0.93	0.93	0.91	0.89	0.93	0.94	33
29	0.97	0.98	0.97	0.96	0.93	0.94	0.92	0.95	0.94	31
30	0.98	0.98	0.99	0.93	0.93	0.91	0.91	0.94	0.95	30
31	0.98	0.97	0.98	0.95	0.94	0.94	0.93	0.96	0.95	28
32	0.98	0.99	0.98	0.94	0.94	0.93	0.91	0.95	0.95	27
33	1.03	1.03	0.98	0.94	0.95	0.96	0.92	0.97	0.96	26
34	0.70	0.98	0.97	0.94	0.95	0.94	0.92	0.92	0.94	25
35	0.70	0.98	0.96	0.93	0.96	0.92	0.94	0.94	0.93	23
36	0.70	0.98	0.96	0.95	0.95	0.91	0.93	0.94	0.94	21
37	0.70	0.98	0.96	0.99	0.97	0.91	0.94	0.95	0.94	20
38	0.70	0.98	0.96	0.95	0.95	0.95	0.96	0.95	0.95	19
39	0.70	0.98	0.96	1.20	0.99	0.95	0.94	1.02	0.99	19
40	0.70	0.98	0.96	0.82	1	0.97	0.96	0.94	0.98	18

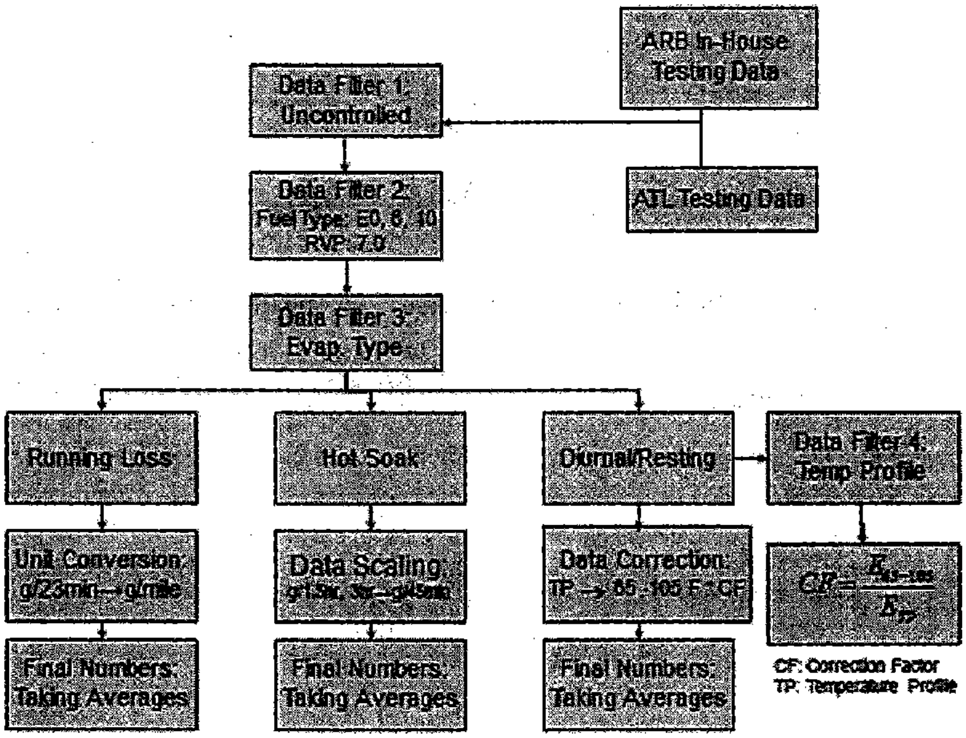
Table VII-3. Survival Rate (Percent) of OHRVs

Age	OMC	ATV	Snowmobile	Mini Bike	Golf Cart and Specialty Vehicle
0	100	100	100	100	100
1	104	105	135	125	220
2	109	107	147	121	206
3	111	108	153	116	196
4	112	107	157	112	183
5	109	103	158	107	167
6	104	99	156	103	152
7	99	95	153	98	137
8	95	91	150	94	125
9	91	88	146	88	116
10	88	84	143	82	107
11	85	81	139	75	99
12	82	78	134	69	92
13	78	75	131	63	84
14	75	72	128	61	79
15	72	69	124	59	74
16	68	66	120	57	69
17	65	63	116	55	64
18	62	61	112	53	59
19	58	59	107	51	55
20	55	56	102	49	51
21	51	54	96	47	46
22	48	52	89	45	44
23	46	49	84	43	42
24	43	46	78	41	39
25	40	43	71	39	36
26	37	41	65	37	33
27	35	38	60	35	30
28	33	35	55	33	28
29	31	32	50	32	27
30	30	30	45	29	25
31	28	28	40	26	23
32	27	27	36	23	21
33	26	25	31	20	20
34	25	24	28	17	18
35	23	22	24	15	18
36	21	21	21	12	17
37	20	19	19	9	16
38	19	18	17	6	14
39	19	16	15	3	13
40	18	15	0	0	13
41	0	0			12
42					11
43					9
44					8
45					8
46					7
47					6
48					6
49					3
50					0

APPENDIX B. EVAPORATIVE EMISSION FACTOR CALCULATION PROCESS

The following describes the process of deriving the baseline evaporative emission factors for OHRVs based on laboratory testing data. A diagram of this process is shown as in Figure VII-1. Calculation Process for Evaporative Emission Rates

Figure VII-1. Calculation Process for Evaporative Emission Rates



There are two sources of data for deriving emission factors for OHRVs; ARB in-house test data and Automotive Test Laboratory (ATL) test data. These two sources of data were combined together first. To develop uncontrolled emission factors, data were used from those tests without any controlled technology. The fuels used in the tests included gasoline with MTBE (E0), gasoline with 6% ethanol (E6), and gasoline with 10% ethanol (E10) with an RVP of 7.0 psi. The data were then further separated by testing procedures and purposes including diurnal and resting loss, running loss, and hot soak.

For running loss, the model reports the value in units of g/mile, while the testing data was reported as g/23 min. Thus, the g/23 min data had to be converted to g/mile data. The conversion is done using the total running loss during the entire test divided by the total travel distance. For ARB in-house data, since the UDDS driving cycle was used for the running loss testing, a total travel distance of 7.45 miles was used for the calculation.

Hot soak emissions are calculated over a 45 minute period. Hot soak emissions tests were conducted for 1.5 to 3 hours. Staff evaluated minute by minute emissions data for tests where those data were available to quantify emissions over the initial 45 minute period. Staff developed an average scaling factor to estimate 45 minute hot soak test results and applied this to tests where minute by minute data were not available. The average fraction of emissions by test is shown in Table VII-4 and Table VII-5.

Table VII-4. Percentage of Hot Soak Emissions by Duration (ARB)

Test #	45min	60min
1	0.63	0.76
2	0.64	0.77
3	0.64	0.84
4	0.67	0.8
5	0.65	0.78
Mean	0.65	0.79

Table VII-5. Percentage of Hot Soak Emissions by Duration (ATL)

Vehicle	45 min	60 min	90 min	180 min
ATV1	0.89	0.94	1	1.11
ATV2	0.82	0.83	1	1.13
ATV3	0.92	0.99	1	1.05
ATV4	0.6	0.75	1	1.65
ATV Average	0.81	0.88	1	1.24
OMC1	0.61	0.76	1	1.53
OMC2	0.77	0.85	1	1.41
OMC3	0.59	0.74	1	1.64
OMC4	0.63	0.77	1	1.48
OMC Average	0.65	0.78	1	1.52

Diurnal and resting loss tests were conducted on several temperature profiles including 65°-82°F, and 65°-105°F. In order to evaluate test data staff converted all data to be consistent with a 65°-105°F test schedule. To convert 65°-82°F test data, staff evaluated vehicle tests where both schedules were tested, and developed an emissions ratio for 65°-82°F relative to 65°-105°F. This ratio was then applied to 65°-82°F tests to estimate what emissions would have been like under a 65°-105°F test.

APPENDIX C. ACTIVITY ANALYSIS

Developing an updated estimate of vehicle activity was a critical portion of this emissions inventory update. In previous OHRV inventories, annual activity estimates (miles drive per year or hours operated per year) were assumed to remain constant over a vehicle's lifetime. In 2009, ARB contracted with the California State University in Sacramento (CSUS) to conduct a survey of OHRV usage and related information. Only registered vehicles were selected for sampling. The survey collected 1,126 respondents by telephone. The main information used in calculating the annual activity estimates were (1) the age of equipment at time of interview, (2) number of operating days used in the last year, (3) typical miles per day when used, and (4) typical hours per day when used.

As not all respondents answered or remembered specific information asked by each question, staff used two different approaches to estimate the annual activity.

- First Approach:

  Annual activity = number of operating day per year x miles per day

- Second Approach (if miles per day is not provided by respondent):

Annual activity = number of operating days per year x hours/day x assumed mph

We assumed the average speed for ATVs is 8 mph and the average speed for OMCs or mini bikes is 15 mph. From these two approaches, staff was able to estimate the annual activity for the OHRVs. Some of the vehicle owners indicated that they did not operate their vehicles though they were registered. Staff included these vehicles with zero activity in the analysis of annual activity.

It is important to note that as with all mobile sources, average activity per vehicle is variable and dependent on the owner and specific use. In general, activity estimates by age are developed by fitting a regression through what is a highly variable data set. This is also true with OHRVs.

ATV Activity

The survey activity data reported for ATVs is shown in Figure VII-1. Results show highly variable equipment usage that generally decreases with age. The decrease in activity with vehicle age is commonly observed in mobile sources. Generally new vehicles are used more than older vehicles due to novelty of the equipment, equipment deterioration, and other factors. Staff also reviewed the activity data versus age provided by MIC including the survey from nationwide warranty data for ATVs (n= 51,335) and nationwide telephone survey of ATV users (n =611). The warranty data for ATVs is for the first two and half years. Staff analyzed the warranty data and found them to be skewed toward the first year (about 47,160 first year warranty data out of 51,335 total samples). Figure VII-2 compares the estimated annual activity from CSUS survey and the averages from the MIC warranty data and averages from MIC telephone surveys. The results are consistent.

Figure VII-1. ATV Activity from CSUS Survey

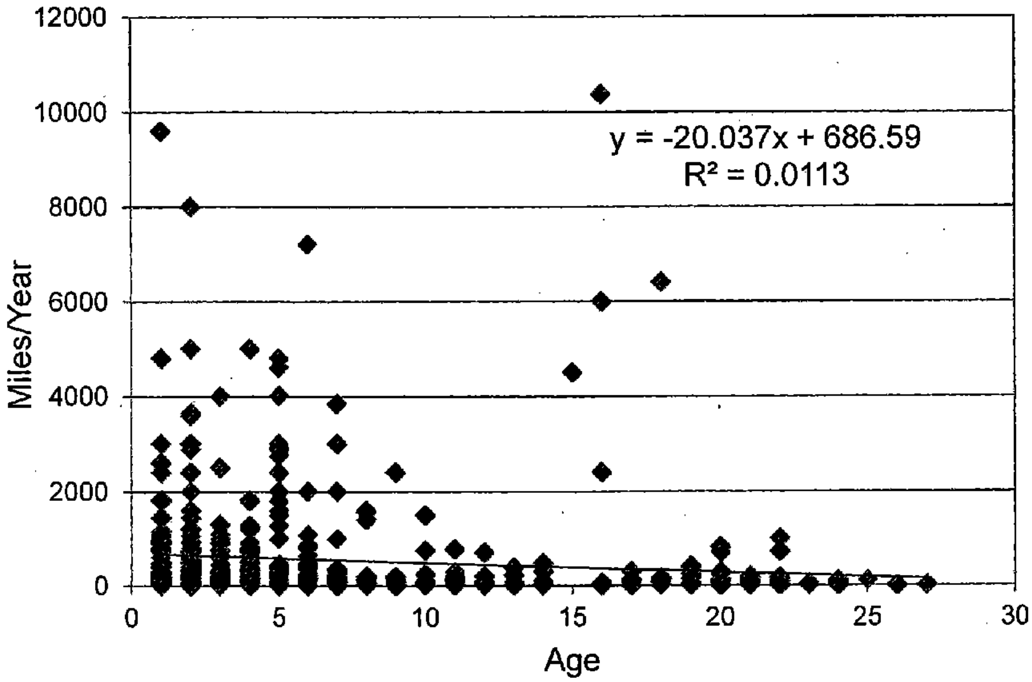
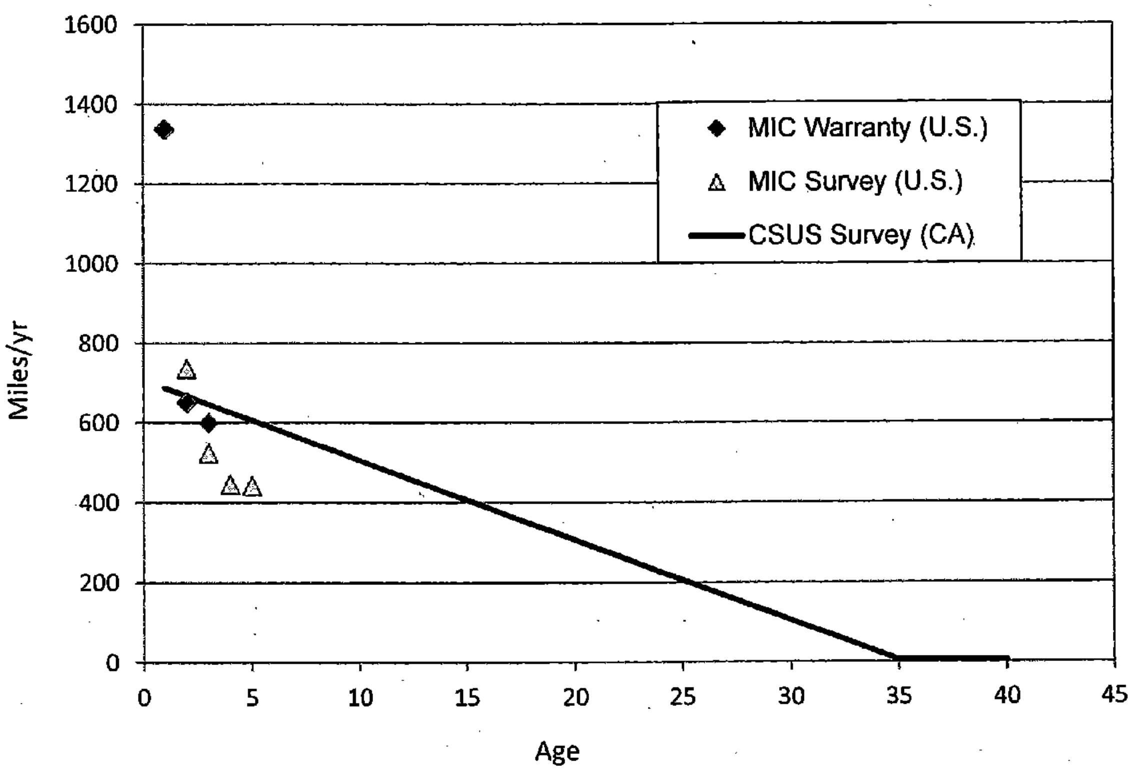


Figure VII-2. Comparison of ATV Activity from Survey and Warranty Data



OMC Activity

Similar to the estimate approach for ATVs, the activity by age was also estimated for OMCs. The scattered data points of age by activity (miles/year) were charted as shown in Figure VII-3 for OMCs.

Figure VII-3. OMC Activity from CSUS Survey

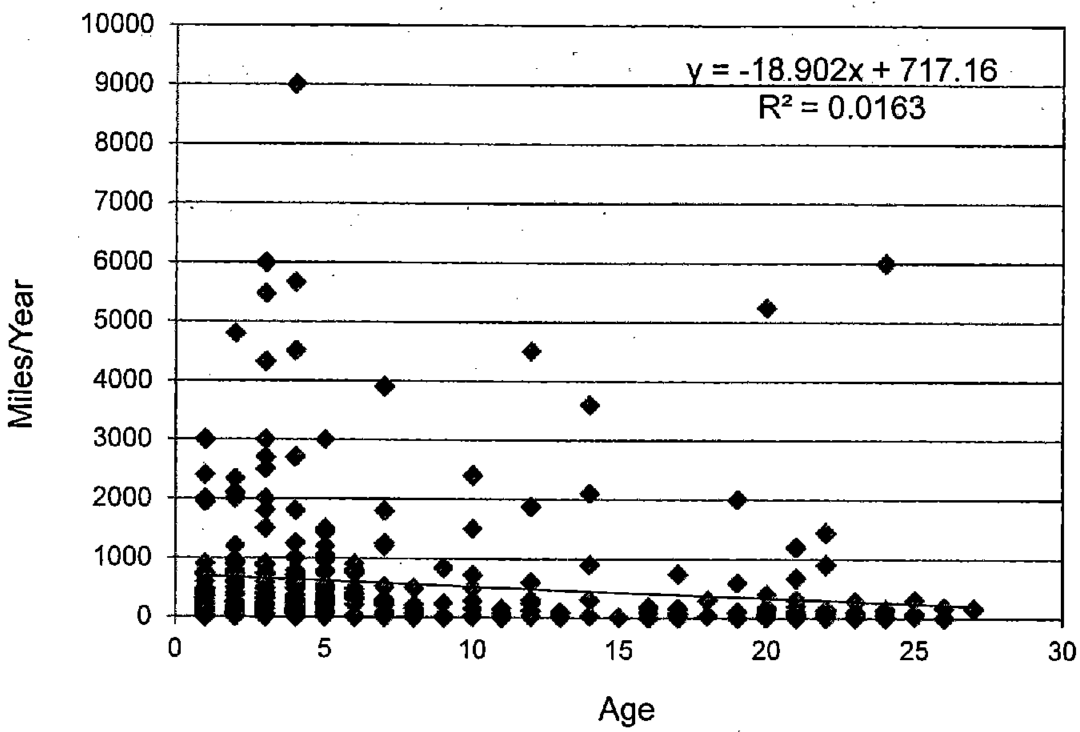
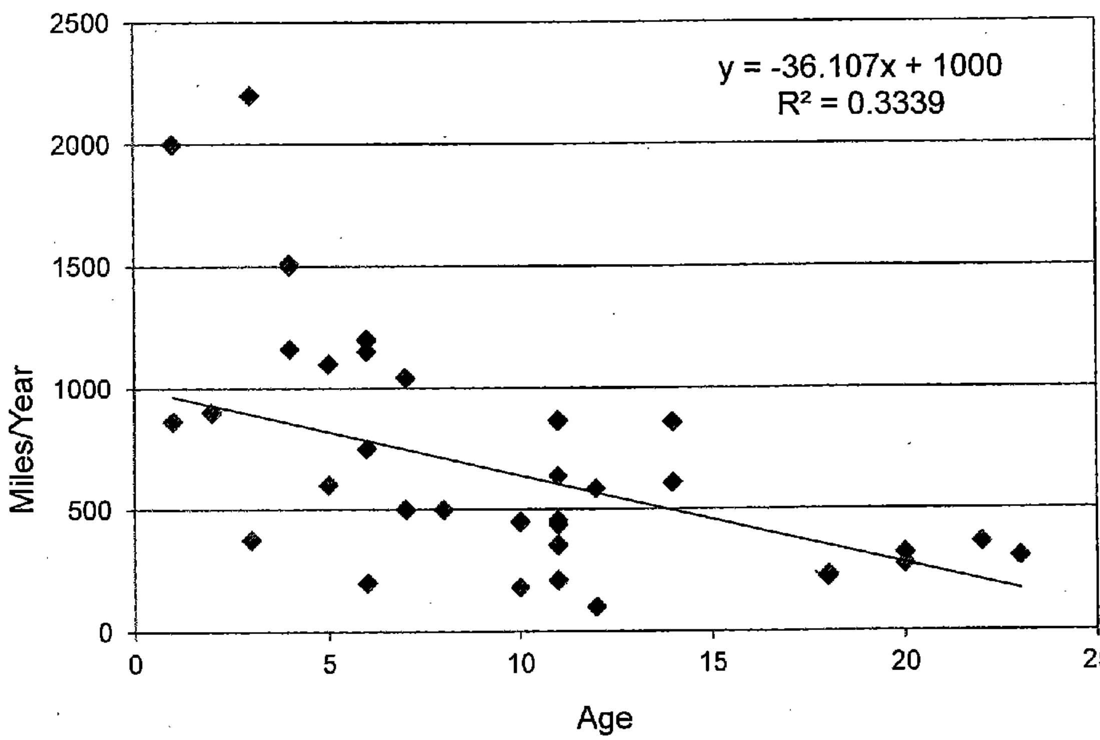


Figure VII-4 provided data on mileage and model year of the snowmobiles to be sold (snowmobileforum.com and snowmobilefanatics.com). Based on the information posed on these two websites, staff estimated the annual mileage. Staff assumed an average speed of 8 mph to convert the annual average in the final annual activity (hours/year).

Staff recognized that this activity estimate for snowmobiles may be high as the sales information is based on nationwide sales data and not only. Moreover, people participated in these two websites appear to be active user of snowmobiles. In the absence of activity data for snowmobiles, staff recommended using the web-based activity estimate until a more detailed survey can be done for California specific snowmobiles activity in future.

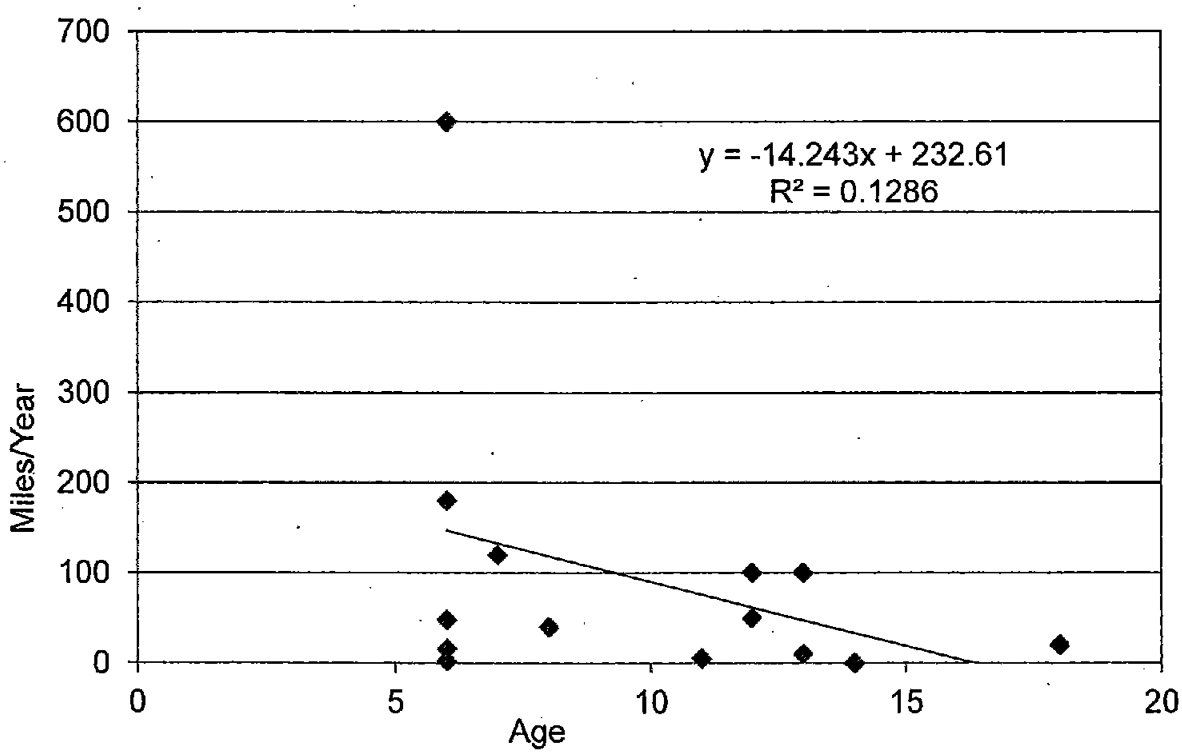
Figure VII-4. Snowmobile Activity from Internet Sales Data



Mini Bike Activity

The annual activity for mini bikes was also estimated using the similar approach like ATV and OMC. The CSUS survey included a small sample size (n=16) of mini bikes, making the analysis less robust than if a larger sample size was available. However, there is still a pattern showing more activity for newer mini bike as compared to older mini bike. As seen in Figure VI-6, a log linear regression was used to estimate the activity with respect to age. To prevent the annual activity from becoming negative, staff assumed the annual mileage will remain at 10 miles per year after age 16.

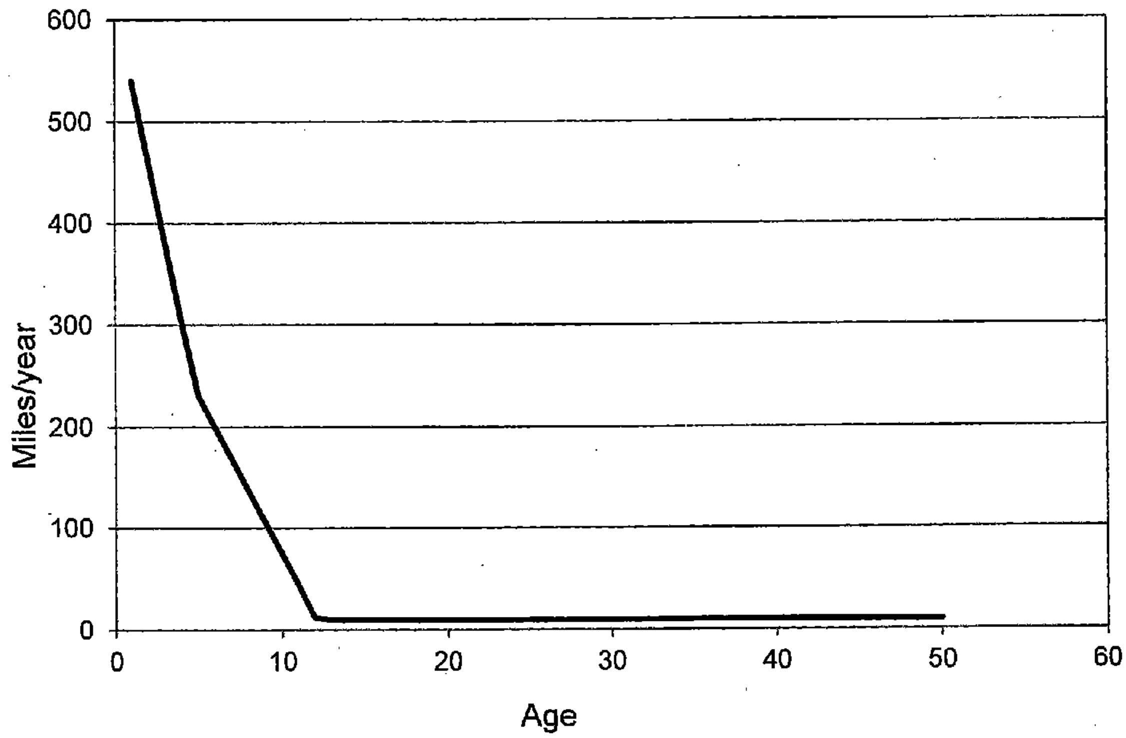
Figure VII-5. Mini Bike Activity from CSUS Survey



Golf Cart and Specialty Vehicle Activity

Gasoline powered golf carts are primarily used on golf courses, while specialty vehicles including sand cars and dune buddies distribution varies widely by activity. For example, golf cart is used more than special vehicle such as sand car. Activity information for the golf cart and specialty vehicle category was estimated based on internet data. Dune buggy activity was estimated from limited data from CSUS survey. Staff average these two activity estimates. Figure VI-6 shows the final activity by age for the golf carts and specialty vehicles.

Figure VII-6. Golf Cart and Specialty Vehicle Activity



The final activity by age for each type of OHRV is listed in Table VI-6. As shown in the table, the activity declines with respect to age. Since the CSUS survey focused primarily on OMC and ATV, there are limited survey data on golf cart and specialty vehicle and no data on snowmobile. There is definitely a need to have future activity for these types of vehicle. Moreover, there is a need to correlate activity with economic conditions which can only be done through multiple periodic surveys.

Table VII-6. Activity by Age for OHRVs

Age	OMC	ATV	Mini Bike	Snowmobile	Golf Cart and Specialty Vehicle
	Miles/year			Hours/year	
1	717	687	233	120	540
2	698	667	218	121	461
3	679	647	204	75	383
4	660	626	190	55	304
5	642	606	176	45	231
6	623	586	161	39	200
7	604	566	147	35	168
8	585	546	133	31	137
9	566	526	119	29	106
10	547	506	104	27	74
11	528	486	90	25	43
12	509	466	76	24	12
13	490	446	62	23	10
14	471	426	47	21	10
15	453	406	33	20	10
16	434	386	19	20	10
17	415	366	10	19	10
18	396	346	10	18	10
19	377	326	10	18	10
20	358	306	10	17	10
21	339	286	10	17	10
22	320	266	10	16	10
23	301	246	10	16	10
24	282	226	10	15	10
25	264	206	10	15	10
26	245	186	10	14	10
27	226	166	10	14	10
28	207	146	10	14	10
29	188	126	10	14	10
30	169	106	10	13	10
31	150	85	10	13	10
32	131	65	10	13	10
33	112	45	10	12	10
34	93	25	10	12	10
35	74	5	10	12	10
36	56	5	10	12	10
37	37	5	10	12	10
38	20	5	10	11	10
39	20	5	10	11	10
40	20	5	10	11	10
41 to 50					10
Averages	350	303	56	26	61

APPENDIX D. TEMPERATURE/RVP CORRECTION

The following illustrates an example showing how the Temperature/RVP correction is used to adjust the test data conducted from 65° to 105°F to a local ambient temperature. The following illustrates an example of correcting the test data from 65° F to 105°F to different local temperature and fuel RVP conditions.

Vapor Generation

	Input	Units
Tmin	65	F
Tmax	105	F
RVP	7	psi
Tank Size	3	gallons
Fill	0.50	
Vapor generation	2.77	g/gal
Vapor per day	4.15	g/day

Reddy Coefficients

A	B	C	
0.00875	0.2056	0.043	(10% ethanol, sea level)

Vapor generated (g/gal vapor space) = $A^{*} e^{B(RVP)} (e^{CT2} - e^{CT1})$

Vapor generated (grams) = Vapor (g/gallon vapor space) * Fuel Capacity (gal) * (1- Fill %)

Tank Permeation

Base EF	10.70	g/m2/day
Temp Correction at Tmin	0.46	F
Temp Correction at Tmax	2.16	F
Ave Temp Correction	1.31	F
Adjusted EF	14.03	g/m2/day
Tank Surface Area	0.34	m2
Final Emissions	4.82	g/day

Temp Correction = 0.03788519*EXP(0.03850818*T) relative to 85 F

Hose Permeation

Base EF	222.00	g/m2/day
Temp Correction at Tmin	0.73	F
Temp Correction at Tmax	3.43	F
Ave Temp Correction	2.08	F
Adjusted EF	462.19	g/m2/day
Hose Length	0.31	m
Hose Diameter	0.01	m
Hose Surface Area	0.01	m2
Final Emissions	2.81	g/day

Temp Correction = 0.06013899*EXP(0.03850818*T) relative to 73 F

Total Emission	11.79	g/day
"Diurnal"	7.97	g/day
"Resting"	3.82	g/day

Local Temp and Fuel RVP			Final Output (g/day)						Temp/RVP Correction	
RVP	T min	T max	Vapor Generation	Tank Permeation	Hose Permeation	Total	Diurnal	Resting Loss	Diurnal	Resting Loss
7	65	105	4.15	4.82	2.81	11.79	7.97	3.82	1.00	1.00
7.8	73.7	86.7	1.16	3.15	1.84	6.16	3.66	2.50	0.46	0.65
7.8	53.8	70.2	0.68	1.59	0.93	3.20	1.94	1.26	0.24	0.33
7.8	72.1	90.7	1.77	3.41	1.99	7.17	4.47	2.70	0.56	0.71
7.8	77	92.4	1.68	3.80	2.21	7.69	4.69	3.01	0.59	0.79
7.8	71.4	89.7	1.68	3.29	1.92	6.90	4.29	2.61	0.54	0.68
7.8	75.7	93.4	1.93	3.83	2.23	7.99	4.96	3.03	0.62	0.79

APPENDIX E. BENEFIT OF RED AND GREEN STICKER PROGRAM

Since 1972, the California Vehicle Code has required the registration of OHRVs with DMV. Registration is necessary for OHRVs to operate legally on California's public lands that are designated for OHRV use. Beginning with the 2003 model year, only OHRVs that meet California's exhaust emission standards are eligible for green sticker registration. OMCs and ATVs that are not certified to comply with California's exhaust emission standards remain eligible for OHRV registration, but they are issued a red sticker instead. The majority of these noncomplying OHRVs are powered by two-stroke engines, though there is a small percentage (less than 10%) of noncomplying four-stroke OHRVs as well.

In ozone nonattainment areas, OHRVs with red sticker registration are subject to a usage restriction. Specifically, this usage restriction prevents these noncomplying OHRVs from operating when ambient ozone levels exceed the federal 8-hour ozone standards. Such exceedances typically occur during the period between May and October.

To simply the calculation process, staff assumed the OHRVs subject to the Red and Green Sticker Program include OMCs and ATVs only as they comprise the majority of the population. In addition, staff assumed the following:

Only ozone nonattainment areas will be impacted by the Red and Green Sticker Program.

- Table VII-7 shows the ozone nonattainment areas based on federal 8-hour ozone standards (EPA, 2012).
- All 2002 and previous model year OHRVs have green stickers.
- All 2003 and newer model year OHRVs with two-stroke engines have red stickers.
- In ozone nonattainment areas, two-thirds of OHRVs with red sticker registration do not operate when ambient ozone standards are exceeded.
- 10% of 2003 and newer 4-stroke engines have red stickers.
- There are about 44 OHRV parks located in the nonattainment areas (PARKS, 2007). About 9 out of these 44 OHRV parks are open all year round for red stickered OHRV to ride.
- 50% of red sticker vehicles that would have otherwise operated in a non-attainment area during the summer will not operate.

Table VII-7. California Nonattainment Area Based on Federal 8-hour Ozone Standards

Area	County
Calaveras County	Calaveras
Chico (Butte County)	Butte
Imperial County	Imperial
Kern County (Eastern Kern)	Kern (p)
Los Angeles-San Bernardino Counties (West Mojave Desert)	Los Angeles (p)
	San Bernardino (p)
Los Angeles-South Coast Air Basin	Los Angeles (p)
	Orange
	Riverside (p)
	San Bernardino (p)
Mariposa County	Mariposa
Nevada County (Western part)	Nevada (p)
Riverside County (Coachella Valley)	Riverside (p)
Sacramento Metro	El Dorado (p)
	Placer (p)
	Sacramento
	Solano (p)
	Sutter (p)
	Yolo
San Diego County	San Diego
San Francisco Bay Area	Alameda
	Contra Costa
	Marin
	Napa
	San Francisco
	San Mateo
	Santa Clara
	Solano (p)
	Sonoma (p)
San Joaquin Valley	Fresno
	Kern (p)
	Kings
	Madera
	Merced
	San Joaquin
	Stanislaus
	Tulare
San Luis Obispo (Eastern San Luis Obispo)	San Luis Obispo (p)
Tuscan Buttes	Tehama (p)
Ventura County	Ventura (p)
Morongo Areas of Indian Country (Morongo Band of Mission Indians)	Areas of Indian Country
Pechanga Areas of Indian Country (Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation)	Areas of Indian Country
Rest of state is unclassifiable/attainment	

(p) = partial county

APPENDIX F. GARAGE TEMPERATURE CORRECTION

OHRVs are assumed to be stored inside a garage when not in use. The model adjusts for this assumption by applying a garage temperature correction factor to adjust it from standard testing conditions (65° to 105°F) ambient temperature profiles that would be experienced in a garage in each appropriate region. Table VII-8 lists the 13 garages that were recorded for internal garage temperature and the respective ambient temperature outside the garage from the Sierra Research study. An additional dataset from ARB's garage study is listed in Table VII-9.

Table VII-8. Sierra Research Study of 13 Garage Temperature Profiles

Garage No	Start Date	Time	End Date	Time	Garage Temperatures			Ambient Temperatures		
					Min	Max	Diff	Min	Max	Diff
1	9-Jul-10	18:00	16-Jul-10	20:35	68.9	101.3	32.4	57.9	102	44.1
2	9-Jul-10	18:00	16-Jul-10	20:35	74.3	103.1	28.8	57.9	102	44.1
3	2-Jul-10	18:00	9-Jul-10	13:00	75.2	97.7	22.5	55	98.1	43.1
4	2-Jul-10	18:00	9-Jul-10	9:00	63.5	88.7	25.2	55	98.1	43.1
5	25-Jun-10	18:01	2-Jul-10	20:36	64.4	86.9	22.5	52	101	49
6	25-Jun-10	18:01	2-Jul-10	9:36	71.6	96.8	25.2	55	102.9	47.9
7	26-Jun-10	0:56	2-Jul-10	9:46	68	93.2	25.2	55	102.9	47.9
8	7-May-10	11:42	14-May-10	11:27	68.9	84.2	15.3	40.1	89.6	49.5
9	18-Jun-10	18:01	25-Jun-10	9:51	63.5	88.7	25.2	45	91	46
10	3-Jun-10	4:01	10-Jun-10	6:36	72.5	87.8	15.3	51.8	89.6	37.8
11	18-Jun-10	18:00	25-Jun-10	9:30	61.7	90.5	28.8	45	91	46
12	7-May-10	11:40	14-May-10	9:00	57.2	86	28.8	36.5	90.5	54
13	18-Jun-10	18:01	25-Jun-10	10:01	68	95.9	27.9	45	91	46

Table VII-9. ARB Garage Temperature Study

Season	Garage Temperature			Ambient Temperature		
	Min	Max	Diff	Min	Max	Diff
Average garage profile during winter (n=4)	41	52	11	39	57	18
Average garage profile during summer (n=4)	76	93	17	63	94	31

From the data listed in Table VII-8 and Table VII-9, the average minimum, maximum, and difference were calculated for ambient and garage temperatures. From these averages, a garage/ambient ratios were developed as shown in Table VII-10

Table VII-10. Summary of Ratios of Garage Temperature to Ambient Temperature

Data Source	Garage/Ambient Ratio Min Temp	Garage/Ambient Ratio Max Temp	Garage/Ambient Ratio Difference
Sierra Research 95° to 105° F Data	1.253	0.944	0.57
Sierra Research 85° to 90° F Data	1.487	0.982	0.506
ARB garage data (summer)	1.206	0.989	0.548
ARB garage data (winter)	1.051	0.912	0.611

The combined data that contained different temperature profiles were further segregated into different ambient temperature ranges. The temperature ranges were 0° to 70°F, 71° to 95°F, and 95°+ F. The maximum ambient temperature determined the corresponding garage/ambient ratio to use to calculate the garage temperature. Table VII-11 lists the maximum ambient temperature criteria and the corresponding ratios. The garage maximum temperature ratio estimates the highest garage temperature inside the garage. The garage temperature difference ratio estimates the range of temperature inside in the garage as compared the range of ambient temperature outside the garage.

Table VII-11. Final Criteria and Ratio Used in Estimating Garage Temperature

Max Ambient Temperature Criteria	Garage Max Temp Ratio	Garage Temp Difference Ratio	Data Source
0° - 70°F	0.91	0.61	ARB
71° - 95°F	0.97	0.52	Sierra Research and ARB
95°+ F	0.94	0.57	Sierra Research

The following steps were used to estimate the garage temperature range (using the information listed in Table VII-10) with a known ambient temperature range.

- For a given GAI, ambient minimum temperature, ambient maximum temperature, and ambient temperature differences are known.
- Calculate garage max temperature using criteria and corresponding Garage Maximum Temperature Ratio.
- Calculate garage temperature difference using criteria and corresponding Garage Temperature Difference Ratio.
- Find garage minimum temperature from calculated garage temperature difference and garage max temperature.
- With known garage temperatures, garage correction factor can be calculated from test temperature profile using Temperature/RVP Correction as described in Appendix D.

For example:
Ambient temperature = 65° to 82° F

Garage maximum temperature = 82° F x 0.97 = 79.5° F
Garage temperature difference = (82° - 65° F) x 0.52 = 8.8° F
Garage minimum temperature = 79.5° F - 8.8° F = 70.7° F
Estimated garage temperature = 70.7° to 79.5° F

APPENDIX G. ADJUSTMENT OF EMISSIONS FROM INACTIVE VEHICLES

Historically, our evaporative emissions assessments for diurnal and resting loss have been based on the assumption that the liquid phase fuel composition remains constant over the course of the year. This assumption is reasonable when vehicles are regularly operated and refueled; however, in this assessment we are modeling diurnal and resting emissions from vehicles that are stored but not operated or refueled during the year. When evaporative emissions occur over months to year long periods, it is reasonable to expect, depending on tank size, that the effective vapor pressure of the fuel in the vehicle tank will decrease over time as volatile components of the fuel are evaporated. This process is called fuel weathering.

Based on the principle of vapor-liquid equilibrium (VLE) partition of gasoline, staff estimated the daily loss of emissions in an uncontrolled fuel tank, where the gasoline vapor has no restriction to enter or leave the fuel tank. Instead of including all gasoline species in the vapor-liquid mass balance, staff simplified the mass balance by selecting 12 major components in the gasoline. With this method, the vapors expelled from the tank are assumed to be saturated (in equilibrium with the liquid). The volatilized components are deducted from the liquid phase and a new vapor-liquid equilibrium is established the next day.

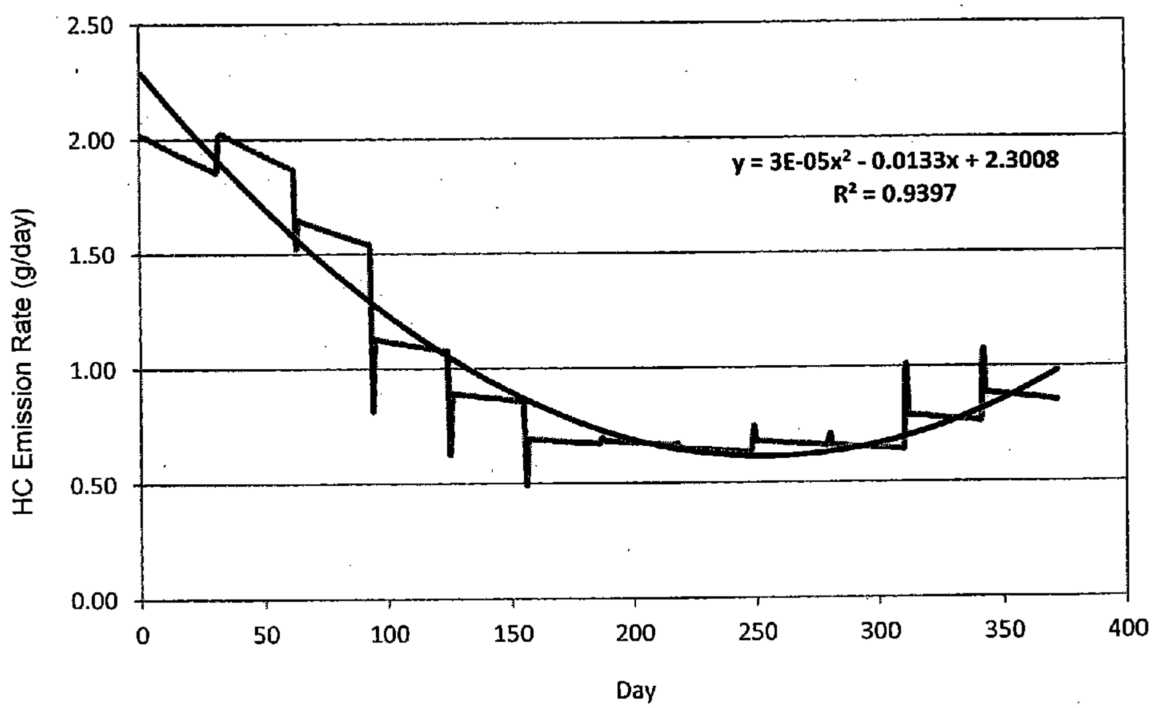
Our analysis started by assuming an OMC tank that was 50% full with Phase-II reformulated gasoline. We assumed gasoline density of 6.2 lbs/gallon with a 7 psi relative vapor pressure. We calculated emissions over a 12 month period using Los Angeles County meteorological conditions shown in Table VII-12. To model the depletion of volatile species, staff applied the VLE mass balance method. As a result of daily rise of temperature, the light ends of the gasoline (largely butane), which have a lower boiling point than other gasoline constituents, will evaporate first.

As seen in Figure VII-7, the average emission rate is higher during summer, lower during winter, and rises again during spring. A regression equation was also developed to help estimate the annual emissions from the calculated emissions rates using the liquid-vapor equilibrium approach.

Table VII-12. Temperature Range in Los Angeles County

Month	Min. Temp (F)	Max. Temp (F)
Jan	49.1	65
Feb	49.6	65.1
Mar	51.2	66.9
Apr	52.4	67.7
May	57.1	72.8
Jun	60.7	76.6
Jul	64.8	82
Aug	64.6	82.9
Sep	63.2	80.8
Oct	58.6	74.8
Nov	53.6	69.8
Dec	48.8	64.6

Figure VII-7. Estimated Monthly HC Emission Rate from Vapor-Liquid Equilibrium



Staff compared the weathered effect on two temperature profiles:

Los Angeles County 12-month Temperature Profile

Based on the VLE (weathered) mass balance over 12 months of Los Angeles County temperature profiles, the annual emissions is 385 g/year as daily evaporation rate is a small fraction of the liquid gasoline in the fuel tank. The annual emissions from "un-weathered" rate are 737 g/year (assuming 2.03 g/day *365 day/year).

Thus, the annual emissions calculated from VLE mass balance is about 53% of that calculated from the "un-weathered" calculation. The adjustment factor for this weathering and temperature profile scenario is 0.53.

65° to 105° F Temperature Profile

Based on the VLE (weathered) mass balance over 365 days of temperature profile at 65° to 105° F, the annual emissions are 1870 g/year. However, the annual emissions from "un-weathered" rate are 2900 g/year (assuming 7.94 g/day* 365 days/year). The adjustment factor for this weathering and temperature profile is 0.64.

These results are summarized in Table VII-13. In this assessment, to reflect fuel weathering, inactive vehicle diurnal and resting emissions are reduced by 47% (1-0.53).

Table VII-13. Emissions Estimated from Weathered and Un-weathered Conditions

Temp Profile	Method	gram/yr.	gal/yr.	% of 5 gal tank	Adjustment Factor
LA County (12 months)	Weathered (VLE mass balance)	385	0.14	2.7%	0.53
	Un-weathered	737	0.26	5.2%	
65° -105° F	Weathered (VLE mass balance)	1870	0.66	13.0%	0.64
	Un-weathered	2900	1.03	20.6%	

APPENDIX H. DETAILED BREAKDOWN OF EVAPORATIVE EMISSION BENEFITS

Figure VII-8. Detailed ROG and NOx Emission Benefits for State and Local Districts (TPD)

2020			
State	Baseline	Proposed Rule	Benefit
Hot Soak	0.69	0.61	0.08
Running Loss	1.59	1.42	0.17
Diurnal	10.22	9.13	1.09
Evap (Subtotal)	12.50	11.16	1.34
Exhaust (Subtotal)	4.85	4.85	0.00
ROG (total)	17.35	16.01	1.34
NOx	0.83	0.83	0.00
Bay Area AQMD	Baseline	Proposed Rule	Benefit
Hot Soak	0.08	0.07	0.01
Running Loss	0.19	0.17	0.02
Diurnal	1.20	1.07	0.13
Evap (Subtotal)	1.47	1.31	0.16
Exhaust (Subtotal)	0.57	0.57	0.00
ROG (total)	2.04	1.88	0.16
NOx	0.10	0.10	0.00
SJV APCD	Baseline	Proposed Rule	Benefit
Hot Soak	0.11	0.10	0.01
Running Loss	0.26	0.23	0.03
Diurnal	1.66	1.48	0.18
Evap (Subtotal)	2.03	1.81	0.22
Exhaust (Subtotal)	0.85	0.85	0.00
ROG (total)	2.88	2.66	0.22
NOx	0.15	0.15	0.00
SCAQMD	Baseline	Proposed Rule	Benefit
Hot Soak	0.21	0.19	0.02
Running Loss	0.49	0.44	0.05
Diurnal	3.16	2.85	0.31
Evap (Subtotal)	3.86	3.48	0.38
Exhaust (Subtotal)	0.47	0.47	0.00
ROG (total)	4.33	3.95	0.38
NOx	0.08	0.08	0.00

2023			
State	Baseline	Proposed Rule	Benefit
Hot Soak	0.72	0.53	0.19
Running Loss	1.65	1.23	0.42
Diurnal	10.63	7.89	2.74
Evap (Subtotal)	13.00	9.65	3.35
Exhaust (Subtotal)	4.38	4.38	0.00
ROG (total)	17.38	14.03	3.35
NOx	0.91	0.91	0.00
Bay Area AQMD	Baseline	Proposed Rule	Benefit
Hot Soak	0.08	0.06	0.02
Running Loss	0.19	0.14	0.05
Diurnal	1.25	0.92	0.33
Evap (Subtotal)	1.52	1.12	0.40
Exhaust (Subtotal)	0.52	0.52	0.00
ROG (total)	2.04	1.64	0.40
NOx	0.11	0.11	0.00
SJV APCD	Baseline	Proposed Rule	Benefit
Hot Soak	0.12	0.09	0.03
Running Loss	0.27	0.20	0.07
Diurnal	1.73	1.28	0.45
Evap (Subtotal)	2.12	1.57	0.55
Exhaust (Subtotal)	0.74	0.74	0.00
ROG (total)	2.86	2.31	0.55
NOx	0.16	0.16	0.00
SCAQMD	Baseline	Proposed Rule	Benefit
Hot Soak	0.22	0.17	0.05
Running Loss	0.51	0.39	0.12
Diurnal	3.29	2.49	0.80
Evap (Subtotal)	4.02	3.05	0.97
Exhaust (Subtotal)	0.44	0.44	0.00
ROG (total)	4.46	3.49	0.97
NOx	0.09	0.09	0.00

2035			
State	Baseline	Proposed Rule	Benefit
Hot Soak	0.83	0.29	0.54
Running Loss	1.92	0.66	1.26
Diurnal	12.37	4.26	8.11
Evap (Subtotal)	15.12	5.21	9.91
Exhaust (Subtotal)	3.96	3.96	0.00
ROG (total)	19.08	9.17	9.91
NOx	1.13	1.13	0.00
Bay Area AQMD	Baseline	Proposed Rule	Benefit
Hot Soak	0.10	0.03	0.07
Running Loss	0.23	0.07	0.16
Diurnal	1.45	0.48	0.97
Evap (Subtotal)	1.78	0.58	1.20
Exhaust (Subtotal)	0.47	0.47	0.00
ROG (total)	2.25	1.05	1.20
NOx	0.14	0.14	0.00
SJV APCD	Baseline	Proposed Rule	Benefit
Hot Soak	0.14	0.05	0.09
Running Loss	0.31	0.11	0.20
Diurnal	2.01	0.69	1.32
Evap (Subtotal)	2.46	0.85	1.61
Exhaust (Subtotal)	0.62	0.62	0.00
ROG (total)	3.08	1.47	1.61
NOx	0.20	0.20	0.00
SCAQMD	Baseline	Proposed Rule	Benefit
Hot Soak	0.26	0.09	0.17
Running Loss	0.60	0.22	0.38
Diurnal	3.84	1.40	2.44
Evap (Subtotal)	4.70	1.71	2.99
Exhaust (Subtotal)	0.42	0.42	0.00
ROG (total)	5.12	2.13	2.99
NOx	0.11	0.11	0.00

APPENDIX I. INSTALLATION AND USER GUIDE

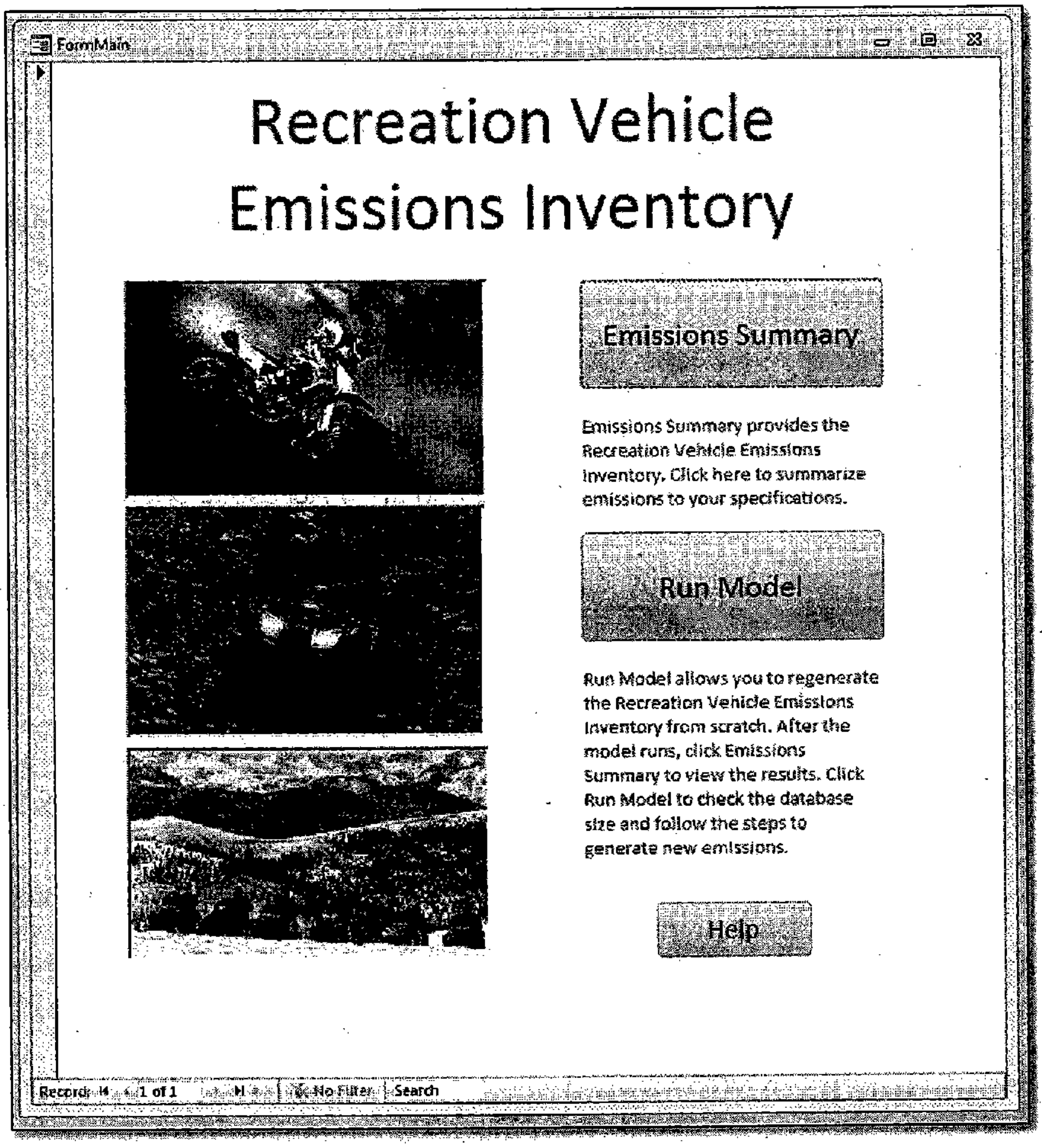
Download Instruction and Computer Specification:

- Zip - Use any zipping utility to unzip the file. Most operating systems like Windows come with a utility like 'WinZip'. Others can be downloaded off the internet along with their user guides.
- Computer Requirements: Your computer needs to have sufficient memory to store and run the model (these requirements are fairly small). Unzipped the file will be about 1.2GB. When running the model it can grow up to 2.0GB. Model runtimes can vary depending on the processing power of the computer, estimates are provided in the user interface.
- Microsoft Access: The Recreation Vehicle Emissions Inventory model runs as an Access database file. The model was developed in Microsoft Access 2010 previous versions of Access may not support all the model functionality.
- **Download Warnings:** When the database is first loaded onto the computer, Access will warn the user of possible unsafe code in the program. It is important to allow the program to open without any restrictions. **This means selecting options when Access opens that ENABLE the program content** (if prompted with a warning such as 'Do you want to allow Access to open with these unsafe expressions' **CLICK YES, OPEN, or ENABLE**).
    - Microsoft Access allows a user to define security restrictions that will apply to every file on a user's computer. If security restrictions have been set too restrictively, Access will not allow the Emissions Inventory model to open or run properly. The user might need to change the settings in the 'trust center', information about having the proper settings for Microsoft Access are available on Microsoft's website (one common setting is having the macro setting that does not inform the user when content has been blocked, in this case the question above will not come up).
- ***Note: allow a couple minutes for the model to compact itself when closing Access, this is an important step in managing space. If the model becomes unstable (errors or warnings), close the form then close Access and reopen. If problems persist, the model might be corrupt and a new version can be downloaded from the ARB website.**

Model Functionality (instructions also available within the model):

1. *Main User Interface*

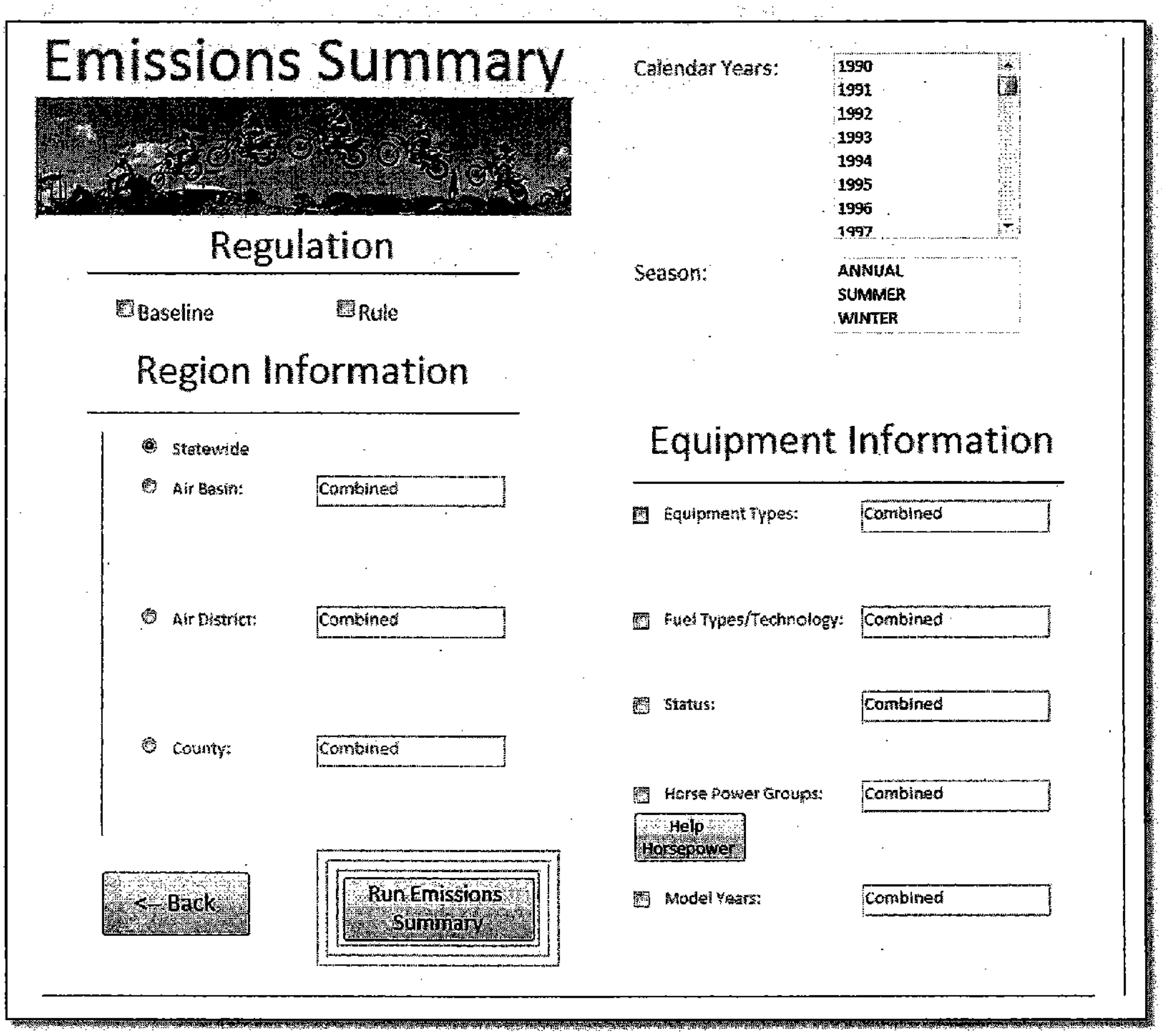
   When the Model is opened, the Main user interface opens (below). From here the user can choose to use two parts of the model: Emissions Summary or Run Model. Also available is a help button that has some important information.



2. *Emissions Summary*

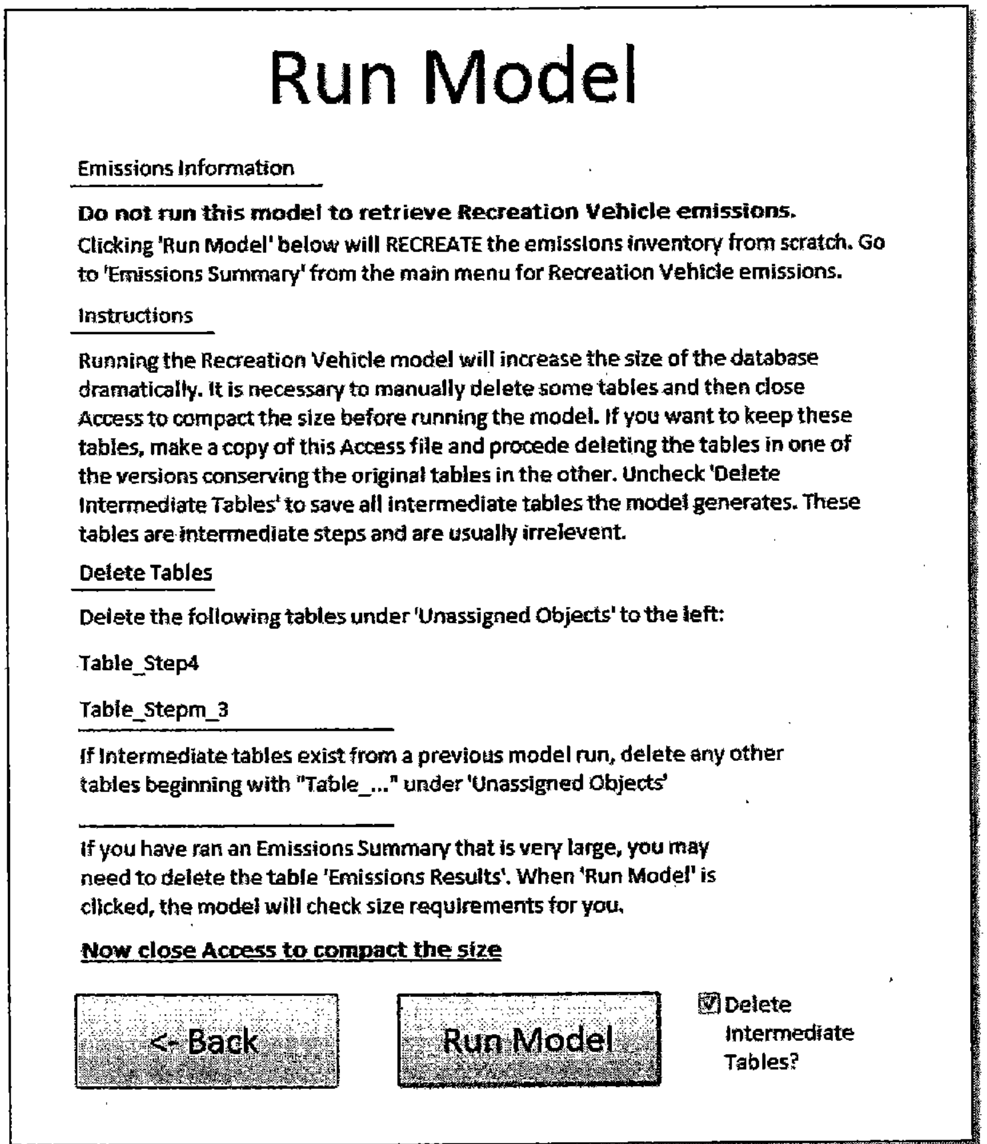
   Clicking this button navigates to the Emissions Summary page (below) Estimate California Recreation Vehicle emissions for any combination of equipment type, fuel type, status, horsepower, model year, calendar year, season, and/or region for baseline or rule emissions.

Running the Emissions Summary by model year dramatically increases the runtime and restricts the user to selecting one region at a time. Equipment and fuel types must be selected with model year requests.



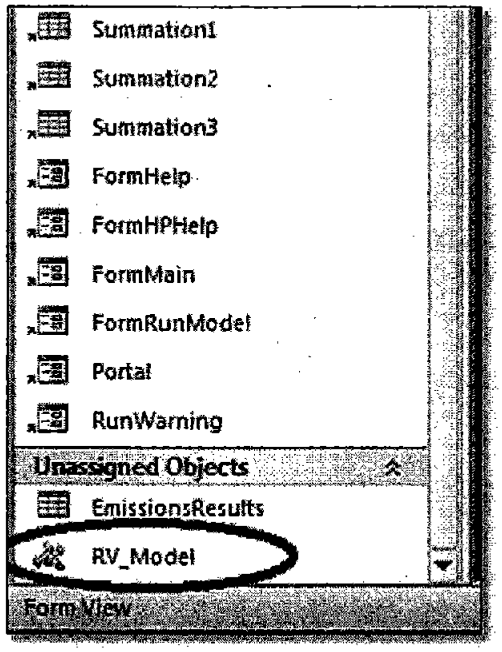
3. *Run Model*

The 'Run Model' window is only used to run a simulation of the model (below). READ ALL THE INSTRUCTIONS ON THIS PAGE BEFORE USING THE RUN MODEL PROGRAM. This portion of the model is not for viewing the emissions inventory. Running the model recreates emissions from scratch. This is not necessary as the model comes with emissions already loaded and available through the Emissions Summary window.



4. *Model Code*

The code for running the simulation of the model is available in the left pane under 'Unassigned Objects'. Double-clicking Either 'RV_Model' will open the Visual Basic Editor for Access. For questions about navigating Visual Basic Editor use Microsoft's 'Help' or online advice.



Please read all instructions provided in the model including this user guide. If there is still any confusion, feel free to contact the Mobile Source Analysis Branch at msei@arb.ca.gov.

APPENDIX J. SOURCE CODE OF RV2013

The following code is found in the Recreation Vehicle Model. There are other modules which control the user interface but the module below creates the official Recreation Vehicle Inventory.

Function RunModel()

'Methodology

'The purpose of the comments throughout the code is to help understand how the inventory methodology has been implemented.

'For an understanding of inventory methodology download the associated Recreation Vehicle Reports. Trying to understand the overall methodology is best accomplished using these other resources.

'Model Speficifications

'The Recreation Vehicle Emissions Inventory estimates emissions for OHRVs in California

'using the SQL code below developed in Visual Basic for Access. Each line of code (DoCmd...etc) accomplishes a step

'using the SQL syntax for running queries in Access. The logic can be seen below in SQL code format or can be viewed

'as a query by cutting and pasting the SQL code into an Access query while the query is in 'SQL' view.

'For information about how to use Access or VBA this way seek out Microsoft's help books, online tutorials,

'or application HELP tools

'Comments

'The comments throughout the code are to explain how the model logically accomplishes a piece of the methodology.

'There are 4 major sections of code. They each have an explanation of their significance before them:

'Beginning Calculations, Red and Green Sticker Program adjustment, Model Year Percentages, Additional Pollutants

'Model Year Percentages and Red and Green Sticker Program

'In order to fit the Recreation Vehicle Inventory into Microsoft Access many of the model steps are to store

'information efficiently. For example, the Model Year Percentages section does not alter the final emissions, 'it simply calculates a model distribution from a previous step and stores it efficiently. Also, the

'Red and Green Sticker Program section is methodologically extremely simple (multiply emissions by a adjustment value).

'However, the many steps under this section accomplish this multiplication with a derived coefficient so that

'it doesn't need to be done at the model year level. As mentioned above in 'Methodology', understanding inventory

'methodology is better accomplished with the associated write-ups, not by reading this code.

'Procedures

'The other modules under 'Microsoft Access Class Objects' control the user interface. The code below creates the

'inventory emissions but these other modules can be explored if a full understanding is necessary. Some methodological

'steps are copied from below into these other modules for model year requests.

'However, no new or unique methodology is found there

DoCmd.SetWarnings False

'Beginning Calculations

'First emissions are calculated for the regions around California (Air Basins, Air Districts, and Counties).

'Emissions are calculated by model year without regions and then are collapsed without model year.

'Once they are expanded to regions, they still need to be adjusted by the Red and Green Sticker Program.

'This is accomplished by the following section 'Red and Green Sticker Program adjustment'

''

'Step01

'INTO Table_Step1

'Split population by HP group and Fuel technology

```
'Pop = Pop * HP_Split * FuelTech_Split

'Activity = Activity * HP_Split * FuelTech_Split

DoCmd.RunSQL "SELECT POP.CATEGORY, POP.STATUS, POP.CY, POP.MY,
POP.AGE, [STRK-FUEL-TECH].[STRK-FUEL-TECH], [STRK-FUEL-TECH].HPGRP,
[POP]![POP]*[STRK-FUEL-TECH]![STRK-FUEL--TECH-SPLT]*[STRK-FUEL-
TECH]![HPGRP-SPLT] AS POP2, [POP]![POP]*[STRK-FUEL-TECH]![STRK-FUEL--
TECH-SPLT]*[STRK-FUEL-TECH]![HPGRP-SPLT]*[ACT]![ANNUAL_USE] AS [Act-Anl]
INTO Table_Step1 FROM (((POP INNER JOIN [STRK-FUEL-TECH] ON (POP.MY =
[STRK-FUEL-TECH].MY) AND (POP.CATEGORY = [STRK-FUEL-
TECH].CATEGORY)) INNER JOIN ACT ON (ACT.CATEGORY = POP.CATEGORY)
AND (POP.AGE = ACT.AGE) AND (POP.STATUS = ACT.STATUS)) INNER JOIN
EQUIP ON (EQUIP.STATUS = ACT.STATUS) AND (EQUIP.CATEGORY = [STRK-
FUEL-TECH].CATEGORY) AND ([STRK-FUEL-TECH].[STRK-FUEL-TECH] =
EQUIP.[STRK-FUEL-TECH]) AND ([STRK-FUEL-TECH].HPGRP = EQUIP.HPGRP))
INNER JOIN LOAD ON (LOAD.CATEGORY = EQUIP.CATEGORY) AND
(EQUIP.HPGRP = LOAD.HPGRP) AND (EQUIP.[STRK-FUEL-TECH] = LOAD.[STRK-
FUEL-TECH]);"


'Step02

'INTO Table_Step2

'Calculate Emissions (Not seasonally or spatially adjusted yet. Emissions: tons / day

'Pollutant = Activity * [ ZeroHour + ( CummulativeUse * DetriorationRate ) ] * AvgHP *
Load / ( 365 * 454 * 2000 )

'See SOx, CO2, and Hydrocarbon loss emission calculations

DoCmd.RunSQL "SELECT Table_Step1.*, [Table_Step1]![Act-Anl]*([EF]![HC-
ZH]+([ACT]![CUMULATIVE_USE]*[EF]![HC-DR]))*IIf([EF]![HC-
Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS HC,
[Table_Step1]![Act-Anl]*([EF]![CO-ZH]+([ACT]![CUMULATIVE_USE]*[EF]![CO-
DR]))*IIf([EF]![CO-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000
AS CO, [Table_Step1]![Act-Anl]*([EF]![NOX-
ZH]+([ACT]![CUMULATIVE_USE]*[EF]![NOX-DR]))*IIf([EF]![NOX-
Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS NOX,
[Table_Step1]![Act-Anl]*([EF]![PM-ZH]+([ACT]![CUMULATIVE_USE]*[EF]![PM-
DR]))*IIf([EF]![PM-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000
AS PM, [Table_Step1]![Act-Anl]*([EF]![SOX-
ZH]+([ACT]![CUMULATIVE_USE]*[EF]![SOX-DR]))*IIf([EF]![SOX-
Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS SOX,
[Table_Step1]![Act-Anl]*([EF]![CO2-EF])*IIf([EF]![CO2-Units]='G/MI',1,[EQUIP]![AVG-
HP]*[EQUIP]![LOAD])*[LOAD]![CF-CO2]/365/454/2000 AS CO2, " & _
```

```
"[Table_Step1]![POP2]*[EQUIP]![STARTS]*([EF]![HC-HS]+[Table_Step1]![AGE]*[EF]![HC-HS-DR])/365/454/2000 AS [HC-HotSoak], [Table_Step1]![POP2]*([EF]![HC-DIU]+[Table_Step1]![AGE]*[EF]![HC-DIU-DR])/454/2000 AS [HC-DIURNAL], [Table_Step1]![POP2]*([EF]![HC-REST]+[Table_Step1]![AGE]*[EF]![HC-REST-DR])/454/2000 AS [HC-RESTING], [Table_Step1]![Act-Anl]*([EF]![HC-RUN]+[Table_Step1]![AGE]*[EF]![HC-RUN-DR])/365/454/2000 AS [HC-RL], [Table_Step1]![Act-Anl]*([EF_Scenario]![HC-ZH]+([ACT]![CUMULATIVE_USE]*[EF_Scenario]![HC-DR]))*IIf([EF_Scenario]![HC-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS HC_Scenario, [Table_Step1]![Act-Anl]*([EF_Scenario]![CO-ZH]+([ACT]![CUMULATIVE_USE]*[EF_Scenario]![CO-DR]))*IIf([EF_Scenario]![CO-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS CO_Scenario, [Table_Step1]![Act-Anl]*([EF_Scenario]![NOX-ZH]+([ACT]![CUMULATIVE_USE]*[EF_Scenario]![NOX-DR]))*IIf([EF_Scenario]![NOX-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS NOX_Scenario, " & _

"[Table_Step1]![Act-Anl]*([EF_Scenario]![PM-ZH]+([ACT]![CUMULATIVE_USE]*[EF_Scenario]![PM-DR]))*IIf([EF_Scenario]![PM-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS PM_Scenario, [Table_Step1]![Act-Anl]*([EF_Scenario]![SOX-ZH]+([ACT]![CUMULATIVE_USE]*[EF_Scenario]![SOX-DR]))*IIf([EF_Scenario]![SOX-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])/365/454/2000 AS SOX_Scenario, [Table_Step1]![Act-Anl]*([EF_Scenario]![CO2-EF])*IIf([EF_Scenario]![CO2-Units]='G/MI',1,[EQUIP]![AVG-HP]*[EQUIP]![LOAD])*[LOAD]![CF-CO2]/365/454/2000 AS CO2_Scenario, [Table_Step1]![POP2]*[EQUIP]![STARTS]*([EF_Scenario]![HC-HS]+[Table_Step1]![AGE]*[EF_Scenario]![HC-HS-DR])/365/454/2000 AS [HC-HotSoak_Scenario], [Table_Step1]![POP2]*([EF_Scenario]![HC-DIU]+[Table_Step1]![AGE]*[EF_Scenario]![HC-DIU-DR])/454/2000 AS [HC-DIURNAL_Scenario], [Table_Step1]![POP2]*([EF_Scenario]![HC-REST]+[Table_Step1]![AGE]*[EF_Scenario]![HC-REST-DR])/454/2000 AS [HC-RESTING_Scenario], " & _

"[Table_Step1]![Act-Anl]*([EF_Scenario]![HC-RUN]+[Table_Step1]![AGE]*[EF_Scenario]![HC-RUN-DR])/365/454/2000 AS [HC-RL_Scenario] INTO Table_Step2 FROM EF_Scenario INNER JOIN ((EQUIP INNER JOIN (ACT INNER JOIN ((Table_Step1 INNER JOIN EF ON (Table_Step1.CATEGORY = EF.CATEGORY) AND (Table_Step1.[STRK-FUEL-TECH] = EF.[STRK-FUEL-TECH]) AND (Table_Step1.HPGRP = EF.HPGRP) AND (Table_Step1.MY = EF.MY)) " & _

"INNER JOIN FRACTIONS ON (Table_Step1.CATEGORY = FRACTIONS.CATEGORY) AND (Table_Step1.[STRK-FUEL-TECH] = FRACTIONS.[STRK-FUEL-TECH]) AND (Table_Step1.CY = FRACTIONS.CY)) ON (ACT.CATEGORY = Table_Step1.CATEGORY) AND (ACT.STATUS = Table_Step1.STATUS) AND (ACT.AGE = Table_Step1.AGE)) ON (EQUIP.CATEGORY = Table_Step1.CATEGORY) AND (EQUIP.STATUS = Table_Step1.STATUS) AND (EQUIP.[STRK-FUEL-TECH] = Table_Step1.[STRK-FUEL-TECH]) AND (EQUIP.HPGRP = Table_Step1.HPGRP)) INNER JOIN LOAD ON
```

(Table_Step1.CATEGORY = LOAD.CATEGORY) AND (Table_Step1.[STRK-FUEL-TECH] = LOAD.[STRK-FUEL-TECH]) AND (Table_Step1.HPGRP = LOAD.HPGRP)) ON (EF_Scenario.CATEGORY = Table_Step1.CATEGORY) AND (EF_Scenario.HPGRP = Table_Step1.HPGRP) AND (EF_Scenario.[STRK-FUEL-TECH] = Table_Step1.[STRK-FUEL-TECH]) AND (EF_Scenario.MY = Table_Step1.MY);"

```
'Step03

'INTO Table_Step3

'Sum without Model Years for spatial allocation

DoCmd.RunSQL "SELECT Table_Step2.CATEGORY, Table_Step2.STATUS, Table_Step2.CY, Table_Step2.[STRK-FUEL-TECH], Table_Step2.HPGRP, Sum(Table_Step2.POP2) AS SumOfPOP2, Sum(Table_Step2.[Act-Anl]) AS [SumOfAct-Anl], Sum(Table_Step2.HC) AS SumOfHC, Sum(Table_Step2.CO) AS SumOfCO, Sum(Table_Step2.NOX) AS SumOfNOX, Sum(Table_Step2.PM) AS SumOfPM, Sum(Table_Step2.SOX) AS SumOfSOX, Sum(Table_Step2.CO2) AS SumOfCO2, Sum(Table_Step2.[HC-HotSoak]) AS [SumOfHC-HotSoak], Sum(Table_Step2.[HC-DIURNAL]) AS [SumOfHC-DIURNAL], Sum(Table_Step2.[HC-RESTING]) AS [SumOfHC-RESTING], Sum(Table_Step2.[HC-RL]) AS [SumOfHC-RL], Sum(Table_Step2.HC_Scenario) AS SumOfHC_Scenario, Sum(Table_Step2.CO_Scenario) AS SumOfCO_Scenario, Sum(Table_Step2.NOX_Scenario) AS SumOfNOX_Scenario, Sum(Table_Step2.PM_Scenario) AS SumOfPM_Scenario, Sum(Table_Step2.SOX_Scenario) AS SumOfSOX_Scenario, Sum(Table_Step2.CO2_Scenario) AS SumOfCO2_Scenario, Sum(Table_Step2.[HC-HotSoak_Scenario]) AS [SumOfHC-HotSoak_Scenario], " & _

"Sum(Table_Step2.[HC-DIURNAL_Scenario]) AS [SumOfHC-DIURNAL_Scenario], Sum(Table_Step2.[HC-RESTING_Scenario]) AS [SumOfHC-RESTING_Scenario], Sum(Table_Step2.[HC-RL_Scenario]) AS [SumOfHC-RL_Scenario] INTO Table_Step3 FROM Table_Step2 GROUP BY Table_Step2.CATEGORY, Table_Step2.STATUS, Table_Step2.CY, Table_Step2.[STRK-FUEL-TECH], Table_Step2.HPGRP;"

'Step04

'INTO Table_Step4

'Allocate to GAI, GAI adjustment factors, Seasonality adjustment factors

'Pollutant = Pollutant * (GAI correction factors) * seasonality adjustments

DoCmd.RunSQL "SELECT CInt(1) AS GR_ID, Table_Step3.CATEGORY, Table_Step3.STATUS, Table_Step3.CY, Table_Step3.[STRK-FUEL-TECH],
```

Table_Step3.HPGRP, SA.GAI, GAI.AirBasinID, GAI.DistrictID, GAI.CountyID, CRCTN.SEASON, [Table_Step3]![SumOfPOP2]*[SA]![SA-OPER] AS [POP-Alloc], [Table_Step3]![SumOfPOP2]*[SA]![SA-STORAGE] AS [POP-Stored], [Table_Step3]![SumOfAct-Anl]*[SA]![SA-OPER] AS [Act-Anl], [Table_Step3]![SumOfHC]*[SA]![SA-OPER]*[CRCTN]![CF-T-HC]*[CRCTN]![CF-H-HC]*[CRCTN]![CF-F-HC]*[SEASON]![SEASONALITY] AS [HC-Exhaust], [Table_Step3]![SumOfCO]*[SA]![SA-OPER]*[CRCTN]![CF-T-CO]*[CRCTN]![CF-H-CO]*[CRCTN]![CF-F-CO]*[SEASON]![SEASONALITY] AS [CO-Exhaust], [Table_Step3]![SumOfNOX]*[SA]![SA-OPER]*[CRCTN]![CF-T-NOX]*[CRCTN]![CF-H-NOX]*[CRCTN]![CF-F-NOX]*[SEASON]![SEASONALITY] AS [NOX-Exhaust], [Table_Step3]![SumOfPM]*[SA]![SA-OPER]*[CRCTN]![CF-T-PM]*[CRCTN]![CF-H-PM]*[CRCTN]![CF-F-PM]*[SEASON]![SEASONALITY] AS [PM-Exhaust], " & _

"[Table_Step3]![SumOfSOX]*[SA]![SA-OPER]*[CRCTN]![CF-T-SOX]*[CRCTN]![CF-H-SOX]*[CRCTN]![CF-F-SOX]*[SEASON]![SEASONALITY] AS [SOX-Exhaust], [Table_Step3]![SumOfCO2]*[SA]![SA-OPER]*[CRCTN]![CF-T-CO2]*[CRCTN]![CF-H-CO2]*[CRCTN]![CF-F-CO2]*[SEASON]![SEASONALITY] AS [CO2-Exhaust], [Table_Step3]![SumOfHC-HotSoak]*[SA]![SA-OPER]*[CRCTN]![CF-HS-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-HOTSOAK], [Table_Step3]![SumOfHC-DIURNAL]*[SA]![SA-STORAGE]*[CRCTN]![CF-DIU-GARAGE-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-DIURNAL], [Table_Step3]![SumOfHC-RESTING]*[SA]![SA-STORAGE]*[CRCTN]![CF-REST-GARAGE-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-RESTING], [Table_Step3]![SumOfHC-RL]*[SA]![SA-OPER]*[CRCTN]![CF-RL-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-RUNNINGLOSS], CDbl(0) AS [THC-TOTAL], CDbl(0) AS [TOG-EXH], CDbl(0) AS [TOG-EVAP], CDbl(0) AS [TOG-TOTAL], CDbl(0) AS [ROG-EXH], CDbl(0) AS [ROG-EVAP], CDbl(0) AS [ROG-TOTAL], CDbl(0) AS PM10, CDbl(0) AS PM25, CDbl(0) AS FUELCONSUMPTION_EXH, " & _

"CDbl(0) AS FUELCONSUMPTION_EVAP, CDbl(0) AS FUELCONSUMPTION_TOTAL, CDbl(0) AS NH3, [Table_Step3]![SumOfHC_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-T-HC]*[CRCTN]![CF-H-HC]*[CRCTN]![CF-F-HC]*[SEASON]![SEASONALITY] AS [HC-Exhaust_Scenario], [Table_Step3]![SumOfCO_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-T-CO]*[CRCTN]![CF-H-CO]*[CRCTN]![CF-F-CO]*[SEASON]![SEASONALITY] AS [CO-Exhaust_Scenario], [Table_Step3]![SumOfNOX_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-T-NOX]*[CRCTN]![CF-H-NOX]*[CRCTN]![CF-F-NOX]*[SEASON]![SEASONALITY] AS [NOX-Exhaust_Scenario], [Table_Step3]![SumOfPM_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-T-PM]*[CRCTN]![CF-H-PM]*[CRCTN]![CF-F-PM]*[SEASON]![SEASONALITY] AS [PM-Exhaust_Scenario], [Table_Step3]![SumOfSOX_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-T-SOX]*[CRCTN]![CF-H-SOX]*[CRCTN]![CF-F-SOX]*[SEASON]![SEASONALITY] AS [SOX-Exhaust_Scenario], " & _

"[Table_Step3]![SumOfCO2_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-T-CO2]*[CRCTN]![CF-H-CO2]*[CRCTN]![CF-F-CO2]*[SEASON]![SEASONALITY] AS [CO2-Exhaust_Scenario], [Table_Step3]![SumOfHC-HotSoak_Scenario]*[SA]![SA-

OPER]*[CRCTN]![CF-HS-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-HOTSOAK_Scenario], [Table_Step3]![SumOfHC-DIURNAL_Scenario]*[SA]![SA-STORAGE]*[CRCTN]![CF-DIU-GARAGE-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-DIURNAL_Scenario], [Table_Step3]![SumOfHC-RESTING_Scenario]*[SA]![SA-STORAGE]*[CRCTN]![CF-REST-GARAGE-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-RESTING_Scenario], [Table_Step3]![SumOfHC-RL_Scenario]*[SA]![SA-OPER]*[CRCTN]![CF-RL-HC]*[SEASON]![SEASONALITY] AS [HC-EVAP-RUNNINGLOSS_Scenario], CDbl(0) AS [THC-TOTAL_Scenario], " & _

"CDbl(0) AS [TOG-EXH_Scenario], CDbl(0) AS [TOG-EVAP_Scenario], CDbl(0) AS [TOG-TOTAL_Scenario], CDbl(0) AS [ROG-EXH_Scenario], CDbl(0) AS [ROG-EVAP_Scenario], CDbl(0) AS [ROG-TOTAL_Scenario], CDbl(0) AS PM10_Scenario, CDbl(0) AS PM25_Scenario, CDbl(0) AS FUELCONSUMPTION_EXH_Scenario, CDbl(0) AS FUELCONSUMPTION_EVAP_Scenario, CDbl(0) AS FUELCONSUMPTION_TOTAL_Scenario, CDbl(0) AS NH3_Scenario INTO Table_Step4 FROM (CRCTN INNER JOIN ((Table_Step3 INNER JOIN SA ON Table_Step3.CATEGORY = SA.CATEGORY) INNER JOIN GAI ON SA.GAI = GAI.GAI) ON (CRCTN.CY = Table_Step3.CY) AND (CRCTN.[STRK-FUEL-TECH] = Table_Step3.[STRK-FUEL-TECH]) AND (CRCTN.CATEGORY = Table_Step3.CATEGORY) AND (CRCTN.GAI = GAI.GAI)) INNER JOIN SEASON ON (Table_Step3.CATEGORY = SEASON.CATEGORY) AND (CRCTN.SEASON = SEASON.SEASON);"

'Step04a

'UPDATE Table_Step4

'population-running = 0; activity = 0 for inactive equipment

DoCmd.RunSQL "UPDATE Table_Step4 SET Table_Step4.[POP-Alloc] = 0, Table_Step4.[Act-Anl] = 0 WHERE (((Table_Step4.STATUS)=2));"

'Step04b

'UPDATE Table_Step4

'Apply weathering adjustment to Diurnal and Resting HC emissions

'HC_Process = HC_Process * WeatheringAdjustment

DoCmd.RunSQL "UPDATE Table_Step4 INNER JOIN Weathering ON (Weathering.STATUS = Table_Step4.STATUS) AND (Table_Step4.SEASON = Weathering.SEASON) SET Table_Step4.[HC-EVAP-DIURNAL] = [Table_Step4]![HC-EVAP-DIURNAL]*[Weathering]![WeatheringFactor], Table_Step4.[HC-EVAP-RESTING] = [Table_Step4]![HC-EVAP-RESTING]*[Weathering]![WeatheringFactor], Table_Step4.[HC-EVAP-DIURNAL_Scenario] = [Table_Step4]![HC-EVAP-DIURNAL_Scenario]*[Weathering]![WeatheringFactor], Table_Step4.[HC-EVAP-

```
RESTING_Scenario] = [Table_Step4]![HC-EVAP-
RESTING_Scenario]*[Weathering]![WeatheringFactor];"


'Red and Green Sticker Program adjustment

'Pollutant = Pollutant * G-R-Adjustment

'Because of the memory limitations of Microsoft Access, this one step multiplication

'must be accomplished over steps 05-10. Percentage adjustments must be calculated
instead

'of applying G-R-Adjustments directly

''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''


  'Step05_GR

  'INTO Table_Step8_ATV1 FROM Table_Step2

  'Select equipment subject to Red and Green Sticker Program

    'Active ATVs and OHMC that are 2-stroke engines

  'Select MY

  'Also, add Green-Red ID for model years that fall under adjustment 'R' (>=2003) and
'G' (<2003): "GR_Cutoff"

  DoCmd.RunSQL "SELECT Table_Step2.CATEGORY, Table_Step2.STATUS,
Table_Step2.CY, Table_Step2.MY, IIf([Table_Step2]![MY]>=2003,'R','G') AS
GR_Cutoff, Table_Step2.[STRK-FUEL-TECH], Table_Step2.HPGRP,
Table_Step2.[POP2], Table_Step2.[Act-Anl], Table_Step2.HC, Table_Step2.CO,
Table_Step2.NOX, Table_Step2.PM, Table_Step2.SOX, Table_Step2.CO2,
Table_Step2.[HC-HotSoak], Table_Step2.[HC-DIURNAL], Table_Step2.[HC-RESTING],
Table_Step2.[HC-RL], Table_Step2.HC_Scenario, Table_Step2.CO_Scenario,
Table_Step2.NOX_Scenario, Table_Step2.PM_Scenario, Table_Step2.SOX_Scenario,
Table_Step2.CO2_Scenario, Table_Step2.[HC-HotSoak_Scenario], Table_Step2.[HC-
DIURNAL_Scenario], Table_Step2.[HC-RESTING_Scenario], Table_Step2.[HC-
RL_Scenario] INTO Table_Step8_ATV1 FROM Table_Step2 WHERE
(((Table_Step2.CATEGORY)=1 Or (Table_Step2.CATEGORY)=4) AND
((Table_Step2.STATUS)=1) AND ((Table_Step2.[STRK-FUEL-TECH])=1 Or
(Table_Step2.[STRK-FUEL-TECH])=2));"


  'Step06_GR

  'INTO Table_Step8_ATV4 FROM Table_Step8_ATV1
```

'Sum Emissions without model year

'Group by "GR_Cutoff"

```
DoCmd.RunSQL "SELECT Table_Step8_ATV1.CATEGORY,
Table_Step8_ATV1.STATUS, Table_Step8_ATV1.CY, Table_Step8_ATV1.GR_Cutoff,
Table_Step8_ATV1.[STRK-FUEL-TECH], Table_Step8_ATV1.HPGRP,
Sum(Table_Step8_ATV1.[POP2]) AS [SumOfPOP2], Sum(Table_Step8_ATV1.[Act-
Anl]) AS [SumOfAct-Anl], Sum(Table_Step8_ATV1.HC) AS SumOfHC,
Sum(Table_Step8_ATV1.CO) AS SumOfCO, Sum(Table_Step8_ATV1.NOX) AS
SumOfNOX, Sum(Table_Step8_ATV1.PM) AS SumOfPM,
Sum(Table_Step8_ATV1.SOX) AS SumOfSOX, Sum(Table_Step8_ATV1.CO2) AS
SumOfCO2, Sum(Table_Step8_ATV1.[HC-HotSoak]) AS [SumOfHC-HotSoak],
Sum(Table_Step8_ATV1.[HC-DIURNAL]) AS [SumOfHC-DIURNAL],
Sum(Table_Step8_ATV1.[HC-RESTING]) AS [SumOfHC-RESTING],
Sum(Table_Step8_ATV1.[HC-RL]) AS [SumOfHC-RL],
Sum(Table_Step8_ATV1.HC_Scenario) AS SumOfHC_Scenario,
Sum(Table_Step8_ATV1.CO_Scenario) AS SumOfCO_Scenario,
Sum(Table_Step8_ATV1.NOX_Scenario) AS SumOfNOX_Scenario,
Sum(Table_Step8_ATV1.PM_Scenario) AS SumOfPM_Scenario,
Sum(Table_Step8_ATV1.SOX_Scenario) AS SumOfSOX_Scenario, " & _

"Sum(Table_Step8_ATV1.CO2_Scenario) As SumOfCO2_Scenario,
Sum(Table_Step8_ATV1.[HC-HotSoak_Scenario]) AS [SumOfHC-HotSoak_Scenario],
Sum(Table_Step8_ATV1.[HC-DIURNAL_Scenario]) AS [SumOfHC-
DIURNAL_Scenario], Sum(Table_Step8_ATV1.[HC-RESTING_Scenario]) AS
[SumOfHC-RESTING_Scenario], Sum(Table_Step8_ATV1.[HC-RL_Scenario]) AS
[SumOfHC-RL_Scenario] INTO Table_Step8_ATV4 FROM Table_Step8_ATV1
GROUP BY Table_Step8_ATV1.CATEGORY, Table_Step8_ATV1.STATUS,
Table_Step8_ATV1.CY, Table_Step8_ATV1.GR_Cutoff, Table_Step8_ATV1.[STRK-
FUEL-TECH], Table_Step8_ATV1.HPGRP;"
```

'Step07_GR

'INTO Table_Step8_ATV5 FROM Table_Step8_ATV1

'Sum without model year or "GR_Cutoff"

'Placeholders for adjustment %'s: Pollutant_G & Pollutant_R

```
DoCmd.RunSQL "SELECT Table_Step8_ATV1.CATEGORY,
Table_Step8_ATV1.STATUS, Table_Step8_ATV1.CY, Table_Step8_ATV1.[STRK-
FUEL-TECH], Table_Step8_ATV1.HPGRP, Sum(Table_Step8_ATV1.POP2) AS
SumOfPOP2, Sum(Table_Step8_ATV1.[Act-Anl]) AS [SumOfAct-Anl],
Sum(Table_Step8_ATV1.HC) AS SumOfHC, Sum(Table_Step8_ATV1.CO) AS
SumOfCO, Sum(Table_Step8_ATV1.NOX) AS SumOfNOX,
Sum(Table_Step8_ATV1.PM) AS SumOfPM, Sum(Table_Step8_ATV1.SOX) AS
SumOfSOX, Sum(Table_Step8_ATV1.CO2) AS SumOfCO2,
```

```
Sum(Table_Step8_ATV1.[HC-HotSoak]) AS [SumOfHC-HotSoak],
Sum(Table_Step8_ATV1.[HC-DIURNAL]) AS [SumOfHC-DIURNAL],
Sum(Table_Step8_ATV1.[HC-RESTING]) AS [SumOfHC-RESTING],
Sum(Table_Step8_ATV1.[HC-RL]) AS [SumOfHC-RL], CDbl(0) AS POP2_P, CDbl(0)
AS [Act-Anl_P], CDbl(0) AS HC_P, CDbl(0) AS CO_P, CDbl(0) AS NOX_P, CDbl(0) AS
PM_P, CDbl(0) AS SOX_P, CDbl(0) AS CO2_P, CDbl(0) AS [HC-HotSoak_P], CDbl(0)
AS [HC-DIURNAL_P], CDbl(0) AS [HC-RESTING_P], CDbl(0) AS [HC-RL_P], CDbl(0)
AS POP2_G, CDbl(0) AS [Act-Anl_G], " & _

   "CDbl(0) AS HC_G, CDbl(0) AS CO_G, CDbl(0) AS NOX_G, CDbl(0) AS PM_G,
CDbl(0) AS SOX_G, CDbl(0) AS CO2_G, CDbl(0) AS [HC-HotSoak_G], CDbl(0) AS
[HC-DIURNAL_G], CDbl(0) AS [HC-RESTING_G], CDbl(0) AS [HC-RL_G], CDbl(0) AS
Expr1, Sum(Table_Step8_ATV1.HC_Scenario) AS SumOfHC_Scenario,
Sum(Table_Step8_ATV1.CO_Scenario) AS SumOfCO_Scenario,
Sum(Table_Step8_ATV1.NOX_Scenario) AS SumOfNOX_Scenario,
Sum(Table_Step8_ATV1.PM_Scenario) AS SumOfPM_Scenario,
Sum(Table_Step8_ATV1.SOX_Scenario) AS SumOfSOX_Scenario,
Sum(Table_Step8_ATV1.CO2_Scenario) AS SumOfCO2_Scenario,
Sum(Table_Step8_ATV1.[HC-HotSoak_Scenario]) AS [SumOfHC-HotSoak_Scenario],
Sum(Table_Step8_ATV1.[HC-DIURNAL_Scenario]) AS [SumOfHC-
DIURNAL_Scenario], Sum(Table_Step8_ATV1.[HC-RESTING_Scenario]) AS
[SumOfHC-RESTING_Scenario], Sum(Table_Step8_ATV1.[HC-RL_Scenario]) AS
[SumOfHC-RL_Scenario], CDbl(0) AS HC_P_Scenario, CDbl(0) AS CO_P_Scenario,
CDbl(0) AS NOX_P_Scenario, CDbl(0) AS PM_P_Scenario, CDbl(0) AS
SOX_P_Scenario, " & _

   "CDbl(0) AS CO2_P_Scenario, CDbl(0) AS [HC-HotSoak_P_Scenario], CDbl(0) AS
[HC-DIURNAL_P_Scenario], CDbl(0) AS [HC-RESTING_P_Scenario], CDbl(0) AS [HC-
RL_P_Scenario], CDbl(0) AS HC_G_Scenario, CDbl(0) AS CO_G_Scenario, CDbl(0)
AS NOX_G_Scenario, CDbl(0) AS PM_G_Scenario, CDbl(0) AS SOX_G_Scenario,
CDbl(0) AS CO2_G_Scenario, CDbl(0) AS [HC-HotSoak_G_Scenario], CDbl(0) AS
[HC-DIURNAL_G_Scenario], CDbl(0) AS [HC-RESTING_G_Scenario], CDbl(0) AS
[HC-RL_G_Scenario] INTO Table_Step8_ATV5 FROM Table_Step8_ATV1 GROUP BY
Table_Step8_ATV1.CATEGORY, Table_Step8_ATV1.STATUS,
Table_Step8_ATV1.CY, Table_Step8_ATV1.[STRK-FUEL-TECH],
Table_Step8_ATV1.HPGRP, CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0),
CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0),
CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0), CDbl(0);"


   'Step08_GR

   'UPDATE Table_Step8_ATV5

   'Pollutant_G = Table_Step8_ATV4 / Table_Step8_ATV5

      'WHERE GR_Cutoff = 'G'
```

```
DoCmd.RunSQL "UPDATE Table_Step8_ATV5 INNER JOIN Table_Step8_ATV4
ON (Table_Step8_ATV5.HPGRP = Table_Step8_ATV4.HPGRP) AND
(Table_Step8_ATV5.[STRK-FUEL-TECH] = Table_Step8_ATV4.[STRK-FUEL-TECH])
AND (Table_Step8_ATV5.CY = Table_Step8_ATV4.CY) AND
(Table_Step8_ATV5.STATUS = Table_Step8_ATV4.STATUS) AND
(Table_Step8_ATV5.CATEGORY = Table_Step8_ATV4.CATEGORY) SET
Table_Step8_ATV5.[POP2_G] =
[Table_Step8_ATV4]![SumOfPOP2]/[Table_Step8_ATV5]![SumOfPOP2], " & _

"Table_Step8_ATV5.[Act-Anl_G] = [Table_Step8_ATV4]![SumOfAct-
Anl]/[Table_Step8_ATV5]![SumOfAct-Anl], Table_Step8_ATV5.HC_G =
[Table_Step8_ATV4]![SumOfHC]/[Table_Step8_ATV5]![SumOfHC],
Table_Step8_ATV5.CO_G =
[Table_Step8_ATV4]![SumOfCO]/[Table_Step8_ATV5]![SumOfCO],
Table_Step8_ATV5.NOX_G =
[Table_Step8_ATV4]![SumOfNOX]/[Table_Step8_ATV5]![SumOfNOX],
Table_Step8_ATV5.PM_G =
[Table_Step8_ATV4]![SumOfPM]/[Table_Step8_ATV5]![SumOfPM],
Table_Step8_ATV5.SOX_G =
[Table_Step8_ATV4]![SumOfSOX]/[Table_Step8_ATV5]![SumOfSOX],
Table_Step8_ATV5.CO2_G =
[Table_Step8_ATV4]![SumOfCO2]/[Table_Step8_ATV5]![SumOfCO2], " & _

"Table_Step8_ATV5.[HC-HotSoak_G] = [Table_Step8_ATV4]![SumOfHC-
HotSoak]/[Table_Step8_ATV5]![SumOfHC-HotSoak], Table_Step8_ATV5.[HC-
DIURNAL_G] = [Table_Step8_ATV4]![SumOfHC-
DIURNAL]/[Table_Step8_ATV5]![SumOfHC-DIURNAL], Table_Step8_ATV5.[HC-
RESTING_G] = [Table_Step8_ATV4]![SumOfHC-
RESTING]/[Table_Step8_ATV5]![SumOfHC-RESTING], Table_Step8_ATV5.[HC-RL_G]
= [Table_Step8_ATV4]![SumOfHC-RL]/[Table_Step8_ATV5]![SumOfHC-RL],
Table_Step8_ATV5.HC_G_Scenario =
[Table_Step8_ATV4]![SumOfHC_Scenario]/[Table_Step8_ATV5]![SumOfHC_Scenario],
Table_Step8_ATV5.CO_G_Scenario =
[Table_Step8_ATV4]![SumOfCO_Scenario]/[Table_Step8_ATV5]![SumOfCO_Scenario]
, Table_Step8_ATV5.NOX_G_Scenario =
[Table_Step8_ATV4]![SumOfNOX_Scenario]/[Table_Step8_ATV5]![SumOfNOX_Scena
rio], Table_Step8_ATV5.PM_G_Scenario =
[Table_Step8_ATV4]![SumOfPM_Scenario]/[Table_Step8_ATV5]![SumOfPM_Scenario]
, Table_Step8_ATV5.SOX_G_Scenario =
[Table_Step8_ATV4]![SumOfSOX_Scenario]/[Table_Step8_ATV5]![SumOfSOX_Scenar
io], " & _

"Table_Step8_ATV5.CO2_G_Scenario =
[Table_Step8_ATV4]![SumOfCO2_Scenario]/[Table_Step8_ATV5]![SumOfCO2_Scenar
io], Table_Step8_ATV5.[HC-HotSoak_G_Scenario] = [Table_Step8_ATV4]![SumOfHC-
HotSoak_Scenario]/[Table_Step8_ATV5]![SumOfHC-HotSoak_Scenario],
Table_Step8_ATV5.[HC-DIURNAL_G_Scenario] = [Table_Step8_ATV4]![SumOfHC-
DIURNAL_Scenario]/[Table_Step8_ATV5]![SumOfHC-DIURNAL_Scenario],
```

```
Table_Step8_ATV5.[HC-RESTING_G_Scenario] = [Table_Step8_ATV4]![SumOfHC-RESTING_Scenario]/[Table_Step8_ATV5]![SumOfHC-RESTING_Scenario], Table_Step8_ATV5.[HC-RL_G_Scenario] = [Table_Step8_ATV4]![SumOfHC-RL_Scenario]/[Table_Step8_ATV5]![SumOfHC-RL_Scenario] WHERE (((Table_Step8_ATV4.GR_Cutoff)='G'));"

   'Step08b_GR

   'UPDATE Table_Step8_ATV5

   'Pollutant_P = Table_Step8_ATV4 / Table_Step8_ATV5

      'WHERE GR_Cutoff = 'R'

   DoCmd.RunSQL "UPDATE Table_Step8_ATV5 INNER JOIN Table_Step8_ATV4 ON (Table_Step8_ATV5.HPGRP = Table_Step8_ATV4.HPGRP) AND (Table_Step8_ATV5.[STRK-FUEL-TECH] = Table_Step8_ATV4.[STRK-FUEL-TECH]) AND (Table_Step8_ATV5.CY = Table_Step8_ATV4.CY) AND (Table_Step8_ATV5.STATUS = Table_Step8_ATV4.STATUS) AND (Table_Step8_ATV5.CATEGORY = Table_Step8_ATV4.CATEGORY) SET Table_Step8_ATV5.[POP2_P] = [Table_Step8_ATV4]![SumOfPOP2]/[Table_Step8_ATV5]![SumOfPOP2], Table_Step8_ATV5.[Act-Anl_P] = [Table_Step8_ATV4]![SumOfAct-Anl]/[Table_Step8_ATV5]![SumOfAct-Anl], Table_Step8_ATV5.HC_P = [Table_Step8_ATV4]![SumOfHC]/[Table_Step8_ATV5]![SumOfHC], Table_Step8_ATV5.CO_P = [Table_Step8_ATV4]![SumOfCO]/[Table_Step8_ATV5]![SumOfCO], Table_Step8_ATV5.NOX_P = [Table_Step8_ATV4]![SumOfNOX]/[Table_Step8_ATV5]![SumOfNOX], Table_Step8_ATV5.PM_P = [Table_Step8_ATV4]![SumOfPM]/[Table_Step8_ATV5]![SumOfPM], Table_Step8_ATV5.SOX_P = [Table_Step8_ATV4]![SumOfSOX]/[Table_Step8_ATV5]![SumOfSOX], " & _

   "Table_Step8_ATV5.CO2_P = [Table_Step8_ATV4]![SumOfCO2]/[Table_Step8_ATV5]![SumOfCO2], Table_Step8_ATV5.[HC-HotSoak_P] = [Table_Step8_ATV4]![SumOfHC-HotSoak]/[Table_Step8_ATV5]![SumOfHC-HotSoak], Table_Step8_ATV5.[HC-DIURNAL_P] = [Table_Step8_ATV4]![SumOfHC-DIURNAL]/[Table_Step8_ATV5]![SumOfHC-DIURNAL], Table_Step8_ATV5.[HC-RESTING_P] = [Table_Step8_ATV4]![SumOfHC-RESTING]/[Table_Step8_ATV5]![SumOfHC-RESTING], Table_Step8_ATV5.[HC-RL_P] = [Table_Step8_ATV4]![SumOfHC-RL]/[Table_Step8_ATV5]![SumOfHC-RL], Table_Step8_ATV5.HC_P_Scenario = [Table_Step8_ATV4]![SumOfHC_Scenario]/[Table_Step8_ATV5]![SumOfHC_Scenario], Table_Step8_ATV5.CO_P_Scenario = [Table_Step8_ATV4]![SumOfCO_Scenario]/[Table_Step8_ATV5]![SumOfCO_Scenario], Table_Step8_ATV5.NOX_P_Scenario =
```

[Table_Step8_ATV4]![SumOfNOX_Scenario]/[Table_Step8_ATV5]![SumOfNOX_Scenario], Table_Step8_ATV5.PM_P_Scenario = [Table_Step8_ATV4]![SumOfPM_Scenario]/[Table_Step8_ATV5]![SumOfPM_Scenario], " & _

"Table_Step8_ATV5.SOX_P_Scenario = [Table_Step8_ATV4]![SumOfSOX_Scenario]/[Table_Step8_ATV5]![SumOfSOX_Scenario], Table_Step8_ATV5.CO2_P_Scenario = [Table_Step8_ATV4]![SumOfCO2_Scenario]/[Table_Step8_ATV5]![SumOfCO2_Scenario], Table_Step8_ATV5.[HC-HotSoak_P_Scenario] = [Table_Step8_ATV4]![SumOfHC-HotSoak_Scenario]/[Table_Step8_ATV5]![SumOfHC-HotSoak_Scenario], Table_Step8_ATV5.[HC-DIURNAL_P_Scenario] = [Table_Step8_ATV4]![SumOfHC-DIURNAL_Scenario]/[Table_Step8_ATV5]![SumOfHC-DIURNAL_Scenario], Table_Step8_ATV5.[HC-RESTING_P_Scenario] = [Table_Step8_ATV4]![SumOfHC-RESTING_Scenario]/[Table_Step8_ATV5]![SumOfHC-RESTING_Scenario], Table_Step8_ATV5.[HC-RL_P_Scenario] = [Table_Step8_ATV4]![SumOfHC-RL_Scenario]/[Table_Step8_ATV5]![SumOfHC-RL_Scenario] WHERE (((Table_Step8_ATV4.GR_Cutoff)='R'));"

'Step09_GR

'UPDATE Table_Step8_ATV5

'Set blank entries to 0 where null

DoCmd.RunSQL "UPDATE Table_Step8_ATV5 SET Table_Step8_ATV5.POP2_P = 0, Table_Step8_ATV5.[Act-Anl_P] = 0, Table_Step8_ATV5.HC_P = 0, Table_Step8_ATV5.CO_P = 0, Table_Step8_ATV5.NOX_P = 0, Table_Step8_ATV5.PM_P = 0, Table_Step8_ATV5.SOX_P = 0, Table_Step8_ATV5.CO2_P = 0, Table_Step8_ATV5.[HC-HotSoak_P] = 0, Table_Step8_ATV5.[HC-DIURNAL_P] = 0, Table_Step8_ATV5.[HC-RESTING_P] = 0, Table_Step8_ATV5.[HC-RL_P] = 0, Table_Step8_ATV5.POP2_G = 0, Table_Step8_ATV5.[Act-Anl_G] = 0, Table_Step8_ATV5.HC_G = 0, Table_Step8_ATV5.CO_G = 0, Table_Step8_ATV5.NOX_G = 0, Table_Step8_ATV5.PM_G = 0, Table_Step8_ATV5.SOX_G = 0, Table_Step8_ATV5.CO2_G = 0, Table_Step8_ATV5.[HC-HotSoak_G] = 0, Table_Step8_ATV5.[HC-DIURNAL_G] = 0, Table_Step8_ATV5.[HC-RESTING_G] = 0, Table_Step8_ATV5.[HC-RL_G] = 0, Table_Step8_ATV5.HC_P_Scenario = 0, Table_Step8_ATV5.CO_P_Scenario = 0, Table_Step8_ATV5.NOX_P_Scenario = 0, Table_Step8_ATV5.PM_P_Scenario = 0, " & _

"Table_Step8_ATV5.SOX_P_Scenario = 0, Table_Step8_ATV5.CO2_P_Scenario = 0, Table_Step8_ATV5.[HC-HotSoak_P_Scenario] = 0, Table_Step8_ATV5.[HC-DIURNAL_P_Scenario] = 0, Table_Step8_ATV5.[HC-RESTING_P_Scenario] = 0, Table_Step8_ATV5.[HC-RL_P_Scenario] = 0, Table_Step8_ATV5.HC_G_Scenario = 0, Table_Step8_ATV5.CO_G_Scenario = 0, Table_Step8_ATV5.NOX_G_Scenario = 0, Table_Step8_ATV5.PM_G_Scenario = 0, Table_Step8_ATV5.SOX_G_Scenario = 0, Table_Step8_ATV5.CO2_G_Scenario = 0, Table_Step8_ATV5.[HC-

HotSoak_G_Scenario] = 0, Table_Step8_ATV5.[HC-DIURNAL_G_Scenario] = 0, Table_Step8_ATV5.[HC-RESTING_G_Scenario] = 0, Table_Step8_ATV5.[HC-RL_G_Scenario] = 0 " & _

"WHERE (((Table_Step8_ATV5.POP2_P) Is Null) AND ((Table_Step8_ATV5.[Act-Anl_P]) Is Null) AND ((Table_Step8_ATV5.HC_P) Is Null) AND ((Table_Step8_ATV5.CO_P) Is Null) AND ((Table_Step8_ATV5.NOX_P) Is Null) AND ((Table_Step8_ATV5.PM_P) Is Null) AND ((Table_Step8_ATV5.SOX_P) Is Null) AND ((Table_Step8_ATV5.CO2_P) Is Null) AND ((Table_Step8_ATV5.[HC-HotSoak_P]) Is Null) AND ((Table_Step8_ATV5.[HC-DIURNAL_P]) Is Null) AND ((Table_Step8_ATV5.[HC-RESTING_P]) Is Null) AND ((Table_Step8_ATV5.[HC-RL_P]) Is Null) AND ((Table_Step8_ATV5.POP2_G) Is Null) AND ((Table_Step8_ATV5.[Act-Anl_G]) Is Null) AND ((Table_Step8_ATV5.HC_G) Is Null) AND ((Table_Step8_ATV5.CO_G) Is Null) AND ((Table_Step8_ATV5.NOX_G) Is Null) AND ((Table_Step8_ATV5.PM_G) Is Null) AND " & _

"((Table_Step8_ATV5.SOX_G) Is Null) AND ((Table_Step8_ATV5.CO2_G) Is Null) AND ((Table_Step8_ATV5.[HC-HotSoak_G]) Is Null) AND ((Table_Step8_ATV5.[HC-DIURNAL_G]) Is Null) AND ((Table_Step8_ATV5.[HC-RESTING_G]) Is Null) AND ((Table_Step8_ATV5.[HC-RL_G]) Is Null) AND ((Table_Step8_ATV5.HC_P_Scenario) Is Null) AND ((Table_Step8_ATV5.CO_P_Scenario) Is Null) AND ((Table_Step8_ATV5.NOX_P_Scenario) Is Null) AND ((Table_Step8_ATV5.PM_P_Scenario) Is Null) AND ((Table_Step8_ATV5.SOX_P_Scenario) Is Null) AND ((Table_Step8_ATV5.CO2_P_Scenario) Is Null) AND ((Table_Step8_ATV5.[HC-HotSoak_P_Scenario]) Is Null) AND " & _

"((Table_Step8_ATV5.[HC-DIURNAL_P_Scenario]) Is Null) AND ((Table_Step8_ATV5.[HC-RESTING_P_Scenario]) Is Null) AND ((Table_Step8_ATV5.[HC-RL_P_Scenario]) Is Null) AND ((Table_Step8_ATV5.HC_G_Scenario) Is Null) AND ((Table_Step8_ATV5.CO_G_Scenario) Is Null) AND ((Table_Step8_ATV5.NOX_G_Scenario) Is Null) AND ((Table_Step8_ATV5.PM_G_Scenario) Is Null) AND ((Table_Step8_ATV5.SOX_G_Scenario) Is Null) AND ((Table_Step8_ATV5.CO2_G_Scenario) Is Null) AND ((Table_Step8_ATV5.[HC-HotSoak_G_Scenario]) Is Null) AND ((Table_Step8_ATV5.[HC-DIURNAL_G_Scenario]) Is Null) AND ((Table_Step8_ATV5.[HC-RESTING_G_Scenario]) Is Null) AND ((Table_Step8_ATV5.[HC-RL_G_Scenario]) Is Null));"

'Step10_GR

'UPDATE Table_Step4

'Apply Composite GR-Adjustment to GAI emissions, GAI that do not get adjustment have composite = 1

'Pollutant = Pollutant * [Pre2003Percent + (Post2002Percent * GR_CorrectionFactor)]

```
DoCmd.RunSQL "UPDATE (Table_Step4 INNER JOIN Table_Step8_ATV5 ON (Table_Step4.HPGRP = Table_Step8_ATV5.HPGRP) AND (Table_Step4.[STRK-FUEL-TECH] = Table_Step8_ATV5.[STRK-FUEL-TECH]) AND (Table_Step4.CY = Table_Step8_ATV5.CY) AND (Table_Step4.STATUS = Table_Step8_ATV5.STATUS) AND (Table_Step4.CATEGORY = Table_Step8_ATV5.CATEGORY)) INNER JOIN GreenRed_Check ON (Table_Step4.SEASON = GreenRed_Check.SEASON) AND (Table_Step4.GAI = GreenRed_Check.GAI) SET Table_Step4.GR_ID = IIf([GreenRed_Check]![CorrectionR]=0.795,2,IIf([GreenRed_Check]![CorrectionR]=0.59,3,[Table_Step4]![GR_ID])), Table_Step4.[POP-Alloc] = [Table_Step4]![POP-Alloc]*([Table_Step8_ATV5]![POP2_G]+([Table_Step8_ATV5]![POP2_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[Act-Anl] = [Table_Step4]![Act-Anl]*([Table_Step8_ATV5]![Act-Anl_G]+([Table_Step8_ATV5]![Act-Anl_P]*[GreenRed_Check]![CorrectionR])), " & _

"Table_Step4.[HC-Exhaust] = [Table_Step4]![HC-Exhaust]*([Table_Step8_ATV5]![HC_G]+([Table_Step8_ATV5]![HC_P]*[GreenRed_Check]![CorrectionR])), " & _

"Table_Step4.[CO-Exhaust] = [Table_Step4]![CO-Exhaust]*([Table_Step8_ATV5]![CO_G]+([Table_Step8_ATV5]![CO_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[NOX-Exhaust] = [Table_Step4]![NOX-Exhaust]*([Table_Step8_ATV5]![NOX_G]+([Table_Step8_ATV5]![NOX_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[PM-Exhaust] = [Table_Step4]![PM-Exhaust]*([Table_Step8_ATV5]![PM_G]+([Table_Step8_ATV5]![PM_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[SOX-Exhaust] = [Table_Step4]![SOX-Exhaust]*([Table_Step8_ATV5]![SOX_G]+([Table_Step8_ATV5]![SOX_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[CO2-Exhaust] = [Table_Step4]![CO2-Exhaust]*([Table_Step8_ATV5]![CO2_G]+([Table_Step8_ATV5]![CO2_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[HC-EVAP-HOTSOAK] = [Table_Step4]![HC-EVAP-HOTSOAK]*([Table_Step8_ATV5]![HC-HotSoak_G]+([Table_Step8_ATV5]![HC-HotSoak_P]*[GreenRed_Check]![CorrectionR])), " & _

"Table_Step4.[HC-EVAP-RUNNINGLOSS] = [Table_Step4]![HC-EVAP-RUNNINGLOSS]*([Table_Step8_ATV5]![HC-RL_G]+([Table_Step8_ATV5]![HC-RL_P]*[GreenRed_Check]![CorrectionR])), Table_Step4.[HC-Exhaust_Scenario] = [Table_Step4]![HC-Exhaust_Scenario]*([Table_Step8_ATV5]![HC_G_Scenario]+([Table_Step8_ATV5]![HC_P_Scenario]*[GreenRed_Check]![CorrectionR])), Table_Step4.[CO-Exhaust_Scenario] = [Table_Step4]![CO-Exhaust_Scenario]*([Table_Step8_ATV5]![CO_G_Scenario]+([Table_Step8_ATV5]![CO_P_Scenario]*[GreenRed_Check]![CorrectionR])), Table_Step4.[NOX-Exhaust_Scenario] = [Table_Step4]![NOX-Exhaust_Scenario]*([Table_Step8_ATV5]![NOX_G_Scenario]+([Table_Step8_ATV5]![NOX_P_Scenario]*[GreenRed_Check]![CorrectionR])), Table_Step4.[PM-Exhaust_Scenario] = [Table_Step4]![PM-
```

Exhaust_Scenario]*([Table_Step8_ATV5]![PM_G_Scenario]+([Table_Step8_ATV5]![PM_P_Scenario]*[GreenRed_Check]![CorrectionR])), " & _

"Table_Step4.[SOX-Exhaust_Scenario] = [Table_Step4]![SOX-Exhaust_Scenario]*([Table_Step8_ATV5]![SOX_G_Scenario]+([Table_Step8_ATV5]![SOX_P_Scenario]*[GreenRed_Check]![CorrectionR])), Table_Step4.[CO2-Exhaust_Scenario] = [Table_Step4]![CO2-Exhaust_Scenario]*([Table_Step8_ATV5]![CO2_G_Scenario]+([Table_Step8_ATV5]![CO2_P_Scenario]*[GreenRed_Check]![CorrectionR])), Table_Step4.[HC-EVAP-HOTSOAK_Scenario] = [Table_Step4]![HC-EVAP-HOTSOAK_Scenario]*([Table_Step8_ATV5]![HC-HotSoak_G_Scenario]+([Table_Step8_ATV5]![HC-HotSoak_P_Scenario]*[GreenRed_Check]![CorrectionR])), Table_Step4.[HC-EVAP-RUNNINGLOSS_Scenario] = [Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario]*([Table_Step8_ATV5]![HC-RL_G_Scenario]+([Table_Step8_ATV5]![HC-RL_P_Scenario]*[GreenRed_Check]![CorrectionR]));"

'Model Year Percentages

'The model year distribution of emissions is calculated as percentages so that the user interface can recalculate

'emissions by model year on the fly. The percentages are needed because the inventory does not fit in Access at the

'model year level. After these percentages are calculated the Red and Green Sticker Program adjustment needs to be applied

''

'Step11_MY

'INTO Table_Stepm_3

'Divide emissions by model year by the table with emissions without to get emissions percentage distributions

'Percentage = Table_Step2/Table_Step3

DoCmd.RunSQL "SELECT CInt(1) AS GR_ID, Table_Step2.CATEGORY, Table_Step2.STATUS, Table_Step2.CY, Table_Step2.MY, Table_Step2.AGE, Table_Step2.[STRK-FUEL-TECH], Table_Step2.HPGRP, [Table_Step2]![POP2]/[Table_Step3]![SumOfPOP2] AS POP2, [Table_Step2]![Act-Anl]/[Table_Step3]![SumOfAct-Anl] AS [Act-Anl],

```
[Table_Step2]![HC]/[Table_Step3]![SumOfHC] AS HC,
[Table_Step2]![CO]/[Table_Step3]![SumOfCO] AS CO,
[Table_Step2]![NOX]/[Table_Step3]![SumOfNOX] AS NOX,
[Table_Step2]![PM]/[Table_Step3]![SumOfPM] AS PM,
[Table_Step2]![SOX]/[Table_Step3]![SumOfSOX] AS SOX,
[Table_Step2]![CO2]/[Table_Step3]![SumOfCO2] AS CO2, [Table_Step2]![HC-HotSoak]/[Table_Step3]![SumOfHC-HotSoak] AS [HC-HotSoak], [Table_Step2]![HC-DIURNAL]/[Table_Step3]![SumOfHC-DIURNAL] AS [HC-DIURNAL],
[Table_Step2]![HC-RESTING]/[Table_Step3]![SumOfHC-RESTING] AS [HC-RESTING],
[Table_Step2]![HC-RL]/[Table_Step3]![SumOfHC-RL] AS [HC-RL],
[Table_Step2]![HC_Scenario]/[Table_Step3]![SumOfHC_Scenario] AS HC_Scenario, " & _

   "[Table_Step2]![CO_Scenario]/[Table_Step3]![SumOfCO_Scenario] AS CO_Scenario, [Table_Step2]![NOX_Scenario]/[Table_Step3]![SumOfNOX_Scenario] AS NOX_Scenario, [Table_Step2]![PM_Scenario]/[Table_Step3]![SumOfPM_Scenario] AS PM_Scenario, [Table_Step2]![SOX_Scenario]/[Table_Step3]![SumOfSOX_Scenario] AS SOX_Scenario,
[Table_Step2]![CO2_Scenario]/[Table_Step3]![SumOfCO2_Scenario] AS CO2_Scenario, [Table_Step2]![HC-HotSoak_Scenario]/[Table_Step3]![SumOfHC-HotSoak_Scenario] AS [HC-HotSoak_Scenario], [Table_Step2]![HC-DIURNAL_Scenario]/[Table_Step3]![SumOfHC-DIURNAL_Scenario] AS [HC-DIURNAL_Scenario], [Table_Step2]![HC-RESTING_Scenario]/[Table_Step3]![SumOfHC-RESTING_Scenario] AS [HC-RESTING_Scenario], [Table_Step2]![HC-RL_Scenario]/[Table_Step3]![SumOfHC-RL_Scenario] AS [HC-RL_Scenario] INTO Table_Stepm_3 " & _

   "FROM Table_Step2 INNER JOIN Table_Step3 ON (Table_Step3.HPGRP = Table_Step2.HPGRP) AND (Table_Step2.[STRK-FUEL-TECH] = Table_Step3.[STRK-FUEL-TECH]) AND (Table_Step2.CY = Table_Step3.CY) AND (Table_Step2.STATUS = Table_Step3.STATUS) AND (Table_Step2.CATEGORY = Table_Step3.CATEGORY);"


   'Step12_MY

   'UPDATE Table_Stepm_3

   'Set nulls = 0 for functionality

   DoCmd.RunSQL "UPDATE Table_Stepm_3 SET Table_Stepm_3.[HC-HotSoak] = 0 WHERE (((Table_Stepm_3.[HC-HotSoak]) Is Null));"

   DoCmd.RunSQL "UPDATE Table_Stepm_3 SET Table_Stepm_3.[HC-RL] = 0 WHERE (((Table_Stepm_3.[HC-RL]) Is Null));"


   DoCmd.RunSQL "UPDATE Table_Stepm_3 SET Table_Stepm_3.[HC-HotSoak_Scenario] = 0 WHERE (((Table_Stepm_3.[HC-HotSoak_Scenario]) Is Null));"
```

DoCmd.RunSQL "UPDATE Table_Stepm_3 SET Table_Stepm_3.[HC-RL_Scenario] = 0 WHERE (((Table_Stepm_3.[HC-RL_Scenario]) Is Null));"

'Model Year Percentages: Red and Green Sticker Program

'Grab the subset of equipment which falls under the G-R sticker program

'"GR_ID" will identify equipment by season. "GR_ID" = 2 is Annual, "GR_ID" = 3 is summer, winter does not get adjusted

''

'Step13_MY

'INTO Table_Stepm_4

'Grab a duplicate for annual emissions, GR_ID = 2

'WHERE 2-stroke, ATV & OHMC, Active

DoCmd.RunSQL "SELECT 2 AS GR_ID, Table_Stepm_3.CATEGORY, Table_Stepm_3.STATUS, Table_Stepm_3.CY, Table_Stepm_3.MY, Table_Stepm_3.AGE, Table_Stepm_3.[STRK-FUEL-TECH], Table_Stepm_3.HPGRP, Table_Stepm_3.POP2, Table_Stepm_3.[Act-Anl], Table_Stepm_3.HC, Table_Stepm_3.CO, Table_Stepm_3.NOX, Table_Stepm_3.PM, Table_Stepm_3.SOX, Table_Stepm_3.CO2, Table_Stepm_3.[HC-HotSoak], Table_Stepm_3.[HC-DIURNAL], Table_Stepm_3.[HC-RESTING], Table_Stepm_3.[HC-RL], Table_Stepm_3.HC_Scenario, Table_Stepm_3.CO_Scenario, Table_Stepm_3.NOX_Scenario, Table_Stepm_3.PM_Scenario, Table_Stepm_3.SOX_Scenario, Table_Stepm_3.CO2_Scenario, Table_Stepm_3.[HC-HotSoak_Scenario], Table_Stepm_3.[HC-DIURNAL_Scenario], Table_Stepm_3.[HC-RESTING_Scenario], Table_Stepm_3.[HC-RL_Scenario] INTO Table_Stepm_4 FROM Table_Stepm_3 WHERE (((Table_Stepm_3.CATEGORY)=1 Or (Table_Stepm_3.CATEGORY)=4) AND ((Table_Stepm_3.STATUS)=1) AND ((Table_Stepm_3.[STRK-FUEL-TECH])=1 Or (Table_Stepm_3.[STRK-FUEL-TECH])=2));"

'Step14_MY

'APPEND Table_Stepm_4

'Grab a duplicate for summer emissions, GR_ID = 3

'WHERE 2-stroke, ATV & OHMC, Active

DoCmd.RunSQL "INSERT INTO Table_Stepm_4 (GR_ID, CATEGORY, STATUS, CY, MY, AGE, [STRK-FUEL-TECH], HPGRP, POP2, [Act-Anl], HC, CO, NOX, PM, SOX, CO2, [HC-HotSoak], [HC-DIURNAL], [HC-RESTING], [HC-RL], HC_Scenario, CO_Scenario, NOX_Scenario, PM_Scenario, SOX_Scenario, CO2_Scenario, [HC-HotSoak_Scenario], [HC-DIURNAL_Scenario], [HC-RESTING_Scenario], [HC-RL_Scenario]) " & _

"SELECT 3 AS GR_ID, Table_Stepm_3.CATEGORY, Table_Stepm_3.STATUS, Table_Stepm_3.CY, Table_Stepm_3.MY, Table_Stepm_3.AGE, Table_Stepm_3.[STRK-FUEL-TECH], Table_Stepm_3.HPGRP, Table_Stepm_3.POP2, Table_Stepm_3.[Act-Anl], Table_Stepm_3.HC, Table_Stepm_3.CO, Table_Stepm_3.NOX, Table_Stepm_3.PM, Table_Stepm_3.SOX, Table_Stepm_3.CO2, Table_Stepm_3.[HC-HotSoak], Table_Stepm_3.[HC-DIURNAL], Table_Stepm_3.[HC-RESTING], Table_Stepm_3.[HC-RL], Table_Stepm_3.HC_Scenario, Table_Stepm_3.CO_Scenario, Table_Stepm_3.NOX_Scenario, Table_Stepm_3.PM_Scenario, Table_Stepm_3.SOX_Scenario, Table_Stepm_3.CO2_Scenario, Table_Stepm_3.[HC-HotSoak_Scenario], Table_Stepm_3.[HC-DIURNAL_Scenario], Table_Stepm_3.[HC-RESTING_Scenario], Table_Stepm_3.[HC-RL_Scenario] FROM Table_Stepm_3 WHERE (((Table_Stepm_3.CATEGORY)=1 Or (Table_Stepm_3.CATEGORY)=4) AND ((Table_Stepm_3.STATUS)=1) AND ((Table_Stepm_3.[STRK-FUEL-TECH])=1 Or (Table_Stepm_3.[STRK-FUEL-TECH])=2));"

'Step15_MY

'UPDATE Table_Stepm_4

'Annual Red and Green Sticker adjustment to GAI emissions

'Pollutant = Pollutant * 0.735

DoCmd.RunSQL "UPDATE Table_Stepm_4 SET Table_Stepm_4.[POP2] = [Table_Stepm_4]![POP2]*0.735, Table_Stepm_4.[Act-Anl] = [Table_Stepm_4]![Act-Anl]*0.735, Table_Stepm_4.HC = [Table_Stepm_4]![HC]*0.735, Table_Stepm_4.CO = [Table_Stepm_4]![CO]*0.735, Table_Stepm_4.NOX = [Table_Stepm_4]![NOX]*0.735, Table_Stepm_4.PM = [Table_Stepm_4]![PM]*0.735, Table_Stepm_4.SOX = [Table_Stepm_4]![SOX]*0.735, Table_Stepm_4.CO2 = [Table_Stepm_4]![CO2]*0.735, Table_Stepm_4.[HC-HotSoak] = [Table_Stepm_4]![HC-HotSoak]*0.735, Table_Stepm_4.[HC-RL] = [Table_Stepm_4]![HC-RL]*0.735, Table_Stepm_4.HC_Scenario = [Table_Stepm_4]![HC_Scenario]*0.735, Table_Stepm_4.CO_Scenario = [Table_Stepm_4]![CO_Scenario]*0.735, Table_Stepm_4.NOX_Scenario = [Table_Stepm_4]![NOX_Scenario]*0.735, Table_Stepm_4.PM_Scenario = [Table_Stepm_4]![PM_Scenario]*0.735, Table_Stepm_4.SOX_Scenario = [Table_Stepm_4]![SOX_Scenario]*0.735, " & _

"Table_Stepm_4.CO2_Scenario = [Table_Stepm_4]![CO2_Scenario]*0.735, Table_Stepm_4.[HC-HotSoak_Scenario] = [Table_Stepm_4]![HC-HotSoak_Scenario]*0.735, Table_Stepm_4.[HC-RL_Scenario] = [Table_Stepm_4]![HC-

RL_Scenario]*0.735 WHERE (((Table_Stepm_4.GR_ID)=2) AND ((Table_Stepm_4.MY)>=2003));"

'Step16_MY

'UPDATE Table_Stepm_4

'Summer Red and Green Sticker Program adjustment to GAI emissions

'Pollutant = Pollutant * 0.47

DoCmd.RunSQL "UPDATE Table_Stepm_4 SET Table_Stepm_4.[POP2] = [Table_Stepm_4]![POP2]*0.47, Table_Stepm_4.[Act-Anl] = [Table_Stepm_4]![Act-Anl]*0.47, Table_Stepm_4.HC = [Table_Stepm_4]![HC]*0.47, Table_Stepm_4.CO = [Table_Stepm_4]![CO]*0.47, Table_Stepm_4.NOX = [Table_Stepm_4]![NOX]*0.47, Table_Stepm_4.PM = [Table_Stepm_4]![PM]*0.47, Table_Stepm_4.SOX = [Table_Stepm_4]![SOX]*0.47, Table_Stepm_4.CO2 = [Table_Stepm_4]![CO2]*0.47, Table_Stepm_4.[HC-HotSoak] = [Table_Stepm_4]![HC-HotSoak]*0.47, Table_Stepm_4.[HC-RL] = [Table_Stepm_4]![HC-RL]*0.47, Table_Stepm_4.HC_Scenario = [Table_Stepm_4]![HC_Scenario]*0.47, Table_Stepm_4.CO_Scenario = [Table_Stepm_4]![CO_Scenario]*0.47, Table_Stepm_4.NOX_Scenario = [Table_Stepm_4]![NOX_Scenario]*0.47, Table_Stepm_4.PM_Scenario = [Table_Stepm_4]![PM_Scenario]*0.47, Table_Stepm_4.SOX_Scenario = [Table_Stepm_4]![SOX_Scenario]*0.47, Table_Stepm_4.CO2_Scenario = [Table_Stepm_4]![CO2_Scenario]*0.47, " & _

"Table_Stepm_4.[HC-HotSoak_Scenario] = [Table_Stepm_4]![HC-HotSoak_Scenario]*0.47, Table_Stepm_4.[HC-RL_Scenario] = [Table_Stepm_4]![HC-RL_Scenario] * 0.47 WHERE (((Table_Stepm_4.GR_ID)=3) AND ((Table_Stepm_4.MY)>=2003));"

'Step17_MY

'INTO Table_Stepm_5 FROM Table_Stepm_4

'Sum emissions without model year for totals. Totals will generate model year percentages

DoCmd.RunSQL "SELECT Table_Stepm_4.GR_ID, Table_Stepm_4.CATEGORY, Table_Stepm_4.STATUS, Table_Stepm_4.CY, Table_Stepm_4.[STRK-FUEL-TECH], Table_Stepm_4.HPGRP, Sum(Table_Stepm_4.POP2) AS SumOfPOP2, Sum(Table_Stepm_4.[Act-Anl]) AS [SumOfAct-Anl], Sum(Table_Stepm_4.HC) AS SumOfHC, Sum(Table_Stepm_4.CO) AS SumOfCO, Sum(Table_Stepm_4.NOX) AS SumOfNOX, Sum(Table_Stepm_4.PM) AS SumOfPM, Sum(Table_Stepm_4.SOX) AS SumOfSOX, Sum(Table_Stepm_4.CO2) AS SumOfCO2, Sum(Table_Stepm_4.[HC-HotSoak]) AS [SumOfHC-HotSoak], Sum(Table_Stepm_4.[HC-DIURNAL]) AS [SumOfHC-DIURNAL], Sum(Table_Stepm_4.[HC-RESTING]) AS [SumOfHC-RESTING], Sum(Table_Stepm_4.[HC-RL]) AS [SumOfHC-RL], Sum(Table_Stepm_4.HC_Scenario) AS SumOfHC_Scenario, Sum(Table_Stepm_4.CO_Scenario) AS SumOfCO_Scenario, Sum(Table_Stepm_4.NOX_Scenario) AS SumOfNOX_Scenario, Sum(Table_Stepm_4.PM_Scenario) AS SumOfPM_Scenario, Sum(Table_Stepm_4.SOX_Scenario) AS SumOfSOX_Scenario, Sum(Table_Stepm_4.CO2_Scenario) AS SumOfCO2_Scenario, " & _

"Sum(Table_Stepm_4.[HC-HotSoak_Scenario]) AS [SumOfHC-HotSoak_Scenario], Sum(Table_Stepm_4.[HC-DIURNAL_Scenario]) AS [SumOfHC-DIURNAL_Scenario], Sum(Table_Stepm_4.[HC-RESTING_Scenario]) AS [SumOfHC-RESTING_Scenario], Sum(Table_Stepm_4.[HC-RL_Scenario]) AS [SumOfHC-RL_Scenario] INTO Table_Stepm_5 FROM Table_Stepm_4 GROUP BY Table_Stepm_4.GR_ID, Table_Stepm_4.CATEGORY, Table_Stepm_4.STATUS, Table_Stepm_4.CY, Table_Stepm_4.[STRK-FUEL-TECH], Table_Stepm_4.HPGRP HAVING (((Table_Stepm_4.CATEGORY)=1 Or (Table_Stepm_4.CATEGORY)=4) AND ((Table_Stepm_4.STATUS)=1) AND ((Table_Stepm_4.[STRK-FUEL-TECH])=1 Or (Table_Stepm_4.[STRK-FUEL-TECH])=2));"

'Step18_MY

'UPDATE Table_Stepm_4

'Divide model year emissions by total for percentages

'Pollutant = Table_Stepm_4 / Table_Stepm_5

DoCmd.RunSQL "UPDATE Table_Stepm_4 INNER JOIN Table_Stepm_5 ON (Table_Stepm_4.HPGRP = Table_Stepm_5.HPGRP) AND (Table_Stepm_4.[STRK-FUEL-TECH] = Table_Stepm_5.[STRK-FUEL-TECH]) AND (Table_Stepm_5.CY = Table_Stepm_4.CY) AND (Table_Stepm_4.STATUS = Table_Stepm_5.STATUS) AND (Table_Stepm_4.CATEGORY = Table_Stepm_5.CATEGORY) AND (Table_Stepm_4.GR_ID = Table_Stepm_5.GR_ID) SET Table_Stepm_4.[POP2] = [Table_Stepm_4]![POP2]/[Table_Stepm_5]![SumOfPOP2], Table_Stepm_4.[Act-Anl] = [Table_Stepm_4]![Act-Anl]/[Table_Stepm_5]![SumOfAct-Anl], Table_Stepm_4.HC = [Table_Stepm_4]![HC]/[Table_Stepm_5]![SumOfHC], Table_Stepm_4.CO = [Table_Stepm_4]![CO]/[Table_Stepm_5]![SumOfCO], Table_Stepm_4.NOX = [Table_Stepm_4]![NOX]/[Table_Stepm_5]![SumOfNOX], Table_Stepm_4.PM = [Table_Stepm_4]![PM]/[Table_Stepm_5]![SumOfPM], Table_Stepm_4.SOX = [Table_Stepm_4]![SOX]/[Table_Stepm_5]![SumOfSOX], Table_Stepm_4.CO2 = [Table_Stepm_4]![CO2]/[Table_Stepm_5]![SumOfCO2], " & _

"Table_Stepm_4.[HC-HotSoak] = [Table_Stepm_4]![HC-HotSoak]/[Table_Stepm_5]![SumOfHC-HotSoak], Table_Stepm_4.[HC-RL] = [Table_Stepm_4]![HC-RL]/[Table_Stepm_5]![SumOfHC-RL], Table_Stepm_4.HC_Scenario = [Table_Stepm_4]![HC_Scenario]/[Table_Stepm_5]![SumOfHC_Scenario], Table_Stepm_4.CO_Scenario = [Table_Stepm_4]![CO_Scenario]/[Table_Stepm_5]![SumOfCO_Scenario], Table_Stepm_4.NOX_Scenario = [Table_Stepm_4]![NOX_Scenario]/[Table_Stepm_5]![SumOfNOX_Scenario], Table_Stepm_4.PM_Scenario = [Table_Stepm_4]![PM_Scenario]/[Table_Stepm_5]![SumOfPM_Scenario], Table_Stepm_4.SOX_Scenario = [Table_Stepm_4]![SOX_Scenario]/[Table_Stepm_5]![SumOfSOX_Scenario], Table_Stepm_4.CO2_Scenario = [Table_Stepm_4]![CO2_Scenario]/[Table_Stepm_5]![SumOfCO2_Scenario], Table_Stepm_4.[HC-HotSoak_Scenario] = [Table_Stepm_4]![HC-HotSoak_Scenario]/[Table_Stepm_5]![SumOfHC-HotSoak_Scenario], Table_Stepm_4.[HC-RL_Scenario] = [Table_Stepm_4]![HC-RL_Scenario]/[Table_Stepm_5]![SumOfHC-RL_Scenario];"

'Step19_MY

'APPEND Table_Stepm_3

'Append the G-R sticker distributions to the model year percentages table

'GR_ID will identify which VehicleType-Season combination get appropriate adjustment factors

DoCmd.RunSQL "INSERT INTO Table_Stepm_3 SELECT Table_Stepm_4.* FROM Table_Stepm_4;"

'Additional Pollutants

'The following calculates pollutants that are derived from others. For example, ROG is calculated from HC

'using a conversion factor, PM2.5 is calculated from PM using a conversion factor.

''

'Step20

'UPDATE Table_Step4

'Pollutant that are calculated from others

'EX: PollutantB = PollutantA * C

DoCmd.RunSQL "UPDATE Table_Step4 INNER JOIN FRACTIONS ON (Table_Step4.CY = FRACTIONS.CY) AND (Table_Step4.[STRK-FUEL-TECH] = FRACTIONS.[STRK-FUEL-TECH]) AND (Table_Step4.CATEGORY = FRACTIONS.CATEGORY) SET Table_Step4.[THC-TOTAL] = [Table_Step4]![HC-Exhaust]+[Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-

RUNNINGLOSS], Table_Step4.[TOG-EXH] = [Table_Step4]![HC-Exhaust]*[FRACTIONS]![FR-TOG], Table_Step4.[TOG-EVAP] = ([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.[TOG-TOTAL] = ([Table_Step4]![HC-Exhaust])*[FRACTIONS]![FR-TOG]+([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.[ROG-EXH] = [Table_Step4]![HC-Exhaust]*[FRACTIONS]![FR-ROG], " & _

"Table_Step4.[ROG-EVAP] = ([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.[ROG-TOTAL] = ([Table_Step4]![HC-Exhaust])*[FRACTIONS]![FR-ROG]+([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.PM10 = [Table_Step4]![PM-Exhaust]*[FRACTIONS]![FR-PM10], Table_Step4.PM25 = [Table_Step4]![PM-Exhaust]*[FRACTIONS]![FR-PM25], Table_Step4.FUELCONSUMPTION_EXH = ((12.011/(12.011+0.54*1.008))*([Table_Step4]![HC-Exhaust]*[FRACTIONS]![FR-TOG])+(0.429)*[Table_Step4]![CO-Exhaust]+(0.273)*[Table_Step4]![CO2-Exhaust])*2000/(0.854*6.17), Table_Step4.FUELCONSUMPTION_EVAP = ([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP]*2000/6.17, " & _

"Table_Step4.FUELCONSUMPTION_TOTAL = ((12.011/(12.011+0.54*1.008))*([Table_Step4]![HC-Exhaust]*[FRACTIONS]![FR-TOG])+(0.429)*[Table_Step4]![CO-Exhaust]+(0.273)*[Table_Step4]![CO2-Exhaust])*2000/(0.854*6.17)+(([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP])*2000/6.17, Table_Step4.NH3 = (((12.011/(12.011+0.54*1.008))*([Table_Step4]![HC-Exhaust]*[FRACTIONS]![FR-TOG])+(0.429)*[Table_Step4]![CO-Exhaust]+(0.273)*[Table_Step4]![CO2-Exhaust])*2000/(0.854*6.17)+(([Table_Step4]![HC-EVAP-HOTSOAK]+[Table_Step4]![HC-EVAP-DIURNAL]+[Table_Step4]![HC-EVAP-RESTING]+[Table_Step4]![HC-EVAP-RUNNINGLOSS])*[FRACTIONS]![FR-ROG-EVAP])*2000/6.17)*116/1000/454/2000, Table_Step4.[THC-TOTAL_Scenario] = [Table_Step4]![HC-Exhaust_Scenario]+[Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario], " & _

"Table_Step4.[TOG-EXH_Scenario] = [Table_Step4]![HC-Exhaust_Scenario]*[FRACTIONS]![FR-TOG], Table_Step4.[TOG-EVAP_Scenario] = ([Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-

DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.[TOG-TOTAL_Scenario] = ([Table_Step4]![HC-Exhaust_Scenario])*[FRACTIONS]![FR-TOG]+([Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.[ROG-EXH_Scenario] = [Table_Step4]![HC-Exhaust_Scenario]*[FRACTIONS]![FR-ROG], Table_Step4.[ROG-EVAP_Scenario] = ([Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-EVAP], " & _

"Table_Step4.[ROG-TOTAL_Scenario] = ([Table_Step4]![HC-Exhaust_Scenario])*[FRACTIONS]![FR-ROG]+([Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-EVAP], Table_Step4.PM10_Scenario = [Table_Step4]![PM-Exhaust_Scenario]*[FRACTIONS]![FR-PM10], Table_Step4.PM25_Scenario = [Table_Step4]![PM-Exhaust_Scenario]*[FRACTIONS]![FR-PM25], Table_Step4.FUELCONSUMPTION_EXH_Scenario = ((12.011/(12.011+0.54*1.008))*([Table_Step4]![HC-Exhaust_Scenario]*[FRACTIONS]![FR-TOG])+(0.429)*[Table_Step4]![CO-Exhaust_Scenario]+(0.273)*[Table_Step4]![CO2-Exhaust_Scenario])*2000/(0.854*6.17), Table_Step4.FUELCONSUMPTION_EVAP_Scenario = ([Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-EVAP]*2000/6.17, " & _

"Table_Step4.FUELCONSUMPTION_TOTAL_Scenario = ((12.011/(12.011+0.54*1.008))*([Table_Step4]![HC-Exhaust_Scenario]*[FRACTIONS]![FR-TOG])+(0.429)*[Table_Step4]![CO-Exhaust_Scenario]+(0.273)*[Table_Step4]![CO2-Exhaust_Scenario])*2000/(0.854*6.17)+(([Table_Step4]![HC-EVAP-HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-RESTING_Scenario]+[Table_Step4]![HC-EVAP-RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-EVAP])*2000/6.17, Table_Step4.NH3_Scenario = (((12.011/(12.011+0.54*1.008))*([Table_Step4]![HC-Exhaust_Scenario]*[FRACTIONS]![FR-TOG])+(0.429)*[Table_Step4]![CO-Exhaust_Scenario]+(0.273)*[Table_Step4]![CO2-

```
Exhaust_Scenario])*2000/(0.854*6.17)+(([Table_Step4]![HC-EVAP-
HOTSOAK_Scenario]+[Table_Step4]![HC-EVAP-
DIURNAL_Scenario]+[Table_Step4]![HC-EVAP-
RESTING_Scenario]+[Table_Step4]![HC-EVAP-
RUNNINGLOSS_Scenario])*[FRACTIONS]![FR-ROG-
EVAP])*2000/6.17)*116/1000/454/2000;"

DoCmd.SetWarnings True

End Function
```

Attachment D:

Economic Analysis Methodology for Off-Highway Recreational Vehicles

May 2013

California Air Resources Board

Monitoring and Laboratory Division

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TABLE OF CONTENTS

I. **EXECUTIVE SUMMARY** 1
II. **BACKGROUND** 2
III. **COST IMPACTS METHODOLOGY** 2
A. **METHODOLOGY** 2
1. *ARB Cost Survey Development – Stakeholder Participation* 4
2. *Assumptions* 9
IV. **COST IMPACT ANALYSIS** 11
A. **COST ESTIMATE EQUATIONS** 13
1. *Adjusted Total Incremental Cost* 13
2. *Weighted Incremental Cost* 14
3. *Adjusted Total Fixed Cost per Year (Costs Reported at MSRP)* 14
4. *Weighted Fixed Costs per Year* 14
5. *Weighted Fixed Cost per OHRV* 14
6. *Cost-Effectiveness per OHRV per Pound ROG* 15
7. *Total Costs per Vehicle per Family* 15
B. **COST PER VEHICLE** 15
C. **TOTAL COST OF REGULATION** 16
D. **TOTAL COST ESTIMATE EQUATIONS** 20
1. *Total Weighted Incremental Cost* 20
2. *Fuel Savings* 20
3. *Annualized Weighted Fixed Cost* 20
4. *Annualized Costs for New Sales* 20
5. *Cumulative Annualized Costs* 21
6. *Present Value of Cumulative Annualized Costs* 21
7. *Cost-Effectiveness of Regulation* 21
E. **COST-EFFECTIVENESS** 21
F. **COST IMPACTS** 23
1. *Small Volume Manufacturers* 23
2. *Brand Unavailability/Market Shift* 25
3. *Reporting Costs* 25
G. **IMPACT TO INDIVIDUAL CONSUMER** 25
1. *Direct Impact* 25
2. *Indirect Impact* 26
H. **IMPACT TO DEALERS** 26

I. COST SAVINGS 26
1. *Fuel Efficiency Savings* 26
2. *Evaporative Control Savings* 27
J. ALTERNATIVES 27
1. *No Action* 27
2. *Removal of the "Tip Test"* 28
3. *Separate Standards for Each Mode of Use* 28
V. SUMMARY 29
VI. REFERENCES 30
VII. APPENDIX 31

LIST OF TABLES

Table III-1. Tabulated Cost Increase Data for Low Estimate Scenario 7
Table III-2. Tabulated Cost Increase Data for High Estimate Scenario 8
Table III-3. Cost Analysis Parameters for Low and High Estimate Scenarios 9
Table IV-1. Cost Analysis Data for Low Estimate Scenario 12
Table IV-2. Cost Analysis Data for High Estimate Scenario 13
Table IV-3. Total Lifetime Cost and Cost-Effectiveness for Low Estimate Scenario 18
Table IV-4. Total Lifetime Cost and Cost-Effectiveness for High Estimate Scenario 19
Table IV-5. Summary of Cost-Effectiveness Values for OHRV Regulation 22
Table IV-6. Small Volume Manufacturer Component Costs 24
Table IV-7. Small Business Incremental Component Cost per Vehicle 25
Table IV-8. Summary of Estimated Reporting Costs 25

LIST OF FIGURES

Figure II-1. Types of OHRVs Registered in California 2
Figure III-1. California OHRV Market Share by Manufacturer 5
Figure IV-1. Summary of OHRV Cost per Vehicle per Evaporative Family 16
Figure IV-2. Cost-Effectiveness per Evaporative Family 22
Figure VII-1. ARB Cost Survey (Page 1) 31
Figure VII-2. ARB Cost Survey (Page 2) 32
Figure VII-3. ARB Cost Survey 2 (Page 1) 33
Figure VII-4. ARB Cost Survey 2 (Page 2) 34
Figure VII-5. ARB Cost Survey 2 (Page 3) 35
Figure VII-6. ARB Cost Survey 2 (Page 4) 36
Figure VII-7. ARB Cost Survey 2010 (Page 1) 37
Figure VII-8. ARB Cost Survey 2010 (Page 2) 38
Figure VII-9. ARB Cost Survey 2010 (Page 3) 39

LIST OF ACRONYMS

ARB	[California] Air Resources Board
ATV	All-Terrain Vehicle
DMV	[California] Department of Motor Vehicles
ISOR	Initial Statement of Reasons
MIC	Motorcycle Industry Council
MY	Model Year
OHRV	Off-Highway Recreational Vehicles
OMC	Off-Road Motorcycle
PY	Person Year
ROG	Reactive Organic Gases
TP	Test Procedure
TOG	Total Organic Gases
TPD	Tons per Day (emissions rate)
U.S.C.	United States Code
U.S. EPA	United States Environmental Protection Agency

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I. EXECUTIVE SUMMARY

Attachment D provides detailed information on the methodology used to estimate economic impacts for the proposed off-highway recreational vehicle (OHRV) evaporative emission control requirements. The OHRV population is divided into three main categories: all-terrain vehicles (ATV), off-road motorcycles (OMC), and specialty vehicles (e.g., side-by-side vehicles, and sand cars, etc.) which collectively represent more than 93 percent of the California OHRV population. When fully implemented, the proposed regulation is expected to provide substantial emission reductions in reactive organic gases (ROG). ROG is a precursor for ground level ozone throughout California.

Air Resources Board (ARB) staff collected data on compliance costs by distributing a survey to OHRV manufacturers. The information received from the surveys was then separated into low-cost and high-cost scenarios. The cost to comply with the OHRV regulation is $216 per OHRV in the low cost estimate and $465 per OHRV in the high cost estimate which represent 4 to 9 percent of the retail costs of the OHRV. Using the increased costs per vehicle for both low and high cost scenarios, the annualized costs were determined and the total estimated lifetime cost for the proposed OHRV regulation was calculated. The total lifetime cost of the proposed rule is about $90 million for the low estimate and $215 million for the high estimate.

The cost impact analysis is highly dependent on future OHRV sales. The steps required for OHRV manufacturers to comply with the proposed evaporative standards are expected to lead to price increases that will be borne by the purchaser. The influence of the poor economy and relatively long useful lives of OHRVs contribute to the slow turnover to controlled OHRVs in California. Staff collaborated with manufacturers and stakeholders to mitigate the cost impact of the proposed regulation by delaying the implementation until model year (MY) 2018 and by designing a flexible phase-in for OHRV compliance.

As the number of OHRVs sold in California per family per year decreases, the per-vehicle cost increases. For low sales volumes families, OHRV manufacturers may choose not to sell their low volume models in California. Staff assumes that companies with high volume sales of those types of OHRV will step in to meet consumer demand, thus causing a shift in the market share towards higher volume manufacturers.

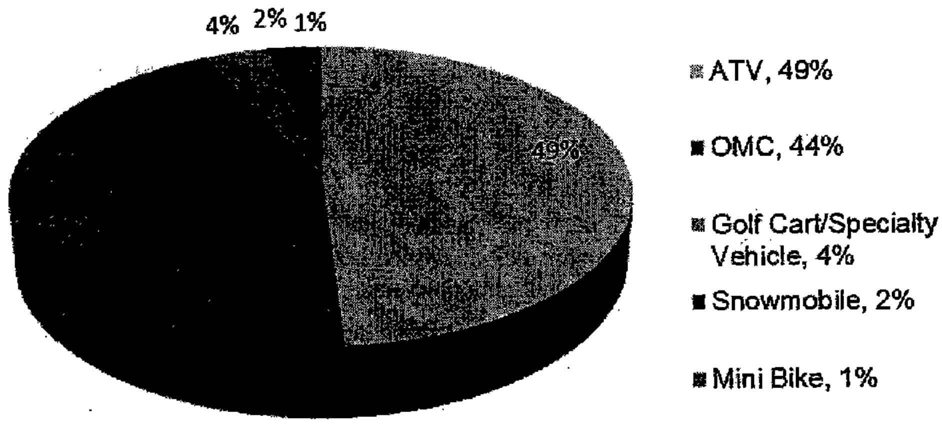
Overall, the proposed OHRV regulation is cost-effective, ranging from an estimated $4.09 to $9.76 dollars per pound of ROG reductions with an average of $6.93. The cost of the regulation does not include the cost savings associated with a likely shift to fuel injection as a result of this proposed regulation. The phase-in option allows manufacturers to delay the compliance of more costly evaporative families. This is allowed as long as 75 percent of their fleet is compliant during phase-in and fully compliant in 2022.

II. BACKGROUND

In March 2006, at a public workshop in El Monte, California, ARB introduced the concept of more comprehensive and stringent evaporative emissions standards for OHRVs. In 2007, ARB adopted OHRV evaporative permeation standards for fuel tanks and fuel hoses to harmonize with federal standards set by the United States Environmental Protection Agency (U.S. EPA).

The proposed regulation will further reduce ROG by controlling evaporative emissions generated during the three evaporative usage modes: running loss, hot soak, and diurnal. Staff used cost data provided by OHRV manufacturers and vehicle registration data from the California Department of Motor Vehicles (DMV, 2010) for the largest segments of OHRVs to determine the cost per vehicle, the total cost over the lifetime of the regulation, and the cost-effectiveness. As shown in Figure II-1, in 2010, more than 93 percent of OHRVs registered in California were ATVs and OMCs with less than 10 percent being specialty vehicles.

Figure II-1. Types of OHRVs Registered in California



Source: 2010 Department of Motor Vehicles Registration Data

III. COST IMPACTS METHODOLOGY

This section describes the data sources, methodology, and assumptions used in assessing the cost impacts of the proposed OHRV regulation.

A. METHODOLOGY

The methodology used to determine the economic impacts of the proposed OHRV regulation is based primarily on manufacturer supplied cost estimates. Based on what has been observed in implementation of other mobile source regulations, it is assumed manufacturers will try to keep compliance costs low by using transferable technology from the on-road sector. Staff believe that much of the technology used in on-road applications can cost-effectively be scaled down for use on OHRVs. This technology includes any combination of the following technologies, but is not limited to the following:

- Low permeation fuel hose
- Low permeation fuel tank
- Carbon canister
- Pressure relief valves
- Tank placement/insulation
- Connectors
- Improved carburetors
- Fuel injection

The proposed standards are not prescriptive so it is anticipated that manufacturers will meet the standards with a combination of evaporative control technologies, including low permeation hoses, low permeation fuel tanks, carbon canister/pressure relief valves, and fuel injection.

In conducting this assessment, staff also considered testing and certification costs. The proposed OHRV regulation was designed to verify emissions control for running loss and hot soak events without requiring additional expensive performance tests. The test procedure developed for this regulation includes running loss and hot soak events as preparation cycles to reduce evaporative testing costs.

Using data received from OHRV manufacturers, total cost was calculated by combining component cost estimates for each vehicle with fixed cost estimates for each evaporative family. All cost data was adjusted for retail markup and weighted by family size. The incremental cost increases were then combined and added to the total estimated fixed costs to yield the total estimated cost increase per vehicle. Low and high cost estimates were then developed based on cost survey responses.

The total cost of the proposed regulation was determined by converting the estimated weighted annual cost per vehicle, as described above, into an amortized payment to represent the overall price increase for compliance for the life of the rule. The amortized payment was then multiplied by the annual sales. The life of the rule is defined as the mean life of an OHRV (21 years) in California. Annual sales are based on projections from ARB's OHRV emissions inventory model that was updated as part of this regulatory process. The annual sales have been adjusted to reflect the proposed phase-in schedule for model years 2018 to 2021. The resulting annual cost for regulatory compliance was also adjusted for each vehicle model year to reflect present value (2013$) by applying a discount rate of five percent. Summation of all the annual costs for compliance from MY2018 through MY2038 provided the total cost of the proposed OHRV evaporative emission regulation.

The cost-effectiveness of the regulation was estimated by taking the sum of the amortized costs in 2035 and dividing by the tons per day (TPD) of reactive organic gases (ROG) reduced by this proposed regulation in 2035 (the last year of the emissions model projection). The cost of the regulation takes into account cost savings to the end user from reduced fuel loss resulting from evaporative controls. The cost of the regulation does not include the likely cost savings from the expected shift to electronic fuel injection that the regulation will likely bring about. EFI will lead to a substantial increase in fuel economy.

The proposed regulation was designed to allow a manufacturer to reduce overall compliance costs by using credits. The proposed regulation allows OHRV manufacturers to produce a group of vehicles that exceed the proposed evaporative emission standards if they have sufficient credits from vehicles that are certified below the proposed emissions standard. However, no single evaporative family can exceed three times the emission limit. This analysis takes a conservative approach and does not include a credit analysis.

1. *ARB Cost Survey Development – Stakeholder Participation*

In January 2013, ARB requested cost information from manufacturers for complying with the proposed regulation. A cost survey form was also posted on ARB's OHRV webpage. In addition, ARB sent out an announcement of the posting on the off-road recreational vehicle List Serve, to over 2600 subscribers. Staff also directly emailed the request to several OHRV manufacturers and members of the Motorcycle Industry Council (MIC).

a. Cost Survey Forms

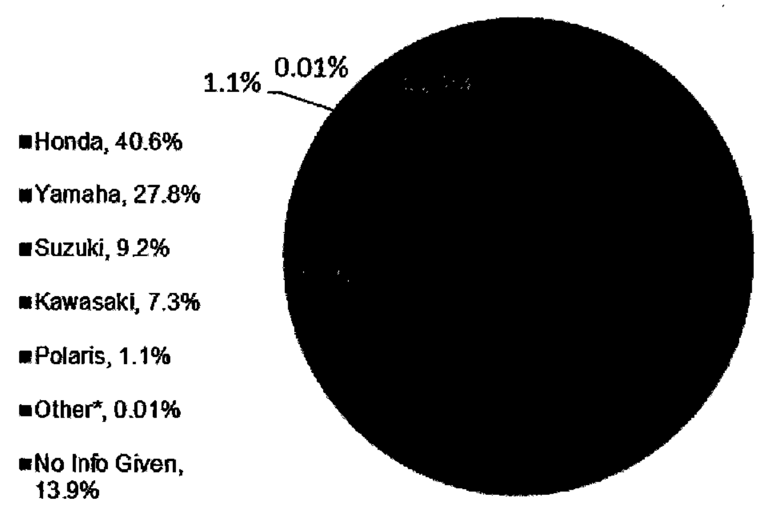
The cost survey forms developed by ARB staff (Figure VII-1 through Figure VII-6 presented in the Appendix) were given to OHRV manufacturers to provide estimated costs for complying with the proposed evaporative emissions performance standards. The survey form allowed manufacturers to show their emissions control incremental and fixed costs based on OHRV type for forecasted MY2018 sales. Manufacturers were asked to provide incremental cost information for low permeation fuel hoses and fuel tanks, carbon canisters, pressure relief valves, fuel management systems and components, fuel injection, roll-over valves and other components they might be considering using in their evaporative control systems. Manufacturers were also asked to provide fixed costs related to OHRV re-design; performance testing, and certification. Manufacturers were also encouraged to provide any descriptive information about other control components or re-design concepts that might have an impact on cost.

b. Cost Survey Results

ARB sent the cost surveys to OHRV manufacturers through the MIC who collectively represent the manufacturers of 86 percent of California's OHRV sales according to 2006-2009 DMV OHRV registration data (Figure III-1). Staff received responses from four OHRV manufacturers representing approximately 50 percent of the total California market share. The respondents represented large and small manufacturers. All the data used to estimate the cost of this regulation were confidential costs self-reported by industry. Some of the cost information received was submitted anonymously and did not contain projected sales figures. Data that did not contain projected sales figures were omitted and were not used in the cost evaluation. The omitted information contained data for eight anonymously-reported evaporative families.

To preserve manufacturer anonymity, the remaining incremental cost data is aggregated and listed by evaporative family with no designation of vehicle category. The cost analysis focused primarily on ATV and OMC categories, which account for more than 90 percent overall OHRV sales in California.

Figure III-1. California OHRV Market Share by Manufacturer



* Includes all manufacturers with less than 100 units 'Grand Total'

Source: 2006-2009 DMV Registration Data

For some evaporative families where OHRV manufacturers were unsure about estimating incremental cost data, a cost range for control options was provided. For example, manufacturers estimated that the incremental cost for adding fuel injection to comply with ARB's proposed regulation as a range. Another variable used to bracket the low and high cost estimates was the time between vehicle evaporative family redesigns. In the case where redesign time was not provided, staff assumed a range of as few as 5 years and up to 10 years between evaporative family redesign. Using cost data as received, and including cost data that was provided in a range format, low and high cost estimate scenarios were created. The low estimate scenario assumes a 10-year evaporative family life (unless otherwise noted by the manufacturer) and the lower fuel management incremental cost increase of $0 (Table III-1). The high cost scenario assumes a 5-year evaporative family life (unless otherwise noted by the manufacturer) and the higher fuel management incremental cost increase (Table III-2). The fuel cost savings (fuel offsets) from the proposed evaporative controls are calculated in Section IV.i.2 for the number of compliant vehicles in each fleet year and subtracted from the annual costs per year.

Table III-1. Tabulated Cost Increase Data for Low Estimate Scenario OHRV Emission Control, 2013$

			Incremental Costs ($ per vehicle)						Fixed Costs ($ per evap family)			
Family Size	Evap Family Life (years)	Displacement Range (cc)	Hose	Tank	CC or PRV	Fuel Management	Other	Retail (Y/N)	Re-design (cost per evap family)	Retail (Y/N)	Testing & Certification (cost per evap family)	Retail (Y/N)
C*	10	450	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	650	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	400	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	500	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	800	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	250	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	800	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	1000	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	350	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	450-500	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	550	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	590	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	1000	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	600 +	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	3	850	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	812	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	1000	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	10	50-249	C*	C*	C*	C*	C*	Y	C*	y	C*	N
C*	10	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	10	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	10	50-249	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	10	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	10	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	10	600-1000	C*	C*	C*	C*	C*	Y	C*	Y	C*	N

Notes: C* = Confidential Data used

* The low cost estimate assumes a 10-year evaportive family life and low fuel management costs while the high cost estimate assumes a 5-year evaporative family life and fuel management costs.

CC or PRV = Carbon Canister or Pressure Relief Valve

ROG = Reactive Organic Gas

Applied 20% retail increase to incremental costs where needed.

Table III-2. Tabulated Cost Increase Data for High Estimate Scenario OHRV Emission Control, 2013$

			Incremental Costs ($ per vehicle)						Fixed Costs ($ per evap family)			
Family Size	Evap Family Life (years)	Displacement Range (cc)	Hose	Tank	CC or PRV	Fuel Management	Other	Retail (Y/N)	Re-design (cost per evap family)	Retail (Y/N)	Testing & Certification (cost per evap family)	Retail (Y/N)
C*	5	450	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	650	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	400	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	500	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	800	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	250	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	800	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	1000	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	350	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	450-500	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	550	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	590	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	1000	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	600 +	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	3	850	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	812	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	3	1000	C*	C*	C*	C*	C*	N	C*	N	C*	N
C*	5	50-249	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	5	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	5	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	5	50-249	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	5	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	5	250-600	C*	C*	C*	C*	C*	Y	C*	Y	C*	N
C*	5	600-1000	C*	C*	C*	C*	C*	Y	C*	Y	C*	N

Notes: C* = Confidential Data used

* The low cost estimate assumes a 10-year evaportive family life and low fuel management costs while the high cost estimate assumes a 5-year evaporative family life and fuel management costs.

CC or PRV = Carbon Canister or Pressure Relief Valve

ROG = Reactive Organic Gas

Applied 20% retail increase to incremental costs where needed.

The lifespan of an evaporative family is crucial to the cost analysis because it is used as the fixed cost amortization period. The inverse relationship between lifespan and annual cost has a significant impact on the overall cost-effectiveness of this regulation. The low and high cost estimate approach was chosen to preserve the integrity of the costs provided by respondents who could not project or provide an exact cost estimate.

Staff assumed OHRV manufacturers are at liberty to select any combination of evaporative emission control strategies and low-emission components for specific evaporative families; therefore, the range of incremental costs varies widely depending upon the mix of strategies and components used by the manufacturers.

A 20 percent increase (1.20 indirect cost multiplier) was applied to all cost data (unless it was already included by the manufacturer) to account for retail profit at the manufacturing and dealer/distributor level.

2. *Assumptions*

Wherever possible, staff relied on actual data provided by manufacturers, only in the cases where data was not available staff made assumptions, which included: time between vehicle platform redesigns, cost of fuel management systems, conversions from manufacturer's cost to manufacturer's suggested retail price, and life expectancy of an average OHRV.

a. Evaporative Family Lifespan and Fuel Management System Costs

When defining the low and high cost scenarios, both were evaluated based on evaporative family life span and fuel management system cost. The lifespan of an evaporative family affects the cost per year (Table III-3). As an evaporative family life span decreases the annualized fixed costs increase.

The costs associated with fuel management systems varied due to the wide range of redevelopment costs associated with altering existing fuel management systems or transitioning from carburetion to electronic fuel injection.

Table III-3. Cost Analysis Parameters for Low and High Estimate Scenarios

Cost Analysis	Evaporative Family Life*	Fuel Management Assumption
Low Estimate	10 years	Low Cost
High Estimate	5 years	High Cost

*Time between vehicle platform redesigns

b. Indirect Cost Multiplier

Using the guidelines provided in the Automobile Industry Retail Equivalent and Indirect Cost Multipliers Report (U S. EPA, 2009), staff assumed that modifying existing on-road evaporative components for use in OHRVs would require a medium level of technological complexity as a result of modular and architectural changes. Staff applied a retail markup of 20 percent or cost multiplier of 1.20

(USEPA, 2009). The markup converts manufacturers' costs to retail price increase. The indirect cost multiplier was applied to all cost data (unless it was already included by the manufacturer) received through ARB's cost survey.

c. Average Life Expectancy

Based on OHRV survival curves developed by ARB staff and presented in Attachment C: Emissions Estimation Methodology for Recreational Vehicles, of the Initial Statement of Reasons (ISOR), staff assumed in this economic analysis that the mean life for OHRVs used in California is 21 years. This value (in years) is an average calculated from the estimated life spans of OMCs (20) and ATVs (22), which make up approximately equal parts of the OHRV fleet in California. Also referred to as the useful life, the mean life defines the length of time an average vehicle is in operation. In order to determine the lifetime compliance costs associated with the proposed regulation, all cost calculations and projections are carried out through MY2018 to MY2038.

d. OHRV Population

Staff consulted several data sources in order to estimate the OHRV population at different points in time. Historical population data was provided by the DMV, while forecasted sales were extracted from the ARB's RV2013 emissions inventory model beginning with calendar year 2018 (see Attachment C). ARB's emissions inventory model was the basis for determining the cost-effectiveness of the regulation throughout the useful life of an OHRV. However, costs on a per unit basis at the point of production and first retail sale were based on sales estimates provided by survey respondents.

e. OHRV Warranty

This regulatory proposal includes a 30 month warranty for all evaporative emission-related repairs that cost less than $200, which is similar to the existing 30 month warranty for fuel lines, tanks, and exhaust-related parts. In addition, this regulation extends the warranty to 60 months for all evaporative emissions-related repairs that cost more than $200, adjusted for inflation. The costs associated with complying with the 30 month warranty are expected to be negligible because all the evaporative components are already covered by the current evaporative regulations, with the exception of the carbon canister. The warranty costs associated with carbon canisters is expected to be small based on the low failure rate for on-road vehicle carbon canisters. The small increase in warranty costs to manufacturers associated with the 60 month warranty is assumed to be included in the industry-provided cost estimates.

IV. COST IMPACT ANALYSIS

For each evaporative family, the adjusted total incremental cost was obtained by summing all costs for evaporative components and applying the indirect cost multiplier as appropriate. Likewise, an adjusted total fixed cost per year was determined by summing all annualized fixed costs and applying the indirect cost multiplier where applicable. Weighted fixed costs per vehicle were independently calculated by dividing the respective total adjusted costs by the evaporative family size, or manufacturer projected sales in MY 2018 as reported by each manufacturer. Because manufacturers are expected to amortize fixed costs, the Adjusted Total Fixed Cost per Year values were calculated based on the evaporative family lifetime and five percent interest.

Table IV-1. Cost Analysis Data for Low Estimate Scenario OHRV Emission Control, 2013$

Adjusted Total Incremental Cost ($retail per vehicle)	Weighted Incremental Cost ($retail)	Adjusted Total Fixed Cost per Year($retail per family)	Weighted Fixed Costs per Year ($retail)	Weighted Fixed Cost ($ per vehicle)	Cost Effectiveness ($ per pound ROG)	Total Cost per Vehicle per Family
$237.60	$ 0.06	$ 223,318	$ 59.43	$ 5.40	289.32	20,539.21
$294.00	$ 0.19	$ 61,015	$ 39.85	$ 1.48	35.97	2,553.80
$267.60	$ 0.21	$ 68,288	$ 54.52	$ 1.65	32.92	2,336.93
$294.00	$ 0.23	$ 68,288	$ 54.52	$ 1.65	33.29	2,363.33
$102.00	$ 0.11	$ 38,000	$ 41.37	$ 0.92	13.33	946.45
$192.00	$ 0.41	$ 18,649	$ 39.70	$ 0.45	5.69	403.92
$294.00	$ 0.95	$ 189,513	$ 609.75	$ 4.58	24.21	1,718.91
$294.00	$ 1.00	$ 197,999	$ 670.58	$ 4.79	24.06	1,708.28
$192.00	$ 0.78	$ 7,770	$ 31.58	$ 0.19	3.36	238.25
$192.00	$ 1.30	$ 7,770	$ 52.44	$ 0.19	3.10	219.85
$38.40	$ 0.37	$ 70,259	$ 679.87	$ 1.70	3.02	214.05
$38.40	$ 0.37	$ 70,259	$ 679.87	$ 1.70	3.02	214.05
$102.00	$ 1.28	$ 140,561	$ 1,768.19	$ 3.40	5.24	372.31
$303.30	$ 5.14	$ 13,332	$ 225.77	$ 0.32	4.54	322.35
$38.40	$ 0.74	$ 70,259	$ 1,359.74	$ 1.70	1.78	126.22
$36.00	$ 0.87	$ 94,495	$ 2,285.96	$ 2.29	1.84	130.49
$38.40	$ 0.93	$ 70,259	$ 1,699.66	$ 1.70	1.53	108.66
$316.90	$ 8.13	$ 14,419	$ 369.74	$ 0.35	4.66	330.50
$333.60	$ 14.20	$ 16,531	$ 703.84	$ 0.40	4.83	342.99
$333.60	$ 14.20	$ 16,531	$ 703.84	$ 0.40	4.83	342.99
$489.90	$ 32.95	$ 19,609	$ 1,318.73	$ 0.47	7.00	496.95
$183.60	$ 32.38	$ 33,218	$ 5,858.09	$ 0.80	2.65	188.16
$183.60	$ 32.38	$ 33,218	$ 5,858.09	$ 0.80	2.65	188.16
$86.60	$ 28.53	$ 52,318	$ 17,238.11	$ 1.27	1.27	90.44

	Incremental	Fixed
Average Life of Vehicle (years)	21	21
Total Size of All Families	41,337	41,337
Average Cost per Family		$ 42,403
Weighted Cost for OHRVs	$ 177.72	$ 38.61

Retail Markup (%)	20%
Interest Rate (APR)	5.00%

Table IV-2. Cost Analysis Data for High Estimate Scenario OHRV Emission Control, 2013$

Adjusted Total Incremental Cost ($retail per vehicle)	Weighted Incremental Cost ($retail)	Adjusted Total Fixed Cost per Year($retail per family)	Weighted Fixed Costs per Year ($retail)	Weighted Fixed Cost ($ per vehicle)	Cost Effectiveness ($ per pound ROG)	Total Cost per Vehicle per Family
$237.60	$ 0.06	$ 398,293	$ 105.99	$ 9.64	513.38	36,446.05
$294.00	$ 0.19	$ 108,821	$ 71.08	$ 2.63	60.91	4,324.41
$267.60	$ 0.21	$ 121,793	$ 97.23	$ 2.95	55.76	3,958.31
$294.00	$ 0.23	$ 121,793	$ 97.23	$ 2.95	56.13	3,984.71
$102.00	$ 0.11	$ 67,774	$ 73.78	$ 1.64	22.65	1,608.09
$192.00	$ 0.41	$ 33,260	$ 70.81	$ 0.80	8.03	569.96
$294.00	$ 0.95	$ 338,001	$ 1,087.50	$ 8.18	39.94	2,835.36
$294.00	$ 1.00	$ 353,136	$ 1,196.00	$ 8.54	39.67	2,816.40
$192.00	$ 0.78	$ 13,858	$ 56.32	$ 0.34	3.87	274.49
$192.00	$ 1.30	$ 13,858	$ 93.54	$ 0.34	3.40	241.67
$38.40	$ 0.37	$ 70,259	$ 679.87	$ 1.70	3.02	214.05
$38.40	$ 0.37	$ 70,259	$ 679.87	$ 1.70	3.02	214.05
$102.00	$ 1.28	$ 250,694	$ 3,153.61	$ 6.06	8.23	584.10
$626.30	$ 10.61	$ 23,779	$ 402.67	$ 0.58	9.30	660.27
$38.40	$ 0.74	$ 70,259	$ 1,359.74	$ 1.70	1.78	126.22
$36.00	$ 0.87	$ 94,495	$ 2,285.96	$ 2.29	1.84	130.49
$38.40	$ 0.93	$ 70,259	$ 1,699.66	$ 1.70	1.53	108.66
$316.90	$ 8.13	$ 25,716	$ 659.44	$ 0.62	4.81	341.16
$333.60	$ 14.20	$ 29,483	$ 1,255.31	$ 0.71	4.94	350.35
$333.60	$ 14.20	$ 29,483	$ 1,255.31	$ 0.71	4.94	350.35
$489.90	$ 32.95	$ 34,973	$ 2,352.00	$ 0.85	7.08	502.48
$506.60	$ 89.34	$ 59,244	$ 10,448.06	$ 1.43	7.25	514.73
$506.60	$ 89.34	$ 59,244	$ 10,448.06	$ 1.43	7.25	514.73
$409.60	$ 134.96	$ 93,311	$ 30,744.62	$ 2.26	5.87	416.45

	Incremental	Fixed
Average Life of Vehicle (years)	21	21
Total Size of All Families	41,337	41,337
Average Cost per Family		$ 70,374
Weighted Cost for OHRVs	403.54	61.74

Retail Markup (%)	20%
Interest Rate (APR)	5.00%

A. COST ESTIMATE EQUATIONS

The following cost estimate equations are used to develop values in each of the cells in the columns of Tables IV-1 and IV-2.

1. *Adjusted Total Incremental Cost*

$$ATIC = [(\sum ICI) \times ICM]$$

Where,
ATIC = Adjusted Total Incremental Costs
ICI = Incremental Cost Increases/Technology Type
ICM = Indirect Cost Multiplier (20 percent)

2. *Weighted Incremental Cost*

$$WIC = ATIC \times \frac{FS}{SFS}$$

Where,
WIC = Weighted Incremental Cost
ATIC = Adjusted Total Incremental Costs
FS = Family Size
SFS = Sum of All Family Sizes in Survey

3. *Adjusted Total Fixed Cost per Year (Costs Reported at MSRP)*

$$ATFCY = PMT(IR, EFL,$$
$$SUM(\,IF\big(Retail(y/n) = \text{y}, RD, RD * (1 + RM)\big),$$
$$IF(Retail(y/n) = \text{"}y\text{"}, TCC, TCC * (1 + RM)))) * -1$$

Where,
ATFCY = Adjusted Total Fixed Cost per Year
RD = Redesign Cost
TCC = Testing and Certification Costs
IR = Interest Rate (5 percent)
FS = Family Size
RM = Retail Markup
EFL = Evaporative Family Lifespan
PMT and SUM are Functions from Microsoft Excel

4. *Weighted Fixed Costs per Year*

$$WFCY = (ATFCY \ \times FS) \div SFS$$

Where,
WFCY = Weighted Fixed Costs per Year
ATFCY = Adjusted Total Fixed Cost per Year
FS = Family Size
SFS = Sum of all Family Sizes in Survey

5. *Weighted Fixed Cost per OHRV*

$$WFC_{OHRV} \ = WFCY \ \div FS$$

Where,
WFC_{OHRV} = Weighted Fixed Cost per OHRV
WFCY = Weighted Fixed Cost per Year
FS = Family Size

6. Cost-Effectiveness per OHRV per Pound ROG

$$CE = \left(ATIC + \frac{ATFCY}{FS}\right) \div PR$$

Where,
CE = Cost-Effectiveness per OHRV per Pound
ATIC = Adjusted Total Incremental Costs
ATFCY = Adjusted Total Fixed Cost per Year
FS = Family Size
PR = Pounds Reduced per Controlled Vehicle

7. Total Costs per Vehicle per Family

$$TCV = ATIC + \frac{ATFCY}{FS}$$

Where,
TCV = Total Costs per Vehicle per Family
ATIC = Adjusted Total Incremental Costs
ATFCY = Adjusted Total Fixed Cost per Year
FS = Family Size

B. COST PER VEHICLE

The total weighted cost per vehicle is the sum of the weighted average incremental costs and fixed costs.

TWC = TWIC + TWFC

TWIC = $\sum(WIC)$

TWFC = $\sum(WFC_{OHRV})$

Where,
TWC = Total Weighted Cost
TWIC = Total Weighted Incremental Cost
TWFC = Total Weighted Fixed Cost
WFC_{OHRV} = Weighted Fixed Cost per OHRV
WIC = Weighted Incremental Cost

Figure IV-1. Summary of OHRV Cost per Vehicle per Evaporative Family

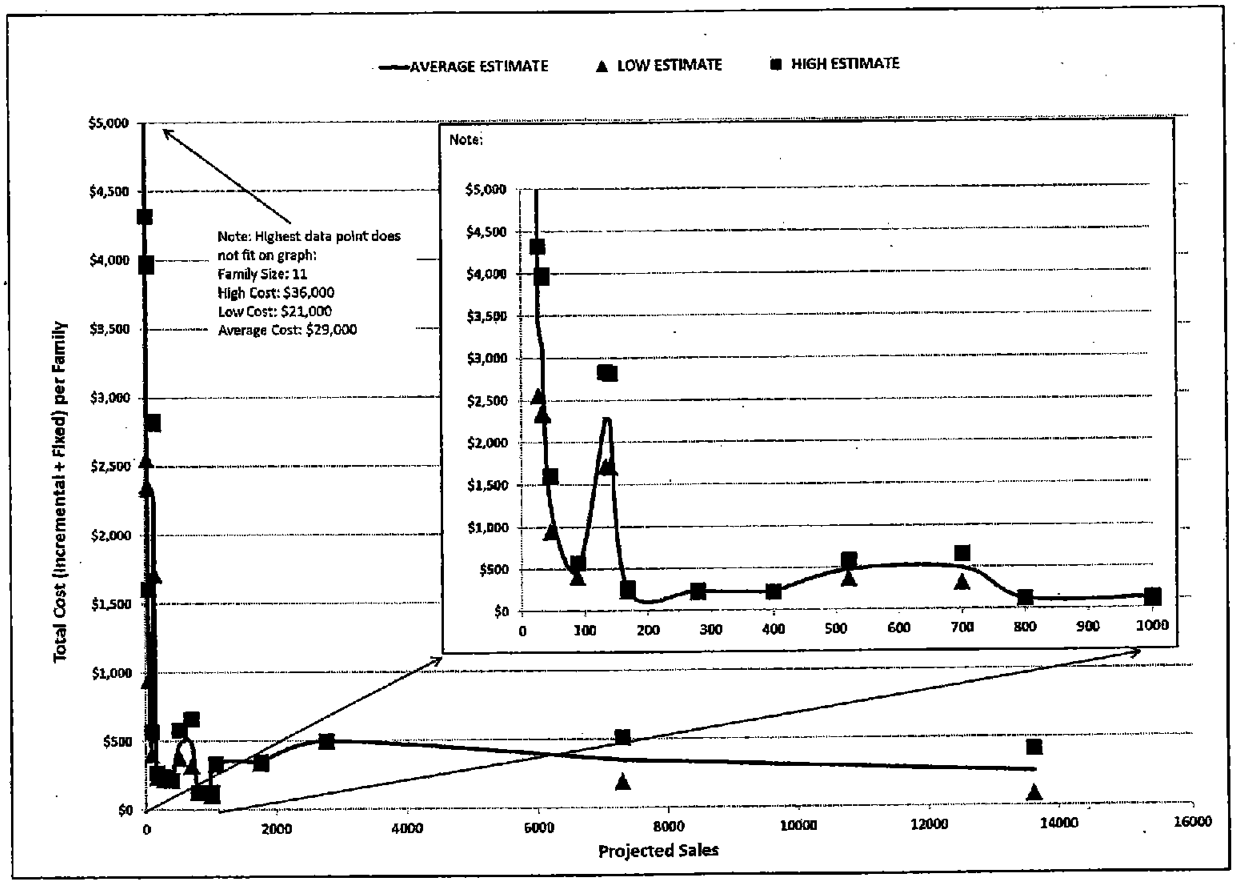


Figure IV-1 shows a summary of OHRV cost per vehicle per evaporative family based on the results of ARB's cost survey. The graph shows that the evaporative family cost decreases as projected sales increase.

C. TOTAL COST OF REGULATION

All the cost information used to develop the costs of this regulation were self-reported values supplied by manufacturers that will be subject to this regulatory proposal. Survey results were used regardless of cost and were omitted only if data was incomplete.

For the low and high cost estimates the annualized costs and the total lifetime cost for the proposed OHRV regulation was calculated. Cumulative annualized costs were estimated by multiplying the incremental cost increases by the projected annual OHRV sales from the emissions inventory model RV2013 to reflect the costs of all compliance vehicles operating within a calendar year. After converting the cumulative annualized costs to present value (2013$), the total lifetime cost of the proposed rule is about $90 million for the low estimate and $215 million for the high estimate. Based on the high estimate scenario values listed under Present Value of Cumulative Annualized Costs in Table IV-4, the economic impacts of the proposed regulation are expected to exceed the $10 million threshold for a major regulation.

OHRV sales in California are projected to increase over the next 20 years after the significant decline in sales associated with the 2007 economic downturn. Industry sales data from 2012 confirm that sales of off-road motorcycles and ATVs remain low due to the continued poor economy (MIC, 2013). As detailed in Attachment C: Emissions Estimation Methodology for Recreational Vehicles, ARB staff project that future OHRV sales in California will rebound based on the strong correlation between historical OHRV sales data and historical new housing starts. The expected annualized weighted fixed costs of the proposed regulations are expected to be between $2.7 million and $4.4 million as indicated in Table IV-3 and Table IV-4.

Table IV-3. Total Lifetime Cost and Cost-Effectiveness for Low Estimate Scenario for the Proposed OHRV Regulations, MY 2018 to MY2038 (2013$)

Weighted Incremental Cost Increase: $ 177.72 Discount Rate: 5%

Weighted Fixed Incremental Cost Increase: $ 38.61 Median Life of Vehicle (years): 21

Calendar Year	Annual OHRV Units Sold	Total Weighted Incremental Costs	Fuel Savings	Annualized Weighted Fixed Costs	Annualized Cost for New Sales	Cumulative Annualized Costs	Present Value of Cumulative Annualized Costs
2013	0	$0		$0	$0	$0	$0
2014	0	$0		$0	$0	$0	$0
2015	0	$0		$0	$0	$0	$0
2016	0	$0		$0	$0	$0	$0
2017	0	$0		$0	$0	$0	$0
2018	34071	$6,055,000	$114,000	$1,315,000	$461,000.00	$461,000	$361,000
2019	51720	$9,192,000	$167,000	$1,997,000	$706,000.00	$1,167,000	$871,000
2020	52341	$9,302,000	$163,000	$2,021,000	$720,000.00	$1,887,000	$1,341,000
2021	70625	$12,551,000	$212,000	$2,727,000	$980,000.00	$2,867,000	$1,940,000
2022	71473	$12,702,000	$209,000	$2,727,000	$994,000.00	$3,861,000	$2,489,000
2023	72330	$12,854,000	$207,000	$2,727,000	$1,008,000.00	$4,869,000	$2,989,000
2024	73198	$13,009,000	$206,000	$2,727,000	$1,021,000.00	$5,890,000	$3,444,000
2025	74077	$13,165,000	$205,000	$2,727,000	$1,035,000.00	$6,925,000	$3,856,000
2026	74965	$13,323,000	$205,000	$2,727,000	$1,047,000.00	$7,972,000	$4,228,000
2027	75865	$13,483,000	$205,000	$2,727,000	$1,059,000.00	$9,031,000	$4,561,000
2028	76775	$13,644,000	$206,000	$2,727,000	$1,071,000.00	$10,102,000	$4,859,000
2029	77697	$13,808,000	$206,000	$2,727,000	$1,084,000.00	$11,186,000	$5,124,000
2030	78629	$13,974,000	$207,000	$2,727,000	$1,096,000.00	$12,282,000	$5,359,000
2031	79573	$14,142,000	$208,000	$2,727,000	$1,108,000.00	$13,390,000	$5,564,000
2032	80528	$14,311,000	$209,000	$2,727,000	$1,120,000.00	$14,510,000	$5,742,000
2033	81494	$14,483,000	$210,000	$2,727,000	$1,132,000.00	$15,642,000	$5,895,000
2034	82472	$14,657,000	$212,000	$2,727,000	$1,144,000.00	$16,786,000	$6,025,000
2035	83461	$14,833,000	$213,000	$2,727,000	$1,157,000.00	$17,943,000	$6,134,000
2036	84239	$14,971,000	$214,000	$2,727,000	$1,166,000.00	$19,109,000	$6,221,000
2037	85161	$15,135,000	$215,000	$2,727,000	$1,178,000.00	$20,287,000	$6,290,000
2038	86082	$15,298,000	$216,000	$2,727,000	$1,190,000.00	$21,477,000	$6,342,000
						Total Lifetime Cost of OHRV Regulation (High Estimate) *:	$89,635,000
						Cost-Effectiveness of Regulation (for Form399):	4.09
						Cost-Effectiveness of a typical OHRV($/pound ROG) **:	3.05

Notes: * The Present Value of Cumulative Annualized Costs (Low Estimate) are not expected to exceed $10 million.

** Cost-Effectiveness was calculated using emissions model RV2013 population projections and estimated pounds per reactive organic gas (ROG) reductions from controlled vehicles.

Annual OHRV Units Sold values from CY2036 to CY2038 were calculated from a linear regression over the previous 18 years.

Table IV-4. Total Lifetime Cost and Cost-Effectiveness for High Estimate Scenario for the Proposed OHRV Regulations, MY 2018 to MY 2038 (2013$)

Incremental Weighted Cost Increase: $ 403.54 Discount Rate: 5%
Weighted Fixed Incremental Cost Increase: $ 61.74 Median Life of Vehicle (years): 21

Calendar Year	Annual OHRV Units Sold	Total Weighted Incremental Costs	Fuel Savings	Annualized Weighted Fixed Costs	Annualized Cost for New Sales	Cumulative Annualized Costs	Present Value of Cumulative Annualized Costs
2013	0	$0		$0	$0	$0	$0
2014	0	$0		$0	$0	$0	$0
2015	0	$0		$0	$0	$0	$0
2016	0	$0		$0	$0	$0	$0
2017	0	$0		$0	$0	$0	$0
2018	34071	$13,749,000	$114,000	$2,104,000	$1,122,000	$1,122,000	$879,000
2019	51720	$20,871,000	$167,000	$3,193,000	$1,710,000	$2,832,000	$2,113,000
2020	52341	$21,122,000	$163,000	$3,232,000	$1,737,000	$4,569,000	$3,247,000
2021	70625	$28,500,000	$212,000	$4,360,000	$2,351,000	$6,920,000	$4,684,000
2022	71473	$28,842,000	$209,000	$4,360,000	$2,381,000	$9,301,000	$5,996,000
2023	72330	$29,188,000	$207,000	$4,360,000	$2,410,000	$11,711,000	$7,190,000
2024	73198	$29,538,000	$206,000	$4,360,000	$2,438,000	$14,149,000	$8,273,000
2025	74077	$29,893,000	$205,000	$4,360,000	$2,467,000	$16,616,000	$9,252,000
2026	74965	$30,251,000	$205,000	$4,360,000	$2,495,000	$19,111,000	$10,135,000
2027	75865	$30,614,000	$205,000	$4,360,000	$2,523,000	$21,634,000	$10,927,000
2028	76775	$30,982,000	$206,000	$4,360,000	$2,551,000	$24,185,000	$11,633,000
2029	77697	$31,354,000	$206,000	$4,360,000	$2,580,000	$26,765,000	$12,261,000
2030	78629	$31,730,000	$207,000	$4,360,000	$2,608,000	$29,373,000	$12,815,000
2031	79573	$32,111,000	$208,000	$4,360,000	$2,637,000	$32,010,000	$13,301,000
2032	80528	$32,496,000	$209,000	$4,360,000	$2,666,000	$34,676,000	$13,722,000
2033	81494	$32,886,000	$210,000	$4,360,000	$2,695,000	$37,371,000	$14,085,000
2034	82472	$33,280,000	$212,000	$4,360,000	$2,724,000	$40,095,000	$14,392,000
2035	83461	$33,680,000	$213,000	$4,360,000	$2,754,000	$42,849,000	$14,648,000
2036	84239	$33,993,000	$214,000	$4,360,000	$2,777,000	$45,626,000	$14,855,000
2037	85161	$34,365,000	$215,000	$4,360,000	$2,805,000	$48,431,000	$15,017,000
2038	86082	$34,738,000	$216,000	$4,360,000	$2,833,000	$51,264,000	$15,138,000
Total Lifetime Cost of OHRV Regulation (High Estimate) *:							$214,563,000
Cost-Effectiveness of Regulation (for Form399):							9.76
Cost-Effectiveness of a typical OHRV($/pound ROG) **:							6.55

Notes: * The Present Value of Cumulative Annualized Costs (High Estimate) are expected to exceed $10 million.
** Cost-Effectiveness was calculated using emissions model RV2013 population projections and estimated pounds per reactive organic gas (ROG) reductions from controlled vehicles.
Annual OHRV Units Sold values from CY2036 to CY2038 were calculated from a linear regression over the previous 18 years.

D. TOTAL COST ESTIMATE EQUATIONS

The following cost estimate equations are used to develop values in each of the cells in the columns of Tables IV-3 and IV-4.

1. *Total Weighted Incremental Cost*

$$TWIC = AOUS \times WIC$$

Where,
TWIC = Total Weighted Incremental Costs
AOUS = Annual OHRV Units Sold
WIC = Weighted Incremental Cost

2. *Fuel Savings*

$$FS = Average\ (AOUS\ \times FCSY)$$

Where,
FS = Fuel Savings
AOUS = Annual OHRV Units Sold
FCSY = Fuel Cost Savings per Year (see Section i.2.A)
WFICI = Weight Fixed Incremental Cost Increase
Average function is taken over all years from implementation year to current year

3. *Annualized Weighted Fixed Cost*

$$AWFC = (AOUS\ \times WFICI)$$

Where,
AWFC = Annualized Weighted Fixed Cost
AOUS = Annual OHRV Units Sold
WFICI = Weight Fixed Incremental Cost Increase

4. *Annualized Costs for New Sales*

$$ACNS = \mathrm{PMT(IR, MLV, (TWIC + AWFC)\ )} - \mathrm{FS}$$

Where,
ACNS = Annualized Costs for New Sales
AWFC = Annualized Weighted Fixed Cost
TWIC = Total Weighted Incremental Costs
IR = Interest Rate (5 percent)

MLV = Median Life of Vehicle
FS = Fuel Savings
PMT Function from Microsoft Excel

5. *Cumulative Annualized Costs*

$$CAC = (\sum ACNS_{Previous\ Years}) + ACNS_{Current\ Year}$$

Where,
CAC = Cumulative Annualized Costs
ACNS = Annualized Costs for New Sales

6. *Present Value of Cumulative Annualized Costs*

$$PVCAC = CAC \times \left(((1 + IR)^{-YRS})\right)$$

Where,
PVCAC = Present Value of Cumulative Annualized Costs
CAC = Cumulative Annualized Costs
IR = Interest Rate (5 percent)
YRS = Difference in Years from Future and Present Years

7. *Cost-Effectiveness of Regulation*

$$CE = CAC \div PR$$

Where,
CE = Cost-Effectiveness (per Pound ROG for CY2035)
CAC = Cumulative Annualized Costs (For Controlled Vehicles operating in CY2035)
PR = Pounds Reduced in CY2035

E. COST-EFFECTIVENESS

Cost-effectiveness for the regulation was determined by adding all of the annualized retail costs for controlled vehicles and dividing by the ROG emissions benefit for 2035. The pounds of ROG emissions reduced was estimated for 2035 because the OHVR emission inventory goes out to calendar year 2035 and represents a fleet turnover of about 71.2 percent. Overall, the proposed OHRV regulation is cost-effective with low, high, and average estimates as shown earlier in Table IV-3 and Table IV-4, respectively.

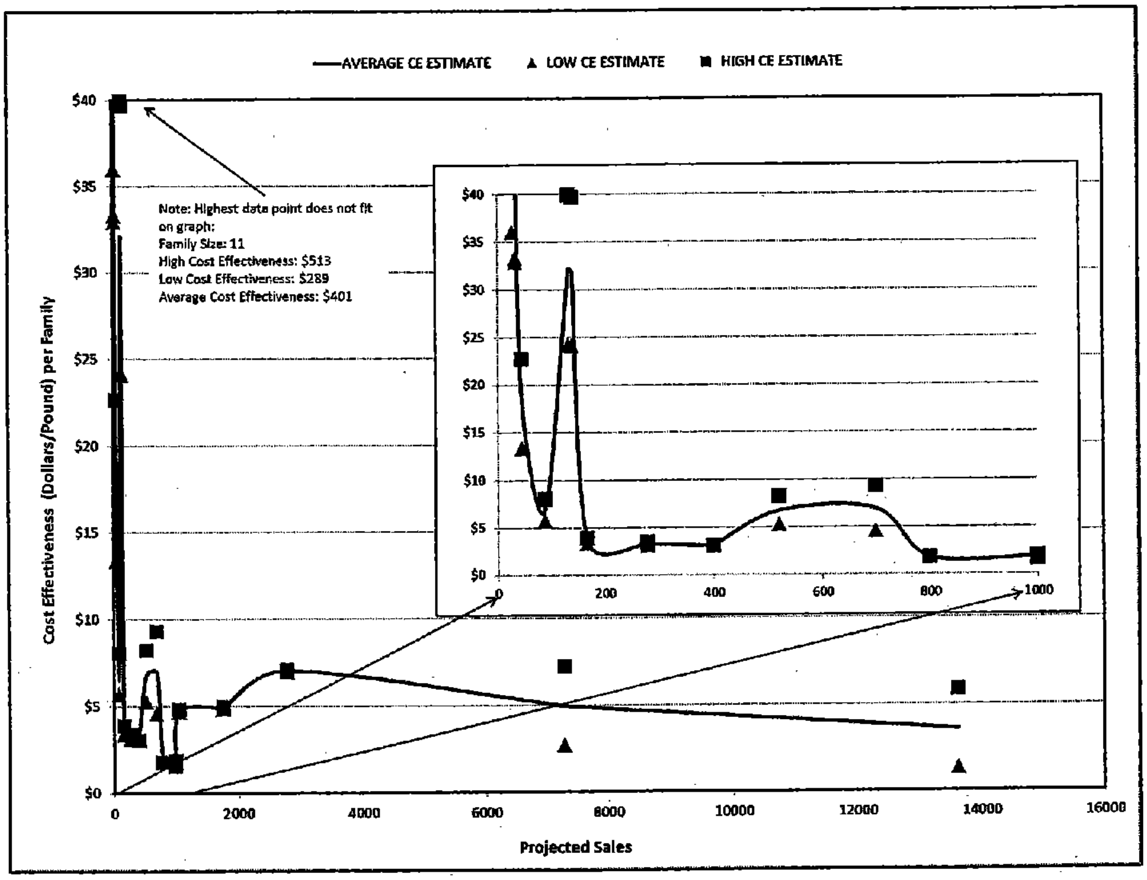
Table IV-5. Summary of Cost-Effectiveness Values for OHRV Regulation

	Weighted Average Overall Cost-Effectiveness* ($/lb.)
Low Estimate	4.09
High Estimate	9.76
Average	6.93

* Adjusted for retail by 20 percent, 2013$

Similar to the per evaporative vehicle family cost data, the cost-effectiveness values for each evaporative family varies widely based on estimated cost for compliance and projected sales. As the evaporative family volume decreases, the cost for compliance increases. For manufacturers whose model production is less than 50 units per year, staff proposes allowing a small volume alternative. For manufacturers who produce more than 50 but less than 150 units, the cost for compliance may result in a manufacturer choosing not to sell that model in California.

Figure IV-2. Cost-Effectiveness per Evaporative Family



Cost-effectiveness steeply declines and stabilizes as family size increases. The average cost-effectiveness of the regulation is $6.93 per pound of total organic gases (TOG). The proposed OHRV regulation is cost-effective. The cost-effectiveness of the proposed regulation includes cost reductions due to fuel savings. The phase-in option allows manufacturers to delay the compliance of more costly evaporative families so long as 75 percent of phase in OHRVs are compliant during the phase-in period.

F. COST IMPACTS

The results of the cost impact analysis are highly dependent on assumptions of future OHRV sales. Beginning with model year 2018, the evaporative emission requirements for OHRV manufacturers are expected to lead to price increases that will be borne by the purchaser. When the economy is prosperous, OHRV consumers who perceive these vehicles as luxury items are more likely to purchase new vehicles (IBIS, 2010a; IBIS, 2010b). Recent housing and unemployment trends are indicative of a rebounding economy. As described in Attachment C: Emissions Estimation Methodology for Recreational Vehicles, new projected OMC sales were based on strong correlation to new housing starts. Staff collaborated with manufacturers and stakeholders to mitigate the cost impact by delaying the implementation to model year 2018, which gives manufacturers several years of lead-time and provides time for new sales of OHRV to recover. In addition, staff is proposing a flexible phase-in period. The incentive for the phase-in structure is to comply as early as possible with low-cost evaporative families.

1. *Small Volume Manufacturers*

To mitigate the high-per-vehicle cost of low sales volume manufacturers, a small-volume option has been included in the proposed OHRV regulation for manufacturers of 50 or fewer new OHRVs per model year. The small volume option will allow small volume and ultra-custom OHRVs to be available in California without subjecting them to compliance testing and design. The small volume options will save small businesses the fixed costs associated with compliance. The small business population in California is dominated by sand cars so the costs in this section are calculated for them. Their costs are assumed to be restricted to annual reporting and incremental component costs of $282 per vehicle adjusted for 2013 dollars. Staff developed the small business incremental cost estimates through survey data submitted by fuel hose, fuel tank vent valve, and carbon canister manufacturers (Figures VII-7 through VII-9 presented in the Appendix). Cost estimates were based on an average OHRV, and the results are listed below in Table IV-6.

Table IV-6. Small Volume Manufacturer Component Costs

Emission Control Components	Component Code	Current U.S.EPA Specifcation Costs (2010$)	Proposed ARB Specification Costs (2010$)	Cost Difference (2010$)	Average Cost Difference (2010$)
Hose (5/16" Inside Diameter)	H-I	$0.43	$0.45	$0.02	$0.34
	H-II	$0.72	$0.72	$0.00	
	H-III	$1.97	$2.96	$0.99	
Carbon Canister (For 5.0 Gallon Fuel Tank)	CC-I	NA	$6.46	$0.00	$6.21
	CC-II	NA	$6.00	$6.00	
	CC-II	NA	$8.00	$8.00	
	CC-III	NA	$4.50	$4.50	
	CC-III	NA	$5.00	$5.00	
	CC-IV	NA	$10.00	$10.00	
	CC-IV	NA	$10.00	$10.00	

Note: NA = Not Applicable

For sand cars, staff found it necessary to adjust the OHRV hose, and carbon canister estimates commensurate with the specifications expected for sand cars. For fuel hoses, staff assumed that sand car manufacturers would use an inside diameter found in automotive applications, such as 5/16". As such staff assumed the average price increase for the incremental hose cost ($0.34 per linear feet) and a total of 5.0 feet installed per sand car. Since manufacturers estimated incremental carbon canister costs assuming a nominal fuel tank volume of 5.0 gallons, staff estimated the incremental cost using an average fuel tank volume of 30 gallons and an average price increase of $6.21. The cost differential of the fuel tanks themselves were estimated based on a comparison of plastic versus metallic aftermarket fuel cells. Unlike typical OHRV manufactures, sand car manufactures will not be subjected to the cost increases associated with electronic fuel injection, because they already purchase fuel injected, ARB exhaust compliant, engine systems during the fabrication of their vehicles.

Table IV-7. Small Business Incremental Component Cost per Vehicle

Incremental Component Cost Per Vehicle – Small Business	
Component	**Incremental Cost***
2010$ Low Permeation Hose ($0.34 × 5.0 feet)	$2
2010$ Carbon Canister ($6.21 × 6)	$37
2010$ Low permeation fuel tank ($Aluminum - $Resin)	$225
2010$ Total Incremental Component Cost per Vehicle:	$264
2013$ Total Component Cost per Vehicle ($264*1.07):	**$282**

*Totals may not sum exactly due to rounding

2. Brand Unavailability/Market Shift

Some manufacturers do not produce vehicles in all OHRV categories. The brand choices for consumers of low volume OHRV models may be impacted due to the proposed regulations. Because of the high per unit costs of compliance, manufacturers of low volume models may decide not to sell that model in California. It is likely that other brands would step up to meet consumer demand, resulting in a shift in market share.

3. Reporting Costs

It is anticipated that OHRV manufacturers will incur costs associated with annual reporting. Staff determined a high and low estimate for annual reporting costs of OHRVs. The succeeding table depicts the estimated cost per business for the anticipated range of evaporative families.

Table IV-8. Summary of Estimated Reporting Costs

Number of Evaporative Families per Manufacturer	Staff Hours to Apply per Evaporative Family	Estimated Pay Rate ($ per hour)	Total Estimated Reporting Cost
2 - 8	10	$30	$600 – $2,400

G. IMPACT TO INDIVIDUAL CONSUMER

1. Direct Impact

The increased cost for evaporative control, testing, and certification costs per vehicle are expected to be from $216 to $465 which represent 4 to 9 percent of the retail cost of an OHRV (assuming an average cost of $5,000). It is anticipated that the increased cost will be reduced due to cost savings from fuel injection fuel efficiency and evaporative emission reductions over the lifetime of the OHRV (see Section IV.i Cost Savings).

2. Indirect Impact

Any OHRV manufacturer that sells an evaporative family with fewer than 150 units in California may experience high per-vehicle costs which could result in model unavailability. This may affect consumers who are expecting to purchase a particular model produced by a manufacturer who can longer support the costs. Staff expects that a manufacturer with higher sales volumes for that segment of OHRV will be available to provide a similar model to purchase.

H. IMPACT TO DEALERS

Most OHRV manufacturers sell their products through distributors and dealers, some of which are owned by manufacturers and some are independent. A potential indirect impact could be that dealers, distributors, or importers downsize their staff due to a decrease in OHRV sales associated with the increase in costs to control evaporative emissions from OHRVs. A retail price increase would be less noticeable for OHRV manufacturers that can more readily absorb fixed cost increases, such as manufacturers with high sales volumes or higher priced vehicles.

I. COST SAVINGS

1. Fuel Efficiency Savings

The stringency of the proposed diurnal standard is expected to speed-up the transition from carburetors to fuel injection. Standard carburetors produce evaporative emissions and do not optimize air/fuel ratios for all load/speed conditions, thereby reducing overall fuel efficiency of the engine. Electronic fuel injection (EFI) can reduce or eliminate these issues. Fuel injection uses an engine control unit, sensors, and electronic fuel injectors to optimize the air/fuel ratio and reduces evaporative emissions because the fuel management system is sealed and does not vent.

For engines subjected to transient loading, such as those used in OHRVs, switching from carbureted engines to EFI controlled engines can result in an increase in fuel efficiency. The cost savings get transferred on to the end user in the form of lower operating costs. However, fuel efficiency for an EFI controlled OHRV is very dependent on the fuel injection calibration. In some cases the potential for increased fuel economy may not be realized. In addition, the regulation does not specifically require EFI because the proposed diurnal standard is performance–based. Manufacturers may choose any technology to comply with the diurnal standard. This leads to an uncertainty in projecting future EFI OHRV sales. Based on the uncertainties, the cost savings from improved fuel injection engine efficiency were not included.

2. *Evaporative Control Savings*

The reduction of evaporative emissions from OHRVs from the proposed regulation will result in a decrease in fuel usage because less fuel will be lost due to evaporation. This reduction can be estimated as a fuel cost savings based on emission reductions. The cost savings is calculated from the sum of the emission reductions for each year and the corresponding value of retail gasoline for that year. The retail gas prices are obtained from a California Energy Commission report that determined the forecasted retail gas prices from 2011 to 2030 (CEC, 2011). All the prices were then converted from 2010 dollars to 2013 dollars with a factor of 7 percent using an inflation calculator provided by U.S. Department of Labor (USDL, 2013). Also, the prices were extrapolated from 2031 to 2038 using 0.7 percent increase.

a. Fuel Cost Savings per Year

$$FCSY = [IF\ X\ (RCG)\ \mathrm{X}\ ((\mathrm{ER}))] \div GD$$

Where,
FCSY = Fuel Cost Savings per Year
IF = Inflation Factor
RCG = Retail Cost of Gasoline
ER = Emissions Reduction
GD = Gasoline Density (6.073 lbs./US Gallons)

b. Fuel Offsets (Lifetime of Vehicle)

$$FO = \sum FCYS$$

Where,
FO = Fuel Offsets
FCSY = Fuel Cost Savings per Year

The estimated fuel cost savings over the lifetime of the vehicle is $52.71. This value reduced the incremental cost increase from the proposed evaporative controls.

J. ALTERNATIVES

1. *No Action*

Although maintaining the status quo has no cost, it offers no benefit. The "no action" alternative translates into deference to U.S. EPA tank and hose permeation standards, which provide an insufficient level of ROG reductions.

2. *Removal of the "Tip Test"*

The proposed regulation includes a requirement that OHRVs are equipped with emission controls to prevent fuel leakage in case of tip over. The effectiveness of these controls is determined with a tip test. Removal of the tip test from the proposed test procedure, *Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles* (TP-933) could prove counterproductive for the OHRV industry. Tip testing is essential to the prevention of carbon canister liquid contamination; and therefore, operation. If ARB's Enforcement Division conducted an in-use evaluation of OHRVs, and observed consistent carbon canister liquid contamination due to a manufacturer's failure to protect the carbon canister, the OHRV manufacturer would be compelled to absorb all costs associated with component redesign, product recalls, and enforcement penalties.

3. *Separate Standards for Each Mode of Use*

Requiring standards for each mode of evaporative emissions from OHRVs (running loss, hot soak, and diurnal) would increase a manufacturer's investment in evaporative testing enclosure or Sealed Housing for Evaporative Determination, SHED, time, and therefore overall fixed costs. The proposed regulation and test procedure emphasize diurnal testing and relegates hot soak and running loss to the preconditioning period.

V. SUMMARY

Based on industry costs, the proposed regulation is expected to be cost-effective over the entire fleet of OHRV. The proposed OHRV regulation has a low estimate value of $4.09 and a high estimate value $9.76 per pound of ROG reductions in 2035 with an average of $6.93 per pound. The proposed regulation maximizes cost-effectiveness by allowing flexibility for demonstrating compliance with the standards and by giving manufacturers flexibility in certification, which accommodates the diversity of vehicle types and testing capabilities. Manufacturers have full control in selecting emission control components and in determining the necessary design changes needed to produce a compliant OHRV. Staff collaborated with manufacturers and stakeholders to mitigate the cost impact by delaying the implementation model year to 2018 and permitting a flexible phase-in for OHRV compliance. These concessions provide additional time for new sales to recover and system redesign.

VI. REFERENCES

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VII. APPENDIX

Figure VII-1. ARB Cost Survey (Page 1)

State of California
Air Resources Board
MLD/ECCB-057 (01/2013 Updated)

Incremental Manufacturer Costs for Compliance with ARB's Proposed OHRV Evaporative Regulation and Test Procedures

January 2013

Assistance requested:
Air Resources Board (ARB) staff is proposing amendments to the evaporative emission standards for Off-Highway Recreational Vehicles (OHRV). A copy of the draft regulation and test procedure is posted on the ARB website: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm

OHRV Manufacturers are encouraged to complete the following table, as applicable, to estimate the incremental manufacturer cost associated with the draft proposed regulation and test procedure. Incremental manufacturer cost is the increase in cost, to the manufacturer (not retail price equivalent), of components associated with this proposed regulation (new component cost minus current component cost).

For questions, please contact Pippin Mader at (916) 322-8930 or by email pmader@arb.ca.gov.

Please provide responses by March 1, 2013.
Mail: ARB, MLD Fax: (916) 322-2444
Attn: Pippin Mader
P.O. Box 2815
Sacramento, CA 95812

Date:	**Treat source of information as confidential:** ☐ Yes ☐ No
Manufacturer Name:	Contact Name:
Telephone:	Email:
Contact Address:	
What is the average time, in model years, between evaporative family re-design?	
What percentage of your OHRVs are manufactured in California?	
Are cost estimates based on building "California only" or "50 state" OHRVs?	
Estimated retooling cost, if any, associated with the assembly process of OHRVs with low emissions technology:	

Figure VII-2. ARB Cost Survey (Page 2)

State of California
Air Resources Board
MLD/ECCB-057 (01/2013 Updated)

Incremental Manufacturer Costs for Compliance with ARB's Proposed OHRV Evaporative Regulation and Test Procedures

	OHRV Evaporative Family # (e.g. 1, 2, 3, ...)	Evaporative Family Displacement Range (cc)	Incremental Costs for Compliance with ARB's Proposed OHRV Evaporative Regulation and Test Procedures: Low Perm Fuel Hose ($incr Cost per vehicle)	Low Perm Fuel Tank ($incr Cost per vehicle)	Carbon Canister / Pressure Relief Valve ($incr Cost per vehicle)	Fuel Management ($incr Cost per vehicle)	Other Control Components* ($incr Cost per vehicle)	Re-Design resulting from this regulation** ($Cost per evaporative family)	Testing and Certification ($Cost per evaporative family)	Evaporative Family Size (Projected vehicle sales in California per evaporative family)
ATV Evaporative Families**	ATV Evap Evaporative Family #1									
	ATV Evap Evaporative Family #2									
	ATV Evap Evaporative Family #3									
Motorcycle Evaporative Families**	MC Evap Evaporative Family #1									
	MC Evap Evaporative Family #2									
	MC Evap Evaporative Family #3									
Side-by-Side vehicle Evaporative Families**	Side-by-Side vehicle Evaporative Family #1									
	Side-by-Side vehicle Evaporative Family #2									
Misc Evap families*	Other* (i.e. sand cars, etc.)									

* Please provide additional information as needed regarding "Other OHRV Categories", "Re-Design", or "Other Control Components".
** Add additional families as needed

Figure VII-3. ARB Cost Survey 2 (Page 1)

State of California
Air Resources Board
MLD/ECCB-057 (04/2013 Updated)

Treat source of information as confidential: ☐ Yes ☐ No

Updated Manufacturer Costs for Compliance with ARB's Proposed OHRV Evaporative Regulation and Test Procedures

April 2013

Assistance requested:
Air Resources Board (ARB) staff has recently made amendments to the proposed evaporative emission standards for Off-Highway Recreational Vehicles (OHRV) in an attempt to reduce the testing cost for manufacturers. Simplified versions of the regulation and test procedure are attached. They summarize the current draft regulation and test procedure posted on the ARB website: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm. The summary documents are not intended to replace any regulatory items, but merely serve as an aid when completing this form.

OHRV Manufacturers are encouraged to complete the following table, as applicable, to estimate the incremental and capital manufacturer costs in 2013 U.S. dollars ($) associated with the revised proposed draft regulation and test procedure. In order to integrate stakeholder cost estimates into the rulemaking support documents ARB staff must receive cost estimates no later than April 29, 2013.

Please return by April 29, 2013	
Mail: Pippin Mader, ARB/MLD P.O. Box 2815 Sacramento, CA 95812	
Fax: (916) 322-2444 Attn: P. Mader	Email: pmader@arb.ca.gov

Manufacturer Information:
Manufacturer Name: ______________________

Contact Name: ______________ Telephone: ____________ Email: ______________

Vehicle Production:
What is the average time, in model years, between evaporative family re-design? ______________

What percentage of your current California OHRV fleet already meets the proposed standards? ____________

Do you currently manufacture zero emission OHRVs?: ☐ yes ☐ no What percent of California fleet? % ________

Do you sell less than 50 OHRV units in California per model year? ______________

For questions, please contact Pippin Mader at (916) 322-8930 or by email pmader@arb.ca.gov.

Figure VII-4. ARB Cost Survey 2 (Page 2)

State of California
Air Resources Board
MLD/ECCB-057 (04/2013 Updated)

The cost estimates in 2013$ provided below are based on building OHRVs designed to comply with ARB's proposed evaporative standards.
These vehicles will be distributed to the following market: ☐California only ☐50 state

	Instructions: Estimate the cost increase per model year to design current CA compliant vehicles to meet the proposed OHRV evaporative standards. Rows can be added, as needed, to accommodate additional evaporative families.									
	Evaporative Family Displacement Range (cc)	$ Incremental Costs per *Vehicle* (cost of equipment needed to meet the proposed standards)					$ Capital Costs per *Evaporative Family Life*		MY2018 Projected Vehicle Sales in California per *Evaporative Family*
		Reduced Permeation Fuel Hose[1]	Reduced Permeation Fuel Tank[1]	Carbon Canister / Pressure Relief Valve	Fuel Management	Other Control Components[2]	Vehicle Re-Design[2]	Testing and Certification	
Example	ATV 51cc – 249cc	$2.5	$5.00	$20.00	$150.00	$2.50	$100,000.00	$50,000.00	5000
ATV Evaporative Families									
Motorcycle Evaporative Families									
Misc. Evap families									

[1] A cost should only be estimated for the fuel hose/tank if a lower permeation is needed to meet the standard beyond current federal evaporative requirements.
[2] Please provide an estimate and description of any additional costs incurred by designing vehicles to comply with the proposed evaporative standards.

For questions, please contact Pippin Mader at (916) 322-8930 or by email pmader@arb.ca.gov.

Figure VII-5. ARB Cost Survey 2 (Page 3)

State of California
Air Resources Board
Attachment 1 of 2 to MLD/ECCB-057 (04/2013 Updated)

Short Summary of the OHRV Evaporative Emission Regulation*

Applicability- [§2418(a)]
Applies to Off-highway recreational vehicles (OHRV) including gasoline fueled off-road motorcycles, all-terrain vehicles, off-road sport vehicles, off-road utility vehicles, and sand cars. Zero emission OHRV may be certified to receive credits, but are not required to perform testing.

Phase-in Period [§2418(b)(2)]
Phased-in over a four year period beginning in model year 2018 using the following calculation: [(MY2018+MY2019+MY2020+MY2021)/4 X100]≥75%

Evaporative Emission Performance Standards [§2418(b)(1)(A)]
OHRV must meet a 1.0 g TOG diurnal standard (per test sequence) and have no visible liquid leakage during a fuel system leakage tip test. The diurnal standard can be demonstrated by performing one of the two following tests:

1. 72 hour diurnal
2. 24 hour diurnal plus calculated vented emissions (option includes a pressure relief valve exemption)

All-Terrain Vehicle Filler Neck Compatibility Standard [§2418(b)(1)(B)]
All-terrain vehicles with fuel tanks that are re-designed beginning in model year 2018, with a nominal capacity of greater than 3.5 gallons must meet filler pipe sealing surface requirements of Figure 1 of the International Standards Organization 13331:1995(E).

Small-Volume Manufacturer Evaporative Emission Design Standard [§2418(c)]
OHRV manufacturers that produce less than 50 vehicles per year for three consecutive calendar years may certify using design-based standards. OHRV must have fuel injection and an actively purged carbon canister with a 1.0 g/l working capacity, perform a tip-test, and meet permeation standards for the fuel tank (1.5 g/m^2/day @ 28°C (82°F)) and fuel hose (5.0 g/m^2/day @ 35°C (95°F)).

Advanced Fuel System Credits [§2418(f)]
An OHRV manufacturer may use credits generated from certification values that are below the applicable performance standard, or from zero emission OHRV to offset higher emitting evaporative families. Zero emission vehicles are awarded credits in the amount of 75% of the diurnal standard. All credits must be used in the same model year, may not be sold or traded, and cannot be used for evaporative families that emit over 300% of the performance standard.

Warranty Period [§ 2419.2]
The warranty period covers a period of use over 30 months, or 2500 miles, or 250 hours, whichever comes first, except for evaporative components over $200 including labor, which are covered for 60 months, or 5000 miles, or 500 hours.

Tampering [§ 2419.5(f)]
All evaporative emission control systems must be installed in such a way that they are resistant to tampering or removal. All off-road motorcycles with carbon canisters installed outside of the cross sectional profile, or clearly visible on all other OHRVs, must be mounted so that non-conventional tools are required to remove the canister and the vapor line connection to the canister.

* Not intended to replace the proposed OHRV regulatory documents posted: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm

Figure VII-6. ARB Cost Survey 2 (Page 4)

State of California
Air Resources Board
Attachment 2 of 2 to MLD/ECCB-057 (04/2013 Updated)

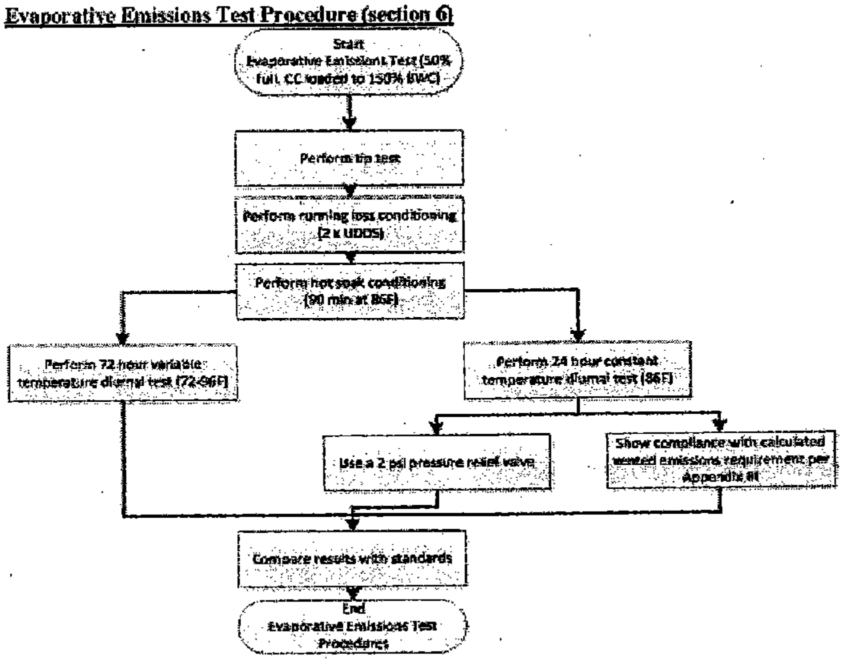
Short Summary of TP-933 - Test Procedure for Determining Evaporative Emissions from Off-Highway Recreational Vehicles*

<u>**Overview**</u>
TP-933 is a test procedure that is used to measure diurnal evaporative emissions from Off-highway recreational vehicles (OHRV).

<u>**Durability Testing (section 4)**</u>
Vehicle must show the evaporative emissions components are durable enough to control emissions for their full useful life. This includes remaining mechanically intact in environments with dust, vibration, heat, UV, and ozone. This also includes protecting the carbon canister from contamination by liquid fuel

<u>**Evaporative Emissions System Preconditioning (section 5)**</u>
All fuel system components that permeate must be soaked for the equivalent of 3,360 hours at a temperature between 68°F and 86°F. The carbon canister has to be conditioned and loaded to 1.5 times the nominal butane working capacity before the test.

<u>**Evaporative Emissions Test Procedure (section 6)**</u>



<u>**Appendix**</u>
Appendix A – Calculations: Evaporative Emissions
Appendix B - Calculation Method for demonstrating the adequacies of the Vented Evaporative Emissions system
Appendix C – Motorcycle Variable Speed Cooling Blower

* Not intended to replace the proposed OHRV regulatory documents posted: <u>http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm.</u>

Figure VII-7. ARB Cost Survey 2010 (Page 1)

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

August 3, 2010

Dear Sir/Madam:

The purpose of this letter is to request participation in the enclosed evaporative emission control components surveys.

The Air Resources Board (ARB) is proposing amendments to the evaporative emission standards for Off-Highway Recreational Vehicles and On-Road Motorcycles. ARB staff requests an estimate of the increased costs of control components that manufacturers may use to meet the ARB standards and specifications as listed in the cost survey form. This information will be used for cost and impact analysis for the proposed regulation.

We realize that any information you provide may be proprietary. We will keep the source of the information confidential if you check the confidentiality box located in the upper right corner of the survey form. Any confidential or proprietary information submitted will be handled in accordance with California Code of Regulations, title 17, section 91000, which specifies the requirements for handling confidential information submitted to public agencies.

Please assist us with our cost survey by completing the enclosed forms and returning them **by September 15, 2010.** We appreciate your participation.

If you have any questions regarding this request, please contact Pippin Mader (916) 322-8930 or via email at pmader@arb.ca.gov, or contact Michele Dunlop at (916) 323-8971 or via email at mdunlop@arb.ca.gov.

Sincerely,

Pippin Mader

Pippin Mader P.E.
Evaporative Control, Engineering, and Regulatory Development Section
Monitoring and Laboratory Division

Enclosures (2)

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

California Environmental Protection Agency

Printed on Recycled Paper

Figure VII-8. ARB Cost Survey 2010 (Page 2)

State of California
Air Resources Board
MLD/ECCB-057 (08/10 New)

Treat source of information as confidential ☐ Yes ☐ No

Component Cost Survey for Evaporative Emission Controls on Off-Highway Recreational Vehicles

Assistance requested: The Air Resources Board (ARB) is proposing amendments to the evaporative emission standards for Off-Highway Recreational Vehicles (OHRV), and ARB staff anticipates that manufacturers will equip their vehicles with evaporative control components that meet the specifications as listed below in the survey table. Where applicable, please provide the costs of the control components that meet the specifications as listed.

Manufacturer Name:	Contact Address:	Date:
Contact Name:	Contact Telephone: Contact E-mail:	Manufacturing Locations:

Component Type	Off-Highway Recreational Vehicle Evaporative Emission Components			OHRV Manufacturer's Cost*	
	Current Specification	Requested Specification	Size	Current Specification	Requested Specification
Fuel Hose (Permeation)	15 grams / m^2 / day at 23 °C	5 grams / m^2 / day at 40 °C	3/16" internal diameter	$ / foot	$ / foot
			1/4" internal diameter	$ / foot	$ / foot
			5/16" internal diameter	$ / foot	$ / foot
Fuel Tank (Permeation)	1.5 grams / m^2 / day at 28 °C	1.5 grams / m^2 / day at 40 °C	2.5 gallons	$	$
			4.0 gallons	$	$
			5.0 gallons	$	$
Carbon Canister	None	~9.5 gram BWC	2.5 gallons (9.46 liters)	$	$
		~15 gram BWC	4.0 gallons (15.14 liters)	$	$
		~19 gram BWC	5.0 gallons (18.93 liters)	$	$
Pressure Relief Valve	None	2.00 psi	All tank sizes	$	$
	None	2.25 psi	All tank sizes	$	$
Fuel Management	Carburetor	Fuel Injection	None	$	$

Note: * **OHRV Manufacturer's Cost** is the price component manufacturers will charge when they sell to OHRV manufacturers.

OVER

Figure VII-9. ARB Cost Survey 2010 (Page 3)

State of California
Air Resources Board
MLD/ECCB-057 (08/10 New)

Please feel free to attach additional pages to this document in order to accurately describe the increased costs for the proposed regulation.

We appreciate your participation. If you have any questions regarding this request, please contact Pippin Mader (916) 322-8930 or via email at pmader@arb.ca.gov, or contact Michele Dunlop at (916) 323-8971 or via email at mdunlop@arb.ca.gov.

Please return this survey by September 15, 2010

Mail to: Pippin Mader, ARB/MLD
P.O. Box 2815
Sacramento, CA 95812

Fax to: (916) 322-2444
ATTN: Pippin Mader ARB/MLD

Email to: pmader@arb.ca.gov

Attachment E:

Public Process for Development of Proposed Action Information

May 2013

California Air Resources Board

Monitoring and Laboratory Division

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TABLE OF CONTENTS

I. Introduction 1
II. Workshops 2
  A. March 23, 2006 2
  B. September 6, 2006 10
  C. April 20, 2010 12
  D. December 18, 2012 15

LIST OF TABLES

Table I-1: OHRV Workshop Locations and Dates 1
Table I-2: Meetings with Industry to Discuss OHRV Regulatory Proposal 1

LIST OF FIGURES

Figure II-1: March 23, 2006 Workshop Notice 3
Figure II-2: March 23, 2006 OHRV Workshop Action Items...9
Figure II-3: September 6, 2006 Workshop Notice...10
Figure II-4: April 20, 2010 Workshop Notice 12
Figure II-5: April 20,2010 Stakeholder Comments 14
Figure II-6: December 18, 2012 Workshop Notice...16
Figure II-7: Action Items Resulting from December 18, 2012 Workshop 18

I. INTRODUCTION

Public participation is one of the cornerstones of the regulation development process. In an effort to encourage input and feedback from parties directly or indirectly affected by the Air Resources Board's (ARB) proposed Off-Highway Recreational Vehicles (OHRV) regulation, staff developed an informational website featuring a portal through which interested parties provided contact information for updates and notices of public workshops. For stakeholders unaware of ARB's electronic notification features, staff mailed workshop notices via the United States (U.S.) Postal Service for the first workshop. Over the course of the regulation development process, staff conducted four workshops at the dates and times listed in Table I-1.

Table I-1: OHRV Workshop Locations and Dates

LOCATION	DATE
El Monte	3/24/2006
Sacramento	9/6/2006
El Monte	4/20/2010
El Monte	12/18/2012

In addition to workshops, nearly forty stakeholder meetings have been held on all aspects of the regulatory proposal. Dates and participants are listed in Table I-2.

Table I-2: Meetings with Industry to Discuss OHRV Regulatory Proposal

PARTICIPANTS	DATES
Motorcycle Industry Council (MIC) and OHRV Manufacturers	1/14/2009, 1/15/2009, 4/7/2010, 4/29/2010, 7/21/2010, 9/30/2010, 11/8/2010, 11/9/2010, 11/7/2011, 3/22/2011, 4/27/2011, 8/18/2011, 9/26/2011, 3/5/2012, 4/17/2012, 4/25/2012, 10/17/2012, 3/6/2013, 3/25/2013, 4/4/2013, 4/12/2013
United States Environmental Protection Agency (U.S. EPA)	3/14/2013
Harley Davidson	8/26/2010, 9/27/2011, 11/7/2011, 5/4/2012,12/18/2012, 2/25/2013, 3/14/2013
MeadWestvaco	7/15/2009, 12/2/2009, 5/3/2011, 9/18/2012
Honda	11/2/2010, 11/9/2010, 3/27/2013
Evaporative Emissions Consulting Inc.	11/9/2009, 2/8/2010, 2/9/2010

Workshop notices and comments are provided in the pages that follow.

II. WORKSHOPS

The section presents the OHRV workshops that staff held to inform OHRV and On-Road Motorcycle (OMC) manufacturers, stakeholders, and interested parties about the proposed regulation and test procedures for OHRVs.

A. MARCH 23, 2006

On March 23, 2006, staff informed stakeholders of their intent to develop more comprehensive evaporative emissions regulation. Staff held a joint workshop to discuss ARB's proposal to harmonize with the U.S. EPA's evaporative standards for all-terrain vehicles and off-road motorcycles and to take comment on proposed changes to the non-certified OHRV riding season (Figure II-1). Based on comments received from the workshop, a list of action items were drafted by staff (Figure II-2).

Figure II-1: March 23, 2006 Workshop Notice

Alan C. Lloyd, Ph.D.
Agency Secretary

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
9480 Telstar Avenue, Suite 4
El Monte, California 91731 www.arb.ca.gov

Arnold Schwarzenegger
Governor

TO: ALL OFF-HIGHWAY RECREATIONAL VEHICLE MANUFACTURERS
ALL INTERESTED PARTIES

SUBJECT: PUBLIC WORKSHOP TO DISCUSS AMENDMENTS TO THE OFF-HIGHWAY RECREATIONAL VEHICLE REGULATIONS (OHRV)

The California Air Resources Board (ARB or Board) staff invites you to participate in a public workshop to discuss amendments to the OHRV regulations. The OHRV regulations can be found in title 13, California Code of Regulations, sections 2410-2415. Later this year, staff plans to propose to the Board interim evaporative standards for off-road motorcycles (ORMs) and all-terrain vehicles (ATVs), which will include permeation standards for fuel tanks and fuel hoses. Staff shall also propose minor changes to the riding seasons (section 2415) that reflect current air quality data and make the riding season dates more uniform by location.

Background

California has had a longstanding off-highway vehicle program, which supports the off-highway enthusiast community and is funded, in part, by registration fees. Statewide, approximately 100 riding areas on public lands have been designated for ORM and ATV use. In January 1994, the Board approved the OHRV regulations, which contained exhaust emission standards for ORMs and ATVs. Once implemented, only emission-compliant ORMs and ATVs were eligible for off-highway registration, commonly known as the "Green Sticker." Noncompliant ORMs and ATVs were still allowed to be sold in California, but it was anticipated that their use would be limited to closed course racing events.

The OHRV regulations were amended in 1998, in response to concerns about product availability. Specifically, the numbers of emission-compliant models were lower than originally anticipated, which would have had an unintended and negative impact on dealers. To remedy this situation, the amendments established a new form of registration for which the noncompliant 1998 and subsequent model year ORMs and ATVs were eligible, known as the "Red Sticker." Also established were riding seasons for these noncompliant ORMs and ATVs, which specified when these vehicles could operate; namely, when ozone levels did not exceed ambient air standards.

In 2003, the OHRV regulations were amended a second time. Because there had been errors made when OHV registrations were issued (e.g., Green Sticker registration issued to noncompliant vehicles), enforcing the riding seasons became problematic. After the problems causing the registration errors had been corrected, the OHRV regulations were then amended to move forward the Red Sticker registration requirement for noncompliant vehicles from 1998 to the 2003 model year and subsequent.

Initially, only California had emission standards for ORMs and ATVs. It wasn't until November 2002, that the United States Environmental Protection Agency (U.S. EPA) promulgated regulations for these vehicles in their Nonroad Recreational Vehicles and Engines rulemaking. This rulemaking included exhaust and evaporative standards for ORMs and ATVs. The exhaust standards are phased-in over the 2006 to 2007 time frame. The evaporative standards will be fully implemented in 2008.

Staff Proposal

Following the U.S. EPA rulemaking, industry contacted ARB staff requesting harmonization with certain and/or all parts of the federal regulations for ORMs and ATVs. At the workshop, ARB staff will present an overview of the prominent regulatory issues as they are currently understood, and some of the options available for addressing them. The primary issues are:

I. Evaporative Standards

Currently, the OHRV regulations do not contain evaporative emission standards. At this time, ARB is developing a staff proposal, more stringent than federal standards, to control additional evaporative emissions from the category. At the workshop, staff will present an overview of ARB's efforts to develop new evaporative emission standards. A formal staff proposal is scheduled to be presented to the Board in 2008. In the interim, ARB staff plans to propose harmonizing with the federal standards and test procedures for permeation of fuel tanks and fuel hoses on ORMs and ATVs. The standards, which will be implemented in 2008, are:

- Fuel Tanks: 1.5 grams per square-meter per day
- Fuel Hoses: 15.0 grams per square-meter per day

II. Exhaust Standards

The federal regulations have one set of standards for ORMs and another set of standards for ATVs; whereas California has one set of standards for both. The tables below compare them:

Table 1. ORM Standards
(grams per kilometer)

	HC	$HC+NO_x$	CO
California	1.2	—	15.0
Federal	—	2.0	25.0

Table 2. ATV Standards
(grams per kilometer)

	HC	$HC+NO_x$	CO
California	1.2	—	15.0
Federal	—	1.5	35.0

- The OHRV regulations contain exhaust standards for hydrocarbon (HC) and carbon monoxide (CO) emissions. The federal regulations differ: oxides of nitrogen (NO_x) emissions are added to the HC emissions, resulting in a $HC+NO_x$ standard. The federal standards for CO emissions are less stringent than California's. Because the federal standards are less stringent, staff is reluctant to consider harmonizing.

- Additionally, the federal regulation also differs with its provisions for the certification of ORMs with engine displacements less than 70 cubic centimeters (cc) and ATVs with engine displacements less than 100 cc. The standards for these classes of vehicles are even less stringent. The effect of harmonization would result in less emission reductions for California.

Table 3. Federal Standards for Small Displacement OHRV Engines
(grams per kilowatt-hour)

Vehicle Type / Displacement	HC	$HC+NO_x$	CO
ORMs: ≤ 70 cc	—	16.1	519
ATVs: ≤ 99 cc		25.0	500

- Both the California and the federal regulations allow an optional "engine only" certification test for ATVs, as opposed to the chassis dynamometer test for ORMs, with comparable standards measured in grams per kilowatt-hour. In California, "specialty/utility" vehicles must certify to the off-road large spark-ignition (LSI) standards. These vehicles are similar to golf carts, with bench seats and steering wheels, but have rear cargo areas with carrying capacities of several hundred pounds. However, there is a provision in the federal regulations allowing specialty/utility vehicles to certify under the ATV standards. Although the ATV and LSI standards in California are somewhat similar at present, staff is evaluating more stringent LSI standards. Therefore, harmonizing with the federal provision poses a potential loss of emission reductions in the future.

Table 4. ATV vs. LSI Standards – Engine Dynamometer Test
(grams per kilowatt-hour)

Vehicle Type / Displacement	HC	$HC+NO_x$	CO
ATV: California: ≥ 225 cc	—	13.4	400
ATV: Federal: ≥ 225 cc	—	13.4	400
LSI: < 1-liter	—	12.0	549

Riding Seasons

When the riding seasons were first determined in 1998, ozone readings from monitoring stations were analyzed over the three-year period of 1995-1997. Staff has reviewed more recent ozone data (2002-2004) and will propose minor changes to the riding seasons based on these data. Staff has also discussed enforcement concerns with the land agencies that have jurisdiction over these lands. In cases where riding areas with different riding seasons border with one another or there are trails that connect the two, staff will propose minor changes that make the riding seasons more uniform. An example of neighboring riding areas would be the Hungry Valley State Vehicular Recreation Area and Alamo Mountain, in the Mount Pinos Ranger District. The effect of this will be to increase riding opportunities slightly, and simplify matters for off-highway enthusiasts and land-use managers.

Workshop

The workshop will be held at the following time and location:

Date:	March 23, 2006
Time:	9:00 a.m. to 3:00 p.m.
Location:	Air Resources Board – Annex 4 Auditorium 9530 Telstar Avenue El Monte, California 91731

Workshop Materials

Workshop presentations and handout will be available at the workshop and on the Off-Road Recreational Vehicles website at: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm . If you would like to receive notification by email of updates to the Off-Road Recreational Vehicles website, please sign up at http://www.arb.ca.gov/listserv/orrec.htm .

If you have a disability-related accommodation need, please go to http://www.arb.ca.gov/html/ada/ada.htm for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please go to http://www.arb.ca.gov/as/eeo/languageaccess.htm or contact the Bilingual Coordinator at (916) 324-5049.

We welcome your participation. If you have general questions regarding either the workshop or the proposed OHRV rulemaking, or you cannot attend and would like to provide comments, please contact Mr. Andrew Spencer, Air Pollution Specialist at (626) 575-6675 or aspencer@arb.ca.gov, or Mr. Scott Rowland, Manager at (626) 575-6676 or srowland@arb.ca.gov. For questions or comments regarding the development of California's new evaporative emission standards for ORMs and ATVs, please contact Mr. Pippin Mader, Air Resources Engineer at (916) 322-8930 or pmader@arb.ca.gov, or Mr. James Watson, Manager at (916) 327-1282 jwatson@arb.ca.gov.

Sincerely,
/s/

Robert H. Cross, Chief
Mobile Source Control Division

cc: See next page

cc: Mr. Tom Cackette
Chief Deputy Executive Officer

Mr. William Loscutoff, Division Chief
Monitoring and Laboratory Division

Mr. Michael W. Carter, Chief
Emission Research and Regulatory Development Branch

Mr. Manjit Ahuja, Chief
Stationary Source Testing Branch

Mr. Scott Rowland, Manager
Off-Road Controls Section

Mr. Andrew Spencer, Air Pollution Specialist
Off-Road Controls Section

Figure II-2: March 23, 2006 OHRV Workshop Action Items

March 27, 2006

Off Highway Recreational Vehicle Workshop

Action Items:

- Larry Keller from Polaris asked that the ARB consider cost impacts and industry size on smaller snowmobile manufacturers when proposing the rulemaking.
- Chris Wright from Arctic Cat requested that the ARB consider the location and activity of snowmobiles.
- Bob Wyman from Latham and Watkins suggested that the ARB take into consideration that snowmobiles will not be refueled as often as other equipment.
- Jim Lyons requested the calculations ARB used to generate the pie charts.
- Jeff Shetler from Kawasaki asked whether ARB would be testing representative equipment, (specifically a representative number of red sticker vehicles). He also suggested that consumers would tamper with equipment installed to reduce evaporative emissions in an attempt to increase performance. Jeff asked the ARB if the low permeation tank data was generated using new tanks or tanks after their useful life.
- Alex Kennedy from Polaris asked the ARB to expand on what fell into the carburetor and other emissions category on the pie charts.
- Steve Whitehead from Fluoro-Seal asked if the ARB would be harmonizing its test procedures and test fuels with the EPA standards.
- Yasuto Nakata from Honda had concerns with the cost of conducting running loss control tests in a shed.

B. SEPTEMBER 6, 2006

A workshop was held on September 6, 2006 for stakeholders to comment on a proposed test plan to develop inventory emission factors and evaluate control technology for OHRVs (Figure II-3).

Figure II-3: September 6, 2006 Workshop Notice

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

August 8, 2006

To: All Off-Highway Recreational Vehicle Manufacturers and All Interested Parties:

The California Air Resources Board (ARB) staff invites you to participate in a public workshop to discuss a test plan to develop inventory emission factors and evaluate technology to control evaporative emissions from Off-Highway Recreational Vehicles (OHRVs).

The workshop will be held at the following time and location:

Date:	September 6, 2006
Time:	10:00 a.m. to 12:00 p.m.
Location:	Air Resources Board North and South Conference Room 1927 13th Street Sacramento, California 95814

Test Plan Evaluation

Please download and evaluate the OHRV test plan that can be found on the OHRV website at: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm. Please be prepared to discuss comments on the test plan at the workshop.

Copies of the workshop presentation and test plan will be available at the workshop. If you would like to receive notification by email of updates to the Off-Road Recreational Vehicles website, please sign up at http://www.arb.ca.gov/listserv/orrec.htm

If you have a disability-related accommodation need, please go to http://www.arb.ca.gov/html/ada/ada.htm for assistance, or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please go to http://www.arb.ca.gov/as/eeo/languageaccess.htm or contact the Bilingual Coordinator at (916) 324-5049.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

California Environmental Protection Agency

Printed on Recycled Paper

We welcome your participation. If you have questions or comments regarding the OHRV test plan please contact Mr. Pippin Mader, Air Resources Engineer at (916) 322-8930 or pmader@arb.ca.gov, or Mr. James Watson, Manager at (916) 327-1282 or jwatson@arb.ca.gov.

Sincerely,

Manjit Ahuja, Chief
Stationary Source Testing Branch
Monitoring and Laboratory Division

cc: Mr. Scott Rowland, Manager
Off-Road Controls Section
Mobile Source Control Division

C. APRIL 20, 2010

On April 20, 2010, staff held a public workshop for OHRV and OMC manufacturers and interested parties to discuss the draft proposal to regulate evaporative emissions from OHRVS and OMCs (Figure II-4). Staff presented the details of the draft proposal and discussed issues raised by stakeholders. Comments developed by industry were provided to staff prior to the workshop (Figure II-5).

Figure II-4: April 20, 2010 Workshop Notice

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

April 1, 2010

To: All Off-Highway Recreational Vehicle and On-road Motorcycle Manufacturers and All Interested Parties:

The California Air Resources Board (ARB) staff invites you to participate in a public workshop to discuss a draft proposal to regulate evaporative emissions from Off-Highway Recreational Vehicles (OHRVs) and On-road Motorcycles.

The workshop will be held at the following time and location:

Date:	April 20, 2010
Time:	1:00 p.m. to 4:00 p.m.
Location:	Air Resources Board Annex 4 Conference Room 9500 Telstar Avenue El Monte, California 91731

Draft Regulation Evaluation

An overview of the draft proposal can be found on the OHRV website at: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm. The workshop presentation will also be posted on the OHRV website one day prior to the workshop. If you would like to receive notification by email of updates to the OHRV website, please sign up at http://www.arb.ca.gov/listserv/orrec.htm.

Copies of the workshop presentation and the overview of the draft proposal will be available at the workshop. Please be prepared to discuss the draft proposal at the workshop.

If you require a special accommodation or need this document in an alternate format (i.e. Braille, large print) or another language, please contact Pippin Mader at 916-322-8930 or pmader@arb.ca.gov as soon as possible, but no later than 10 business days before the scheduled event/meeting. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

California Environmental Protection Agency

Printed on Recycled Paper

We welcome your participation. If you have questions please contact Mr. Pippin Mader, Air Resources Engineer at (916) 322-8930 or pmader@arb.ca.gov, or Mr. James Watson, Manager at (916) 327-1282 or jwatson@arb.ca.gov.

Sincerely,

/s/

Manjit Ahuja, Chief
Evaporative Controls and Certification Branch
Monitoring and Laboratory Division

Figure II-5: April 20, 2010 Stakeholder Comments

Off-Highway Recreational Vehicle and On-Road Motorcycle Regulation Workshop

April 20, 2010

Stakeholder Comments

Proposal

Daniel Bak – Flyscooters

- What is the time frame on getting ARB approval/disapproval of a certification application once the application has been received by ARB?
  - The timing is variable and depends on several different factors. If no confirmatory testing is required and the application is complete and provides adequate tamper resistance then a manufacturer could receive a response from ARB in 2 – 3 months.

Steve Scholten – John Deere

- What is the vapor recovery test procedure based on?
  - This test procedure is based on the current federal procedure with minor changes to temperature and refueling flow rate.
- Will SHED testing be required far all vehicles?
  - Yes.

Joe Biber – Harley Davidson

- Please describe the running loss test procedure.
  - There will be a hose coming into the SHED to provide fresh air and also a hose going out to take out all of the exhaust emissions. The vehicle will be put on a portable dyno and run under a load for 23 minutes at 95° F. The emissions will be recorded at the end of the 23 minutes.
- Is any other running loss test procedure being considered?
  - ARB has requested that industry present an alternative running loss procedure that will show that the fuel does not boil and the carbureted system can control running loss.

Mark Carloch – Sierra Research

- What was the cost to ARB to perform the running loss test as currently described in the proposal?
  - ARB already had the SHED so the additional cost for the dyno and load were approximately $35,000.

D. DECEMBER 18, 2012

On December 18, 2012, staff conducted a workshop for stakeholders and industry to discuss a revised proposal to regulate evaporative emissions from OHRVs (Figure II-6). The discussion also included draft test procedures and updates to the emissions inventory. Based on the discussions that occurred during the workshop, staff developed a list of action items to incorporate industry recommended changes (Figure II- 7).

Figure II-6: December 18, 2012 Workshop Notice

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

December 4, 2012

To: All Off-Highway Recreational Vehicle Manufacturers and Interested Parties

The California Air Resources Board (ARB) staff invites you to participate in a public workshop to discuss a draft proposal to regulate evaporative emissions from Off-Highway Recreational Vehicles (OHRVs). The workshop will also include a discussion of draft test procedures and updates to the emissions inventory.

The workshop will be held at the following time and location:

Date:	December 18, 2012
Time:	10:00 a.m. to 2:00 p.m.
Location:	Air Resources Board Annex 4 Conference Room 9500 Telstar Avenue El Monte, California 91731
Teleconference Number:	1-866-803-4254 Passcode: 2568297

OHRV Draft Regulation and Test Procedures

Draft regulations and test procedures can be found on the OHRV website at: http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm. The workshop presentation will also be posted on the OHRV website one day prior to the workshop. If you would like to receive notification by email of updates to the OHRV website, please sign up at http://www.arb.ca.gov/listserv/orrec.htm

If you are unable to attend in person you may attend via phone and internet. A GoToMeeting has been setup to be used in conjunction with the teleconference number. You can attend the GoToMeeting by clicking on the following link on the day of the meeting: https://www1.gotomeeting.com/register/840392288

Copies of the workshop presentation, draft regulations, and test procedures will be available at the workshop. Please be prepared to discuss these at the workshop.

If you require a special accommodation or need this document in an alternate format (i.e. Braille, large print) or another language, please contact Pippin Mader (see below) as soon as possible, but no later than 10 days before the scheduled event/meeting. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

We welcome your participation. If you have questions please contact Mr. Pippin Mader, Air Resources Engineer at (916) 322-8930 or pmader@arb.ca.gov, or Mr. James Watson, Manager at (916) 327-1282 or jwatson@arb.ca.gov.

Sincerely,

\s\

Manjit Ahuja, Chief
Evaporative Controls and Certification Branch
Monitoring and Laboratory Division

Figure II-7: Action Items Resulting from December 18, 2012 Workshop

December 18, 2012
OHRV Workshop- El Monte, Ca

Comments from Workshop Participants

ARB PRESENTATION

TEST PROCEDURE QUESTIONS

- Industry: Does the tip test only apply to ATVs and not other four wheel vehicles? Can the test allow for different angles based on vehicle type?
    - ARB- Four-wheel vehicles are all being categorized as ATV. If it becomes necessary we can talk about modifying the tip test to allow for different angles by category.
    - Action Item (ARB): Review tip test applicability for different categories.
- Industry: The latest draft of the test procedure is only has the tip test being performed at side angles.
    - ARB- That is a mistake; the point of the test is to test the extremes of real use.
    - Action Item (ARB): Update test procedure for clarity.
- Industry: How was 2psi selected and what was the basis of that?
    - ARB- It was the number similarly effective for a 7-day test on the carbon canister. Based on the average headspace in the tank, RVP in the fuel, 76° F/ 92° F diurnal profile.

COST SURVEY QUESTIONS

- Industry: What are you doing with the cost information?
    - ARB- It will be used to determine the cost information, and estimate the cost of emission reductions.
- Industry: Is this confidential?
    - ARB- Yes, just check the box. If you are not comfortable with a certain number a range will work.
- Industry: If you do not have a category would the vehicle than fit in other?
    - ARB- Yes, we will clarify that.
    - Action Item (ARB): Clarify what to use the "other" category for on cost survey

PTSD SLIDES

- Industry: Did you make an assumption for ages based on the DMV data?
    - ARB- Yes, I believe it is 50 years. Before 2007 we did not have such detailed information on these vehicles, it is based on DMV data. Some people have held on to these vehicles for 30 years. Year one is not the highest, sales increase during the second or third year. Data shows that people have and use their OHRV for 30-40 years.
- Industry: How do you determine if the vehicle is in-use? Just assume it is if the vehicle is registered? We found that people have registered vehicles sitting in garages that are not used.
    - ARB- Yes, we assume that the vehicles registered are used. We have data showing that the number of vehicles registered and unused is

very small. I can show you this data. Cal state information shows the same data.

  - Action Item (MIC) - Provide data that shows a shorter life for OHRV, as claimed.

MIC PRESENTATION

FILLER NECK COMPATIBILITY

- Industry: Proposed an increasing standard from vehicles with 2.5 gallon tank to 3.5 gallon tank. This will encompass larger vehicles that need this technology. The fill pipe would have to meet the same requirements in Figure 1 in ISO 13331:1995 (E).
  - ARB- This is a reasonable request. Pamela shared the fraction of ATV under 2.5 gallons and this was around 85%.
  - Action Item (MIC): Provide figure and reasoning for requested change.
  - Action Item (ARB): Look at figure to verify that it only includes angles and nothing more, we do not want additional requirements for the filler neck the figure may describe.

TIP TEST

- Industry: We do not intend to test to such extreme angles. There are inconsistencies in numbering and references
  - ARB- This should be changed, this is just an error in updating.
  - Action Item (ARB): Update with correct angles.

AVERAGING

- Industry: The credits given should be similar to corporate averaging, we are amenable to having an upper limit. We can propose a number for the upper limit
  - ARB- We do not want to see uncontrolled vehicles allowed because than usage becomes an issue.
  - Action Item (MIC): Propose a number for the upper limit on averaging.
  - Action Item (ARB): Review item internally.

VEHICLE TAG

- Industry: We would like the tag to be placed on the outside of the owners manual
  - Action Item (ARB) - Discuss the requirements for the tampering label. Considering allowing tag to be placed in one of two areas: printed on front cover of owner's manual or a hanging tag, as currently described.

INSPECTION

- Industry: Dealers should not cause a manufacturers EO to be revoked
  - Action Item (ARB) - We agree that this does not seem necessary but will speak with enforcement to determine the reasoning between adding this language to 13 CCR 2769 in 2004.

WARRANTY

- Industry: There is a 5-year warranty without use limits. There should be a mileage limit but there are not odometers on all vehicles therefore a 30 month warranty is desired.

- ARB- Our model originally predicted the half-life of the vehicle to be 5 years, but new data from PTSD is significantly higher. We are not proposing the warranty to increase but will need to look at this further.
- Action Item (ARB): Determine warranty mileage limit.

PRECONDITIONING

- Industry: We would like to propose a standard for higher temperature aging.
  - ARB- There has been discussion with stakeholders and we will consider the uses in different vehicles.
  - Action Item (MIC): Send proposal to ARB for consideration.

DURABILITY TESTING

- Industry: We would like to remove the requirement to complete durability testing for a component that has already passed durability tests for other vehicles
  - Action Item (ARB): Make requested change.

DYNO SPEED-TIME PROFILES

- Industry: Exhaust profile should match evaporative profile. We did a large test in Texas, and the average speed for entire fleet was around 6 miles per hour. Very fuel people are capable of handling a vehicle in those terrains in high speeds. Running through dyno vs sand are very different but I do not think ARB cares about emissions in the sand. ARB is concerned with diurnal emissions being stored in the garage.
  - ARB- Evaporative emissions are a result of load. Our worry is that an ATV that is rated at 40 mph and is tested at 5 is not an adequate test reflective of use. An alternative may also be a European on-highway standard as an option to certify. We have to look at this more and attempt to model it.
  - Action Item (MIC): Provide test results from Texas study.
  - Action Item (ARB): Discuss internally.
- Industry: Are ATV safe to operate at various conditions? We are going from artificial test to another more artificial test.
  - ARB- There is the option to do the alternative load cycle test. It does have higher horsepower associated with it. ATVs being tested at below 10% of their load are not clearly test the real use of this equipment. The higher rated vehicles are sometimes used to pull equipment or for multiple passenger riding. Is there data to suggest they are used mostly at low speeds at the lightest loads?
  - Action item (ARB): Discuss internally.

PERFORMANCE STANDARDS- TABLE 2

- Industry: There is uncertainty regarding the references to permeation standards in other tables (1 and 3), in the requirements for Table 2.
  - Action item (ARB): Clarify permeation standards to meet performance standards.

END QUESTIONS

- Industry: Why is there multiple standards in table 2? Would it make sense to correlate with SORE?

- ARB- No it does not, this is just an equivalent standard but I cannot see a way to correlate.
- Action item (ARB): Review SORE standards table and attempt to correlate.

- Industry: We have similar concerns as MIC for the 5 year warranty
  - ARB- I know most of them do not have odometers but adding an hour meter could be an alternative.
- Industry: If emission components are not visible do they do not need to use tamper proof clamps and fasteners?
  - ARB- We are now considering this.
  - Action item (ARB): Discuss internally.
- Industry: Tip test only applies to ATV and Motorcycles?
  - ARB- We would like to apply it to all, so we will change to "OHRV".
  - Action item (ARB): Make requested changes.

Additional Comments Received

Email received from Dan Grimes (Centro Inc) on December 20, 2012:

Mr. Mader,

Regarding the proposed Recreational Vehicle permeation regulations, I have some concerns with the regulations, liability and test procedures.

The Small Non-Road/Off-Road and Marine markets are extremely diverse and have a very broad supply base for components including fuel system components. Centro Inc. is the largest custom rotational molder in the USA. We work with numerous OEMs to meet their custom fuel tank needs. Centro has lead the way for rotational molders in addressing the evaporative emission regulations, being the first molder to obtain both CARB and EPA approval for our patent pending RotoLoPerm® multilayer technology. We began researching and developing low permeation fuel tank technologies over a decade ago and continue to put an emphasis on being the best at what we do.

The Small Off-Road Equipment ARB regulations as well as the EPA regulations seemed to take into account the very diverse markets and lower annual volumes that are typical. Unlike the automotive market, the equipment and fuel system designs take on many forms and vary greatly in the specific sizes, shapes and functions (i.e. fuel tanks that double as storage compartments and/or styling panels). Additionally, these unique designs that characterize the market and are a very big part of the success of the product, are not only unique but also many times produced in smaller quantities. Therefore, regulations which allow the flexibility of design based conformance are very important. Being able to test and prove a single tank or technology and then apply that to numerous designs has been crucial to the success of many molders meeting the existing regulations. Though ARB seems to have a handle on the economic impact from a part price perspective, the qualification/testing aspect is another key aspect that seems to be misunderstood with this latest proposed regulation.

The proposed regulations for Recreational Vehicles have added performance standards including the measurement of running loss emissions, emissions during hot soak, diurnal emissions as well as the tip test that seem to make design based conformance out of reach. Some of these tests, particularly the Tip Test, seem to be somewhat non value add. For example, I believe that it would be impossible to pass any type of permeation test if your fuel system allows liquid leakage when the tank is tipped in the ranges defined. But having this as part of the regulation demands a certain level of testing and paperwork that would drive unneeded cost into these systems.

I propose defining a purely design based option to avoid these types of testing if desired by the OEM or fuel system component suppliers. By using components which have all been independently tested and combining them, the system could achieve a drastic reduction in evaporative permeation compared to existing products while also being more manageable from the OEM, Fuel System supplier AND ARB perspective.

In addition, I have further concerns and a request for more details on where exactly liability lies with these proposed regulations. For example, as a custom part supplier, Centro retains no design control of the actual fuel tank and especially the overall fuel system. Does the OEM have overall responsibility and liability with regards to these regulations? If the intent is to have the fuel tank manufacturer carry the responsibility for meeting the performance standards as well as the warranty responsibilities, molders like Centro would have to incur great costs to test each and every tank design for each and every customer which would make the business very unattractive and drive costs into the end part which could be damaging to the entire industry. In many cases, this would not only dramatically extend new product development periods causing delays to market, but also could potentially be impossible because of secrecy issues with new product development programs.

Finally, with regards to the filler neck design requirement, it seems that there a discrepancy as it does not call out a minimum inner diameter. The current wording in 2418 (b)(1)(C) defines a range of outer diameters and a maximum inner diameter. More definition is requested for this requirement. I assume a minimum inner diameter is crucial to fit standard filling equipment nozzles. Based on this clarification, I might have more concerns with this requirement as it could be impossible with certain manufacturing methods.

Again – it seems that there is precedence for design based conformance that is very effective at accomplishing the end goal of reducing hydrocarbon emissions while also remaining minimally disruptive to the market. The proposed regulations seem to be approaching the same problem from a different perspective which could have very negative effects on the market.

I would appreciate you feedback and clarification on these points.

ARB Response:

Dan,

Thanks for your input, we always appreciate stakeholder input. A design based standard has multiple political and technical challenges that would have to be overcome. Politically, as regulators we try to not force any specific technology, rather we try to allow manufacturers the flexibility to minimize their costs while getting the required reductions. Technically, we have seen data suggesting the emission are hugely affected by the attention to detail of assembly. Without a test of the whole fuel system it is very hard to verify that all the components were assembled correctly.

The tip test is designed to eliminate a current problem, it is also designed to verify carbon canister protection.

As I see it, liability for a vehicle certified to a performance standard would be held by the certifier (manufacturer). However, for the small volume exemption where certified components can be used the component certifier would be responsible to make sure their components met the standards that they certified to.

Let me know if you have any additional questions,
Pippin

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER THE APPROVAL OF THE PROPOSED ASSEMBLY BILL 118 AIR QUALITY IMPROVEMENT PROGRAM FUNDING PLAN FOR FISCAL YEAR 2013-14

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider approval of the *Proposed Assembly Bill 118 Air Quality Improvement Program Funding Plan for Fiscal Year 2013-14* (Funding Plan).

DATE: July 25, 2013

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., July 25, 2013. Please consult the agenda for the meeting, which will be available at least ten days before July 25, 2013, to determine the order of agenda items.

Background:

The Air Quality Improvement Program (AQIP), administered by ARB, is a voluntary incentive program created under the California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007 (Assembly Bill (AB) 118; Núñez, Chapter 720, Statutes of 2007). Through AQIP, ARB invests in clean vehicle and equipment projects that reduce criteria pollutant and air toxic emissions, often with concurrent climate change benefits. Funding for AQIP is provided through a dedicated revenue stream of fees that expire at the end of 2015, including smog abatement fees, vessel registration fees, and equipment identification plate fees.

AQIP provides funding for projects not covered by other ARB incentive programs. AQIP is ARB's only incentive program structured to enable investments in technology advancing projects that also provide immediate emission reductions. AQIP investments to date support the initial deployment of hybrid and zero-emission trucks, zero-emission and plug-in hybrid passenger cars, and other advanced technology demonstrations critical to meeting California's long-term air quality and climate change goals. AQIP investments are an important first step in the fundamental transformation of the California vehicle fleet to one with widespread use of near-zero and zero-emission vehicles.

The Governor's proposed fiscal year 2013-14 State Budget authorizes, dependent upon revenues, up to $35 million in funding for AQIP projects. ARB's regulatory guidelines governing implementation of AQIP require that the Board approve an annual funding plan describing how AQIP funds will be spent each fiscal year.

Overview of Fiscal Year 2013-14 Funding Plan:

For the fiscal year 2013-14 funding cycle, ARB staff proposes to focus most of AQIP funding on the two largest project categories from previous years – the Clean Vehicle Rebate Project and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project. There has been strong demand for funding in these areas, and both electric vehicle and hybrid truck technologies are at a key point where public incentives can help them penetrate the California marketplace and become mainstream choices. Staff also proposes to continue an allocation for advanced technology demonstrations and testing, which are an important part of the program because successful demonstration projects can potentially lead to deployment project opportunities in the future. Additionally, staff proposes to provide an allocation of funding to the Truck Loan Assistance Program, which aids smaller fleets in obtaining private financing for clean truck upgrades ahead of regulatory compliance schedules.

In recent years, Board approved plans contained two separate funding targets: one that reflected funding allocations based on the total proposed budget authority, and one that reflected a more "realistic" estimate of expected available funding based on anticipated revenue and administrative costs. Several times in recent years revenues have come in below even the "realistic" estimate. This year, to manage the uncertainty regarding available revenues that will ultimately be available for AQIP projects, ARB staff is proposing a more flexible approach that establishes minimum funding targets that balance the needs of all four projects, while holding in reserve a portion of anticipated revenue that can be directed to these projects throughout the year as they demonstrate a need for additional funding. Staff believes that this approach would allow ARB to be more responsive to changes in market demand, while committing to minimum funding levels for stakeholder planning purposes. Solicitations would be issued for the minimum funding levels shown in Table 1 with provisions to scale up funding as project demand grows.

Table 1: Proposed Fiscal Year 2013-14 Project Category Funding Levels

Project Category		Proposed Minimum Allocations
Deployment Projects	Clean Vehicle Rebate Project	$10 M
	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project	$5 M
	Truck Loan Assistance Program	$2 M
Advanced Technology Demonstration/Testing		$3 M
Additional Expected Revenue/Reserve		$5 M
	Total	**$25 M**

ARB staff proposes establishing a minimum funding allocation of $10 million for the Clean Vehicle Rebate Project. In addition, the California Energy Commission (CEC) has approved $5 million from the Alternative and Renewable Fuel and Vehicle Technology Program for fiscal year 2013-14, bringing the minimum allocation for the Clean Vehicle Rebate Project to $15 million.

Despite this significant investment of AQIP funding, rebate demand is expected to outstrip available funding in the project as early as the fall of 2013. As part of the public process for developing this year's Funding Plan, staff engaged stakeholders and the public on options for modifications to the Clean Vehicle Rebate Project that could potentially extend funding beyond this date. While there was general agreement that changes to the project were needed to help ensure its long-term sustainability, stakeholders were concerned that near-term changes (such as lower rebate amounts) could have unintended market consequences, and that any changes should be analyzed before being implemented. Based on this feedback, while recognizing the need to have a 2013-2014 AQIP funding plan in place at the beginning of the fiscal year, at this time staff is only proposing a few minor administrative changes to the Clean Vehicle Rebate Project that include standardizing zero-emission vehicle rebates, maintaining a set-aside for public fleets, and adjusting maximum rebates per consumer type. Because available funding is expected to be exhausted no later than midway into fiscal year 2013-14, staff is not proposing a waiting list provision. However, pending any funding changes in the State Budget after the release date of the proposed Funding Plan, ARB staff may propose further modifications at the Board meeting.

While significant program changes are not being initially proposed as part of this year's funding plan, staff is intending to immediately undertake focused discussions with stakeholders to develop a sustainable long-term vision for the program. This effort will include the discussion of options to better align the Clean Vehicle Rebate Project with the near-term deployment needs of current technologies that are in the process of transitioning into mainstream consumer choices (such as battery electric vehicles), the identification of metrics for when these technologies no longer need public incentives in the marketplace, and on the long-term needs for newer technologies where public investment may be needed for years to come (such as hydrogen fuel cell vehicles).

Staff is proposing to return to the Board by the end of 2013 to provide a status update on the progress made with stakeholders to develop a sustainable vision for the Clean Vehicle Rebate Project, and to present recommendations for program changes.

Correspondingly, staff is proposing a $5 million minimum allocation for the Hybrid and Zero Emission Truck and Bus Voucher Incentive Project, which could potentially fund approximately 150 vehicles. Staff is also proposing a $2 million minimum allocation for the Truck Loan Assistance Program and a $3 million minimum allocation for advanced technology demonstrations, of which $1 million is intended to fund the Zero Emission Transit Demonstration Project that was not funded in fiscal year 2012-13 due to insufficient revenues.

The Proposed Funding Plan will also outline: (1) ARB priorities for the funding cycle; (2) funding allocations by project category; (3) project category descriptions, including refinements based on public input and evaluation of previous years' project implementation; and (4) contingency provisions to address uncertainties in available funding levels.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

ARB staff will present the *Proposed AB 118 Air Quality Improvement Program Funding Plan for Fiscal Year 2013-14* at the meeting. Copies of the report may be obtained from ARB's Public Information Office, 1001 I Street, First Floor, Environmental Services Center, Sacramento, California, 95814, (916) 322-2990 at least 30 days prior to the scheduled meeting on July 25, 2013. The report may also be obtained from ARB's website at http://www.arb.ca.gov/msprog/aqip/aqip.htm.

SUBMITTAL OF COMMENTS

Interested members of the public may present comments orally or in writing at the meeting and may be submitted by postal mail or by electronic submittal before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, July 24, 2013,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the meeting so that ARB staff and Board members have additional time to consider each comment. Further inquiries regarding this matter should be directed to Ms. Lisa Macumber, Air Pollution Specialist, at (916) 323-2881, or Ms. Graciela Garcia, Air Pollution Specialist, at (916) 323-2781.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format (i.e., Braille, large print, etc.) or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno (por decir, sistema Braille, o en impresión grande) u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: June 25, 2013

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.

California Environmental Protection Agency

Air Resources Board

ASSEMBLY BILL 118 AIR QUALITY IMPROVEMENT PROGRAM FUNDING PLAN FOR FISCAL YEAR 2013-14

Release Date: **June 25, 2013**
Board Consideration: **July 25, 2013**

TABLE OF CONTENTS

Executive Summary i

I. About AQIP 1

A. Statutory and Regulatory Guidelines 1
B. Purpose and Goals of AQIP 2
C. Program Benefits 3
D. Revenue Sources 4

II. Guiding Principles for Identifying AQIP Projects 5

A. Implementation Priorities 5
B. Deployment Projects 5
C. Advanced Technology Demonstration Projects 6
D. Other Project Categories 7

III. Proposed Funding Plan for Fiscal Year 2013-14 8

A. Summary of Funding Proposal 8
B. Description of Project Categories Proposed for Fiscal Year 2013-14 Funding 11
Clean Vehicle Rebate Project 12
Hybrid and Zero Emission Truck and Bus Voucher Incentive Project 21
Advanced Technology Demonstration Projects 29
Truck Loan Assistance Program 34
C. Other AQIP Project Categories 37
D. Contingency Plans 39
E. Fiscal Year 2013-14 Project Solicitations 39

IV. References 42

Executive Summary

The Air Quality Improvement Program (AQIP), administered by the Air Resources Board (ARB or Board), is a voluntary incentive program created under the *California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007* (Assembly Bill (AB) 118; Núñez, Chapter 750, Statutes of 2007). Through AQIP, ARB invests in clean vehicle and equipment projects that reduce criteria pollutant and air toxic emissions, often with concurrent climate change benefits. Funding for AQIP is provided through a dedicated revenue stream of fees that expire at the end of 2015, including smog abatement fees, vessel registration fees, and equipment identification plate.

AQIP provides funding for projects not covered by other ARB incentive programs. AQIP is ARB's only incentive program structured to enable investments in technology advancing projects that also provide immediate emission reductions. AQIP investments have supported the initial deployment of hybrid and zero-emission trucks, zero-emission and plug-in hybrid passenger cars, and other advanced technology demonstrations/testing critical to meeting California's long-term air quality and climate change goals. AQIP investments are an important first step in the fundamental transformation of the California vehicle fleet to one with widespread use of near-zero and zero-emission vehicles.

The Governor's proposed fiscal year 2013-14 State Budget authorizes, dependent upon revenues, up to $35 million in funding for AQIP projects. ARB's regulatory guidelines governing implementation of AQIP require that the Board approve an annual Funding Plan describing how AQIP funds will be spent each fiscal year. The *Proposed Assembly Bill 118 Air Quality Improvement Program Funding Plan for Fiscal Year 2013-14* (Funding Plan) outlines: (1) ARB priorities for the funding cycle; (2) funding allocations by project category; (3) project category descriptions, including refinements based on public input and evaluation of previous years' project implementation; and (4) contingency provisions to address uncertainties in available funding levels.

<u>Summary of the Fiscal Year 2013-14 Funding Proposal</u>

Because advanced light-duty and heavy-duty vehicle technologies are at a key point where public incentives can help them penetrate the California marketplace and become mainstream choices, for the fiscal year 2013-14 funding cycle, ARB staff proposes to focus most of AQIP funding on the two largest project categories from previous years – the Clean Vehicle Rebate Project and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project. Staff also proposes to continue an allocation for advanced technology demonstrations, which are an important part of the program because successful demonstration projects can lead to future deployment project opportunities. Additionally, staff proposes to provide an allocation of funding to the Truck Loan Assistance Program, which aids smaller fleets in obtaining private financing for clean truck upgrades ahead of regulatory compliance schedules.

In recent years, Board approved plans contained two separate funding targets: an upper bound that reflected "best case" funding allocations based on AQIP's total proposed budget authority, and one that reflected a more "realistic" estimate of available funding based on expected revenue and administrative costs. In some recent years, actual revenue has come in below even the "realistic" estimate. This year, to manage the uncertainty regarding available revenues that will ultimately be available for AQIP projects, ARB staff is proposing a more flexible approach that establishes minimum funding targets that balance the needs of all four projects, while holding in reserve a portion of anticipated revenue that can be directed to these projects throughout the year as they demonstrate a need for additional funding. Staff believes that this approach would allow ARB to be more responsive to changes in market demand, while committing to minimum funding levels for stakeholder planning purposes. Solicitations would be issued for the minimum funding levels shown in Table ES-1 with provisions to scale up funding as project demand grows.

Table ES-1: Proposed Fiscal Year 2013-14 Project Category Funding Levels

Project Category		Proposed Minimum Allocation (Millions)
Deployment Projects	Clean Vehicle Rebate Project	$10
	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project	$5
	Truck Loan Assistance Program	$2
Advanced Technology Demonstration/Testing		$3
Additional Estimated Revenue/Reserve		$5
	Total	$25

ARB staff proposes establishing a minimum funding allocation of $10 million for the Clean Vehicle Rebate Project. In addition, the California Energy Commission (CEC) has approved $5 million from the Alternative and Renewable Fuel and Vehicle Technology Program for fiscal year 2013-14, bringing the minimum allocation for the Clean Vehicle Rebate Project to $15 million.

Despite this significant investment of AQIP funding, rebate demand is expected to outstrip available funding in the project as early as the fall of 2013. As part of the public process for developing this year's Funding Plan, staff engaged stakeholders and the public on potential options for modifications to the Clean Vehicle Rebate Project that could potentially extend funding beyond this date. While there was general agreement that changes were needed to the project to ensure its long-term sustainability, stakeholders were concerned that near term changes (such as lower rebate amounts) could have unintended market consequences, and that any changes should be analyzed before being implemented. Unintended market consequences may be disruptive given that the zero-emission vehicle market is at a critical point as it matures and transitions beyond early adopters. Although vehicle manufacturers are responding to market needs by offering lower price points, rebates can be a deciding factor in many consumers' economic ability to purchase or lease these cleaner vehicles. Based on these considerations and stakeholder feedback, at this time staff is not proposing any significant changes to the Clean Vehicle Rebate Project as part of this year's initial Funding Plan.

While significant program changes are not being initially proposed as part of this year's funding plan, staff is intending to immediately undertake a focused process with stakeholders to develop a sustainable long-term vision for the program. This effort will include the discussion of options to better align the Clean Vehicle Rebate Project with the near-term deployment needs of current technologies that are in the process of transitioning into mainstream consumer choices (such as battery electric vehicles), the identification of metrics for when these technologies no longer need public incentives in the primary and secondary marketplace, and on the long-term needs for newer technologies where public investment may be needed for years to come (such as hydrogen fuel cell vehicles). Public incentives remain critical for ensuring the long-term affordability and effective fleet turn-over by reducing production costs of advanced technology vehicles through spurring higher, more efficient production volumes; and accelerating consumer acceptance of new unfamiliar vehicle technologies. Staff is proposing to return to the Board by the end of 2013 to provide a status update on the progress made with stakeholders to develop a sustainable and more effective vision for the Clean Vehicle Rebate Project, and to present any appropriate recommendations for program changes.

Staff is proposing a $5 million minimum allocation for the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, which is expected to fund approximately 150 vehicles. With the relatively low availability of funds dedicated to the fiscal year 2013-14 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, staff recommends limiting each fleet to no more than 100 vouchers in fiscal year 2013-14, down from the current limit of 200 vouchers per fiscal year, to ensure no single fleet receives all of the project funds. Staff does not believe this will have an impact on fleets because no single fleet has ever requested more than 100 vouchers in a year. Staff is also proposing various technical changes to the project, including strengthening the three-year warranty requirements and offering higher voucher amounts for fast charge compatible vehicles. These changes aim to further the deployment of more advanced and robust hybrid and zero-emission technologies and ensure available funding to a diversity of fleets.

Advanced technology demonstrations remain a critical element of AQIP because they accelerate commercialization and deployment of cleaner technologies in broader applications and across multiple sectors. In support of this, a $3 million minimum allocation is proposed for advanced technology demonstrations, of which $1 million is intended to fund a Zero Emission Transit Demonstration Project that was not funded previously due to insufficient revenues in fiscal year 2012-13.

Additionally, AQIP provides one of a limited number of funding sources available to offer financing solutions to a wide range of small business truckers through the Truck Loan Assistance Program. The Truck Loan Assistance Program is the only incentive funding source available to truck owners for assistance with purchasing cleaner vehicles ahead of regulatory compliance schedules for existing in-use fleet rules. For fiscal year 2013-14, ARB staff proposes a $2 million minimum allocation for truck loans, which could result in approximately 300 loans for clean vehicles and/or equipment.

ARB staff held two public workshops and five detailed public work group meetings in developing the proposed Funding Plan. ARB staff also maintains an open dialog with the CEC and other stakeholders in the development of the Funding Plan. As in previous years, ARB staff will hold additional public work group meetings through the year to update stakeholders on project implementation.

Recommendation

Staff recommends the Board approve the proposed fiscal year 2013-14 Funding Plan.

I. About AQIP

This chapter describes the guidelines, goals, and revenue sources for AQIP.

A. Statutory and Regulatory Guidelines

Enabling Statute: AQIP is a voluntary incentive program created under the *California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007* (AB 118; Núñez, Chapter 750, Statutes of 2007) to fund clean vehicle and equipment projects and air quality research and training. AQIP focuses on reducing criteria pollutant and diesel particulate pollution with concurrent reductions in greenhouse gas emissions.

AQIP is 1 of 3 incentives programs created under AB 118. The other 2 programs include the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the CEC, and the Enhanced Fleet Modernization Program, administered by the Bureau of Automotive Repair (BAR). The Alternative and Renewable Fuel and Vehicle Technology Program allocates roughly $100 million a year toward alternative and renewable fuels; advanced technology cars, trucks, and equipment; vehicle manufacturing; workforce training; and fueling infrastructure. Additionally, BAR's Enhanced Fleet Modernization Program provides approximately $30 million annually to accelerate the turnover of the existing light-duty fleet.

Health and Safety Code (HSC) section 44274 allows for a variety of eligible AQIP project categories that can be divided into 3 general project types:

- <u>*Commercial Deployment*</u>: These projects include the next generation of advanced technology vehicles and equipment just reaching commercialization. Consumer incentives are needed because these products generally cost more than their traditionally powered (e.g., gas or diesel) counterparts, which can be a significant barrier to their purchase. Incentives will accelerate consumer acceptance and have the immediate benefit of reducing criteria pollutants, air toxics, and greenhouse gas emissions. Incentives help drive down vehicle costs through economies of scale as production volumes increase, and accelerating technology transfer to other sectors. Most AQIP funding awarded to date has been directed to commercial deployment projects.

- <u>*Advanced Technology Demonstration*</u>: ARB's goal in funding demonstration projects is to help demonstrate the viability of new, cleaner technologies. AQIP funds are used to accelerate the introduction of advanced technology vehicles, equipment or emission controls that are not yet commercialized. The demonstration projects funded now could become deployment projects several years from now if the technology proves successful. ARB has included an allocation for advanced technology demonstration projects in each AQIP Funding Plan.

- *Research and Workforce Training*: Statute allows AQIP to fund research on the air quality impacts of alternative fuels, research to increase biofuel production, and workforce training related to advanced technologies. These project types provide the information and training necessary to develop the advanced fuels and vehicles most effective in reducing air pollution. To date, ARB has not directed AQIP funding to research and workforce training categories because there are already large investments being made by other agencies. For example, CEC has directed a total of $24.6 million to advanced technology workforce training projects through the Alternative and Renewable Fuel and Vehicle Technology Program since the 2008-09 fiscal year, and has allocated an additional $2 million investment in the upcoming funding cycle. CEC has also allocated a total of $13.8 million for Emerging Opportunities that may include research on advanced fuels and innovative technologies. Accordingly, ARB staff again proposes deferring AQIP funding for these project categories.

Regulatory Guidelines: Prior to awarding funding for AQIP projects, ARB adopted regulations that establish the administrative procedures for implementing AQIP in order to ensure that the program is run efficiently, with transparency and public input.

As required in HSC section 44274(a), the Board adopted regulatory guidelines in 2009 which define the overall administrative requirements and policies and procedures for program implementation based on the framework established in statute. Central to the guidelines is the requirement for a Board-approved annual funding plan developed with public input. The funding plan is each year's blueprint for expending AQIP funds appropriated to ARB in the annual State Budget: describing the projects ARB intends to fund, establishing funding targets for each project, and providing the justification for these decisions. AQIP guidelines also establish the rules and requirements for soliciting projects and awarding funds.

The Board also adopted AB 118 Air Quality Guidelines as required in HSC section 44271(b). This regulation, also known as the "anti-backsliding guidelines," ensures that ARB and CEC AB 118 programs complement California's existing air quality programs by maintaining or improving upon emission benefits in the State Implementation Plan (SIP) and California's clean fuels regulations.

B. Purpose and Goals of AQIP

In order to meet California's post-2020 federally-mandated SIP emission reduction targets and climate change goals, ARB must pursue an aggressive suite of control measures, and utilize incentives and other approaches as often as possible. Specific regulations adopted or under development to help achieve clean air requirements include ARB's Truck and Bus regulation, which requires engine upgrades as early as 2015, and the In-Use Off-Road Mobile Equipment Regulation.

Additionally, the Federal Clean Air Act includes a provision that allows SIPs for areas with the worst air quality (the extreme ozone nonattainment areas – the South Coast Air

Basin and the San Joaquin Valley) to rely on advanced, yet to be developed, technologies. Both the South Coast and the San Joaquin Valley air basins have ozone attainment dates in 2023 and new National Ambient Air Quality Standards established additional milestones to be met in 2032. Attainment of these standards will likely require significant use of zero- and near zero emission technologies, which are the same technologies needed to meet greenhouse gas emission reduction goals.

A fundamental transformation of the vehicle fleet will need to occur in order to meet the goal of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050 (Executive Order S-3-05). Critical to this is that zero-emission and hybrid vehicles will need to make up an increasingly significant fraction of California's vehicle fleet. In January 2012, ARB adopted the Advanced Clean Cars regulations which will require 1 out of every 7 new cars purchased in 2025 to be zero-emission or plug-in hybrid. This was followed by Executive Order B-16-2012 that sets a 2050 target for greenhouse gas emission reductions from the transportation sector equaling 80 percent less than 1990 levels, and directs state agencies to establish benchmarks for expanding the zero emission vehicle market share with over 1.5 million zero-emission vehicles on California roads, easy access to zero-emission vehicle infrastructure, and petroleum displacement of at least 1.5 billion gallons by 2025.

AQIP investments are an important early step in supporting this transformation. AQIP expands ARB's portfolio of air quality incentives, providing the opportunity to fund projects not covered by ARB's other incentive programs – the Carl Moyer Program[1], Goods Movement Emission Reduction Program[2], and Lower-Emission School Bus Program[3]. These other programs augment regulatory programs by paying for the incremental cost of cleaner vehicles, engines, and equipment; reducing diesel emissions ahead of compliance schedules or by more than is required; and focusing on near-term emission reductions from fully commercialized emission control technologies. Statute provides broader flexibility for implementing AQIP, and with it, the ability to focus on longer-term air quality goals. AQIP is the only ARB program structured to allow for investments in technology advancing projects.

AQIP funds are supporting the demonstration and deployment of hybrid-electric vehicles, zero-emission vehicles, and other advanced technologies which provide immediate emission reductions and are also critical to meeting air quality and climate change goals. With the time it takes for significant fleet turnover, California needs to start placing these zero- and near-zero emission vehicles on our roadways today to achieve large-scale emission reductions in future decades.

C. Program Benefits

AQIP provides a modest down payment on the technologies needed to meet long-term air quality and climate change goals, with a focus on stimulating the widespread use of

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[1] See www.arb.ca.gov/msprog/moyer/moyer.htm
[2] See www.arb.ca.gov/bonds/gmbond/gmbond.htm
[3] See www.arb.ca.gov/msprog/schoolbus/schoolbus.htm

these technologies. AQIP projects provide both immediate emission reductions from the vehicles directly funded and, more importantly, set the stage for greater, indirect reductions in the future by accelerating large-scale market penetration. These longer-term program benefits accrue primarily from overcoming deployment barriers, reducing production costs, promoting consumer acceptance, and accelerating technology transfer to other sectors. Additionally, AQIP investments in advanced technology vehicles have been supported by CEC investments in infrastructure to ensure that necessary fueling networks are developed, thus reinforcing California's ongoing commitment to clean technologies.

D. Revenue Sources

Funding for AQIP comes primarily from the Smog Abatement Fee which is assessed annually for a vehicle's first 6 registration years in lieu of providing a biennial smog certification. Of the $20 collected for each vehicle at the time of annual registration, $4 is allocated to ARB for AQIP, with the remaining directed towards the Carl Moyer Program, CEC's AB 118 program, and BAR's smog check vehicle repair assistance program. In addition, a small portion of AQIP funding comes from 2 additional sources: a $10 or $20 initial registration fee for new vessels, dependent upon the year in which the new registration is filed, and $2.50 for annual special equipment identification plate fees.

Each year funding is allocated to ARB in the State Budget for AQIP. The Governor's Proposed fiscal year 2013-14 State Budget allocates up to about $35 million for AQIP. However, over the past several years, actual revenues in the Air Quality Improvement Fund have been lower than the State budget allocation by about 25-30 percent.

Additionally, the fees identified above generate approximately $2 million each month to be expended on AQIP projects. However, demand for fiscal year 2013-14 Clean Vehicle Rebate Project rebates and Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project vouchers alone are expected to exceed $5 million per month. AQIP revenues available in the early part of fiscal year 2013-14 may not be sufficient to fund AQIP projects in real time. Because of this, consumers may experience delays in receiving AQIP funding. Staff continues to explore options to minimize potential delays in rebate and voucher redemptions due to AQIP revenue shortfalls early in the fiscal year.

II. Guiding Principles for Identifying AQIP Projects

This chapter describes the implementation priorities and guiding principles that ARB staff used to identify the projects proposed for funding in fiscal year 2013-14.

A. Implementation Priorities

As discussed in Chapter I, AB 118 allows for a range of eligible AQIP project categories, including commercial deployment, demonstration, research, and workforce training projects. Consistent with previous fiscal years, staff proposes to continue to focus program funds on accelerating commercialization of advanced technologies needed to meet California's longer-term, post 2020 SIP goals. This area is not particularly well served in the Carl Moyer Program or Goods Movement Emission Reduction Program, which focus on achieving near-term emission reductions from already commercialized technologies.

B. Deployment Projects

Staff is proposing to use the following guiding principles for selecting eligible vehicle and equipment deployment projects for fiscal year 2013-14:

- Attain Ambient Air Quality Standards: Projects should help California meet federal ambient air quality standards and spur deployment of advanced technologies to meet the SIP advanced technology commitments. Early deployment is critical to ensure significant technology penetration by the 2023 extreme ozone nonattainment area attainment date. Projects should also help achieve the state air quality standards, reduce toxic air contaminant emissions, and complement California's efforts to meet its climate change goals.

- Ready for Deployment: Projects should be ready for immediate on-the-ground deployment. Technologies that could help meet SIP advanced technology commitments but which are not ready for deployment would be considered for funding as demonstration projects.

- Modify Consumer Choice: Incentives should be focused on inducing vehicle and equipment purchases that would not otherwise have occurred, or advance market penetration to enable long-term benefits.

- Consider Funding Need: Project types that do not have access to other ARB incentive program funds, such as Carl Moyer Program and Goods Movement Emission Reduction Program funds, would be prioritized. Projects should also be coordinated with AB 118 projects funded by the CEC.

Staff proposes to continue to fund the two advanced technology deployment projects that it has funded in recent years: the Clean Vehicle Rebate Project and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project. These projects were intended to be funded for multiple years in order to help promote large scale penetration of advanced light-, medium-, and heavy-duty on-road technologies.

Additionally, staff is proposing to provide funding for the Truck Loan Assistance Program, which assists small business truck owners in obtaining affordable financing for necessary truck upgrades ahead of regulatory compliance schedules. The Truck Loan Assistance Program acts as a deployment project in that it supports technologies necessary for meeting federal air quality standards; helps modify consumer choice by offering options to upgrade trucks with technology that might not otherwise have been purchased; and fills a funding need by providing financing opportunities to small business truck owners that are experiencing challenges obtaining financing in California's volatile economic climate and tight credit market.

C. Advanced Technology Demonstration Projects

ARB's goal in funding demonstration projects under AQIP is to help accelerate the next generation of advanced technology vehicles, equipment, or emission controls which have not yet reached the commercialization stage of development. AQIP funding is used to demonstrate the viability of a new technology. Consistent with previous years, staff proposes to continue to focus funding for demonstration projects on technologies with the potential to provide cost-effective emission reductions that can be quickly introduced to the California marketplace. While the focus is accelerating technologies that provide criteria pollutant and toxic emission reductions, staff will also identify projects with ancillary greenhouse gas emission reductions where possible. Staff proposes to use the following guiding principles for selecting demonstration projects for fiscal year 2013-14:

- The project must be able to demonstrate the potential to provide cost-effective emission reductions. Projects are scored using Carl Moyer Program cost-effectiveness methodologies for estimated emissions during both the actual demonstration project and when the technology is deployed into the marketplace.

- The project must be near commercialization with potential to be economically viable without incentives.

- The project must be completed expeditiously, with potential deployment into the market place within 3 years following the completion of the demonstration. Potential deployment is evaluated based on several factors, including, but not limited to, the defined target markets; the identified market barriers and ability to overcome them; the identified market niche, its size, and potential growth; the financial strength of the technology demonstrator; and the project team's capability to bring the project to market.

- The project must have the potential for use in the California marketplace.

For fiscal year 2013-14, staff proposes to focus demonstration project funding primarily in off-road categories due to the need for long term emission reductions from off-road sources. Projects are proposed in the locomotive, marine, agricultural, and other off-road sectors. By funding off-road demonstration projects now, ARB staff envisions that there will be a greater opportunity to fund advanced technology off-road deployment projects in the future years.

In addition, staff proposed to fund a Zero Emission Transit Demonstration Project that was not funded due to insufficient revenues in fiscal year 2012-13. The goal of this project is to advance the pace of fuel-cell development, battery bus technology, and/or expand zero emission vehicles into the paratransit and shuttle bus market.

ARB staff is coordinating demonstration project funding with CEC's AB 118 program. Focusing fiscal year 2013-14 AQIP funds on off-road demonstration projects allows CEC to continue their focus on funding on-road demonstration projects. Staff will continue to work closely with CEC to coordinate AB118 efforts.

D. Other Project Categories

Not all eligible project categories identified in statute are proposed for funding in fiscal year 2013-14. As noted in Chapter I, staff is not proposing funding in the following areas as they already receive substantial investment from other entities:

- Research on the air quality impacts of alternative fuels and on biofuels production.
- Workforce training.
- Projects to identify and reduce emissions from high-emitting light-duty vehicles.

III. Proposed Funding Plan for Fiscal Year 2013-14

For the fiscal year 2013-14 funding cycle, ARB staff proposes to focus most of AQIP funding on the two largest project categories from previous years – the Clean Vehicle Rebate Project and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project. There has been strong demand for funding in these areas, and advanced light-duty and heavy-duty vehicle technologies are at a key point where public incentives can help them penetrate the California marketplace and become mainstream choices. Staff also proposes to continue an allocation for advanced technology demonstrations, which are an important part of the program because successful demonstration projects can potentially lead to future deployment project opportunities. Additionally, staff proposes to provide an allocation of funding to the Truck Loan Assistance Program, which aids smaller fleets in obtaining private financing for clean truck upgrades ahead of regulatory compliance schedules.

ARB staff held two public workshops and five detailed public work group meetings in developing the proposed Funding Plan. ARB staff also maintains an open dialog with stakeholders in the development of the Funding Plan and closely coordinates with CEC to ensure that the Funding Plan and the Alternative and Renewable Fuel and Vehicle Technology Program Investment Plan compliment one another. As in previous years, ARB staff will hold additional public work group meetings through the year to update stakeholders on project implementation.

A. Summary of Funding Proposal

In recent years, Board approved plans contained 2 separate funding targets: an upper bound that reflected "best case" funding allocations based on AQIP's total proposed budget authority, and one that reflected a more "realistic" estimate available funding based on expected revenue and administrative costs. In some recent years, actual revenue has come in below even the "realistic" estimate. This year, to manage the uncertainty regarding available revenues that will ultimately be available for AQIP projects, ARB staff is proposing a more flexible approach that establishes minimum funding targets that balance the needs of all 4 projects, while holding in reserve a portion of anticipated revenue that can be directed to these projects throughout the year as they demonstrate a need for additional funding. Staff believes this approach allows ARB to be more responsive to changes in market demand, while committing to minimum funding levels for stakeholder planning purposes. Solicitations would be issued for the minimum funding levels shown in Table III-1 with provisions to scale up funding as project demand grows.

Table III-1: Proposed Fiscal Year 2013-14 Project Category Funding Levels

Project Category		Proposed Minimum Allocation (Millions)
Deployment Projects	Clean Vehicle Rebate Project	$10
	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project	$5
	Truck Loan Assistance Program	$2
Advanced Technology Demonstration/Testing		$3
Additional Estimated Revenue/Reserve		$5
	Total	$25

ARB staff proposes establishing a minimum funding allocation of $10 million for the Clean Vehicle Rebate Project. In addition, the CEC has approved $5 million from the Alternative and Renewable Fuel and Vehicle Technology Program for fiscal year 2013-14, bringing the minimum allocation for the Clean Vehicle Rebate Project to $15 million.

Despite this significant investment of AQIP funding, rebate demand is expected to outstrip available funding in the project as early as the fall of 2013. As part of the public process for developing this year's Funding Plan, staff engaged stakeholders and the public on potential options for modifications to the Clean Vehicle Rebate Project that could potentially extend funding beyond this date. While there was general agreement that changes were needed to the project to ensure its long-term sustainability, stakeholders were concerned that near term changes (such as lower rebate amounts) could have unintended market consequences, and that any changes should be analyzed before being implemented. Unintended market consequences may be disruptive given that the zero-emission vehicle market is at a critical point as it matures and transitions beyond early adopters. Although vehicle manufacturers are responding to market needs by offering lower price points, rebates can be a deciding factor in many consumers' economic ability to purchase or lease these cleaner vehicles. Based on these considerations and stakeholder feedback, at this time staff is not proposing any significant changes to the Clean Vehicle Rebate Project as part of this year's initial Funding Plan.

While significant program changes are not being initially proposed as part of this year's funding plan, staff is intending to immediately undertake a focused process with stakeholders to develop a sustainable long-term vision for the program. This effort will include the discussion of options to better align the Clean Vehicle Rebate Project with the near-term deployment needs of current technologies that are in the process of transitioning into mainstream consumer choices (such as battery electric vehicles), the identification of metrics for when these technologies no longer need public incentives in the primary and secondary marketplace, and on the long-term needs for newer technologies where public investment may be needed for years to come (such as hydrogen fuel cell vehicles). Public incentives remain critical for ensuring the long-term affordability and effective fleet turn-over by reducing production costs of advanced technology vehicles through spurring higher, more efficient production volumes; and accelerating consumer acceptance of new unfamiliar vehicle technologies. Staff is proposing to return to the Board by the end of 2013 to provide a status update on the progress made with stakeholders to develop a sustainable and more effective vision for the Clean Vehicle Rebate Project, and to present any appropriate recommendations for program changes.

Staff is proposing a $5 million minimum allocation for the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, which is expected to fund approximately 150 vehicles. With the relatively low availability of funds dedicated to the fiscal year 2013-14 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, staff recommends limiting each fleet to no more than 100 vouchers in fiscal year 2013-14, down from the current limit of 200 vouchers per fiscal year, to ensure no single fleet receives all of the project funds. Staff does not believe this will have an impact on fleets because no single fleet has ever requested more than 100 vouchers in a year. Staff is also proposing various technical changes to the project, including strengthening the three-year warranty requirements and offering higher voucher amounts for fast charge compatible vehicles. These changes aim to further the deployment of more advanced and robust hybrid and zero-emission technologies and ensure available funding to a diversity of fleets.

Advanced technology demonstrations remain a critical element of AQIP because they accelerate commercialization and deployment of cleaner technologies in broader applications and across multiple sectors. In support of this, a $3 million minimum allocation is proposed for advanced technology demonstrations, of which $1 million is intended to fund a Zero Emission Transit Demonstration Project that was not funded previously due to insufficient revenues in fiscal year 2012-13.

ARB staff envisioned that these project categories, including the Clean Vehicle Rebate Project, would be funded for multiple years in order to maintain continuity and provide a larger overall impact on the selected technologies. Continuing investments in the next generation of vehicles, equipment, and emission controls is critical to meet California's long-term air quality goals and will help start the transformation of the California fleet to one with widespread use of advanced technology near-zero and zero-emission vehicles.

Additionally, AQIP provides one of a limited number of funding sources available to offer financing solutions to a wide range of small business truckers through the Truck Loan Assistance Program. The Truck Loan Assistance Program is the only incentive funding source available to truck owners for assistance with purchasing cleaner vehicles ahead of regulatory compliance schedules for existing in-use fleet rules. For fiscal year 2013-14, ARB staff proposes a $2 million minimum allocation for truck loans, which could result in approximately 300 loans for clean vehicles and/or equipment.

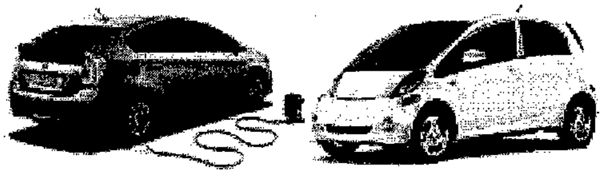
ARB staff forecasts that AQIP fees could generate up to $25 million in project revenue, after accounting for various state administrative costs. Should project revenue materialize in this amount, then roughly an additional $5 million would be available for allocation to the above projects. Staff believes this approach allows ARB to be more responsive to changes in market demand, while committing to minimum funding levels for stakeholder planning purposes. Section D of this Chapter identifies staff's recommended contingency plans, including how to allocate revenue received above the minimum allocations identified.

B. Description of Project Categories Proposed for Fiscal Year 2013-14 Funding

This section describes each project category proposed for funding in fiscal year 2013-14.

Clean Vehicle Rebate Project

CLEAN VEHICLE
REBATE PROJECT



Minimum Funding Target: $10 million

Synopsis: Consumer rebates for zero-emission and plug-in hybrid light-duty vehicles.

Project Benefits:

- Support transportation sector emission reductions needed in the post-2020 timeframe.
- Spur commercialization of the cleanest vehicles available.

Overview: The Clean Vehicle Rebate Project provides vehicle rebates on a first-come, first-served basis to California residents, businesses, non-profit organizations and government entities that purchase or lease a battery, fuel cell, or a plug-in hybrid electric vehicle. This program helps to get the cleanest vehicles on the road in California by providing consumer rebates to partially offset the higher initial cost of these advanced technologies. The early investment in clean vehicle technologies will prime the market for the large number of vehicles needed over the next decade and beyond to meet the State's air quality standards and climate change goals, and Governor Brown's Executive Order B-16-2012, which establishes zero-emission vehicle benchmarks by 2020. ARB's investments through the Clean Vehicle Rebate Project — coupled with corresponding investments in vehicle charging and fueling infrastructure by the CEC, and regional and federal governments — are enticing manufacturers to focus early advanced vehicle deployments in California.

The project has adapted over the last four funding cycles to incorporate lessons learned through project implementation and in response to the evolving clean vehicle market. Adaptations implemented in previous fiscal years include:

- Reducing rebate amounts in fiscal year 2011-12 in order to extend vehicle funding, while still providing meaningful incentives

- Capping the number of rebates per rebate recipient

- Reducing ownership to a one-year minimum for rental and car share fleets

- Establishing waiting list contingencies to bridge short-term funding gaps

Current rebates range from up to $2,500 for full functioning zero-emission vehicles (ZEV) and $1,500 for plug-in hybrid vehicles (PHEV), and $900 for zero-emission motorcycles (ZEM) and neighborhood electric vehicles (NEV).

Status Update: The Clean Vehicle Rebate Project launched in March 2010, and has since issued over 22,000 clean vehicle rebates, totaling $55.8 million in funding. In the first 4 AQIP funding cycles, ARB allocated a total of $49.3 million for the project and CEC provided an additional $6.5 million through their AB 118 funds. For fiscal year 2012-13, the total funding was $28.5 million, which includes $18 million originally allocated in the Funding Plan, $6 million transferred from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, and $4.5 million from the CEC. As of March 12, 2013, the project had depleted all available funding, and applications submitted were placed on a waiting list. To help bridge the gap between this year's and next year's funding, an additional $8 million from CEC for fiscal year 2012-13 was approved by the Commission on June 12, 2013, bringing the total CEC investment to $12.5 million, and the total Clean Vehicle Rebate Project allocation to $63.8 million.

While project funding became available in March of 2010, the number of rebate applications per month was consistently low until the launch of the Nissan LEAF in early 2011. As a result, fiscal year 2009-10 funds were carried over into fiscal year 2010-11. From April to June 2011, rebate applications doubled each month resulting in approximately 82 percent of total fiscal year 2009-2011 rebate funding allocated during this four month period. Rebate funding for fiscal year 2011-12 was exhausted in mid-June 2011, after which a waiting list began. Table III-2 details the historical investment made toward the Clean Vehicle Rebate Project to date.

Table III-2: Clean Vehicle Rebate Project Investment History (as of May 12, 2013)

Fiscal Year	Total CVRP Funding (Millions)			Rebates Issued (Thousands)
	ARB	*CEC*	***Total***	
2009-10	$4.1	$0.0	***$4.1***	1,980
2010-11	$5.0	$2 .0	***$7.0***	
2011-12	$16.2	$0.0	***$16.2***	8,060
2012-13	$24.0	$4.5[1]	***$28.5***	14,300
Totals:	$49.3	$6.5	***$55.8***	24,340

[1] Does not include $8 million, approved by CEC on June 12, 2013.

As articulated by stakeholders to the Board over the years, consumers, automakers, and dealerships attribute the program's success largely to its simplicity and fast payment (as compared to the $7,500 federal tax credit). The vast majority (over 90 percent) of rebate recipients are individual consumers. Of the rebates issued, about 51 percent have gone toward zero-emission vehicles and 47 percent toward plug-in hybrid electric vehicles (with the remainder going towards zero emission motorcycles, neighborhood electric vehicles, and commercial zero-emission vehicles from the first year of the program.). However, the percent of funds expended, for electric vehicles and plug-in hybrid electric vehicles is 66 percent and 31 percent, respectively, due to the higher rebate amount for zero-emission vehicles. Currently, 21 manufacturers have rebate-eligible vehicles, some with multiple models. The list of rebate-eligible vehicles continues to expand, and currently includes 29 different makes and models covering a wide range of different price points. For a complete list of eligible vehicles, rebate amounts and information about the Clean Vehicle Rebate Project, visit www.energycenter.org/CVRP.

Status of Zero-Emission Vehicle Deployment in the San Joaquin Valley

Because rebates have historically been concentrated in the San Francisco, Los Angeles, and San Diego regions, the Board directed staff to increase outreach efforts in the San Joaquin Valley in an effort to increase consumer participation. In March 2012, the San Joaquin Valley Air Pollution Control District (SJVAPCD) launched the *Drive Clean Rebate Program*, to provide further incentive to consumers within the region. Since the launch of the SJVAPCD's program, the Clean Vehicle Rebate Project has experienced an uptick in rebate activity for the San Joaquin Valley. As of April 8, 2013, 329 rebates had been issued in the region (equivalent to 2 percent of total rebates in the Clean Vehicle Rebate Project) and 250 of those rebates occurred after the launch of the Drive Clean Rebate Program. Of the total rebates issued in the SJVAPCD, 194 were for zero-emission vehicles, 127 for plug-in hybrid electric vehicles, 5 were for zero-emission motorcycles and 3 were for neighborhood electric vehicles. The staff of ARB and SJVAPCD continue to coordinate program outreach to consumers and dealerships to increase public awareness of this successful program.

The SJVAPCD also administers their Public Benefit Grant Program which provides up to $20,000 per public fleet vehicle, and up to $100,000 per fleet. They are currently the only district to offer incentives of this kind. These incentives may also be combined with Clean Vehicle Rebate Project incentives. ARB and SJVAPCD staff will continue to promote both rebate programs through targeted outreach to public fleets within the Valley.

Rebate Project Implementation

The non-profit California Center for Sustainable Energy, selected via competitive solicitation, continues to administer the Clean Vehicle Rebate Project statewide. Their responsibilities include project website development and maintenance, rebate processing and check issuance, consumer outreach and education, data reporting, and other duties associated with day-to-day implementation.

Rebates through April 30, 2013: Figure III-1 illustrates the trends in rebate activity under the Clean Vehicle Rebate Project, and Table III-3 provides a cumulative rebate summary by vehicle type and model since the project's inception. The rebate project was launched in March 2010, and rebate activity first spiked with the release of the Nissan LEAF in early 2011. Another rebate spike occurred in March 2012 after the commercial release of plug-in hybrid electric vehicles. Demand increased throughout 2012, and continues to grow with over 2,000 rebates issued in March and April of 2013.

Figure III-1: Clean Vehicle Rebates Issued by Month

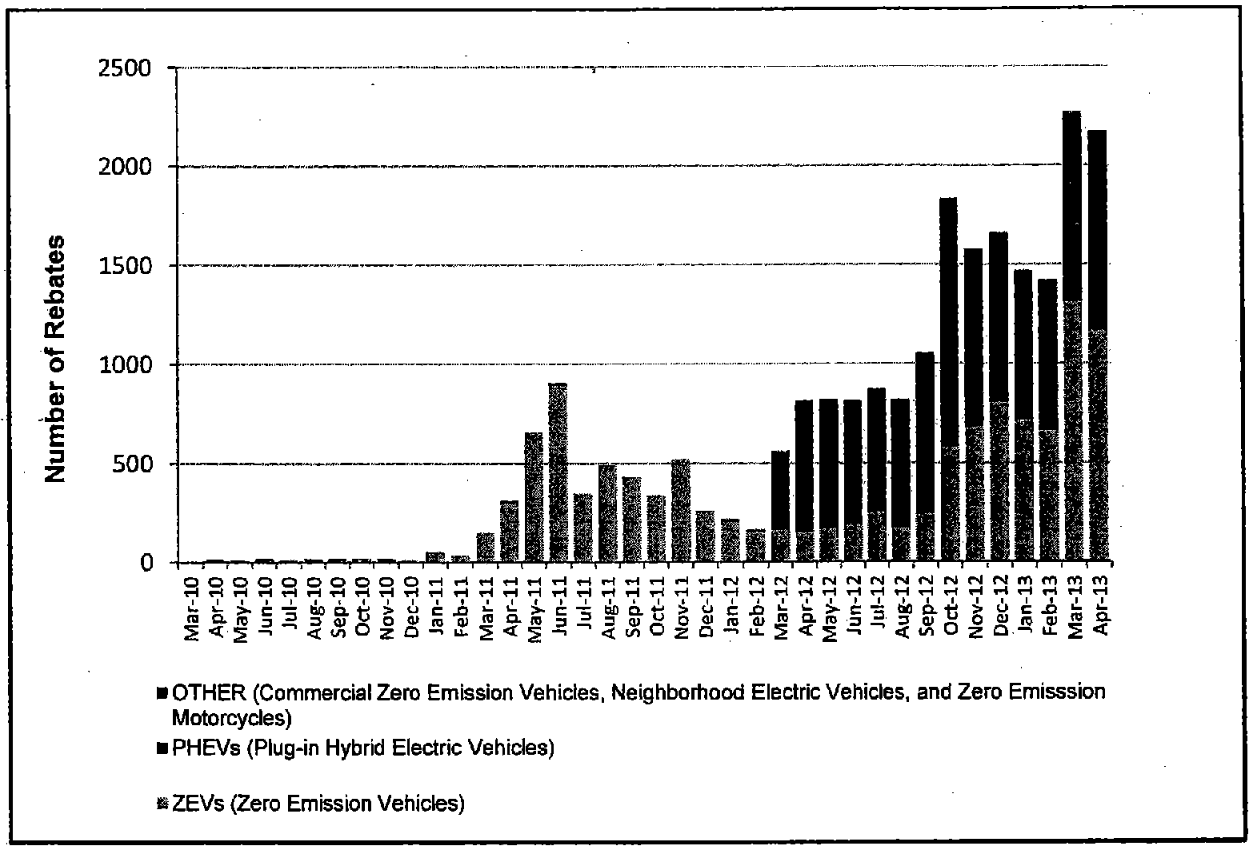


Table III-3: Clean Vehicle Rebates Issued by Vehicle Type and Model

Vehicle Type By Model	Number of Rebates	Total Dollars Allocated
Light-Duty Zero-Emission Vehicle	**11,552**	**$32,905,488**
BMW 1 Series Active E	70	$52,500
CODA	48	$120,000
Ford Focus Electric	426	$1,065,000
Honda FCX-Clarity	10	$45,000
Honda 2013 Fit EV	72	$180,000
Mercedes-Benz F-Cell	3	$7,500
Mitsubishi i-MiEV	116	$230,061
Nissan LEAF	7,924	$23,920,390
smart ED	338	$663,000
Th!nk City 2011	49	$116,037
Tesla Roadster	156	$660,000
Tesla Model S - 60 kWh battery	411	$1,027,500
Tesla Model S - 85 kWh battery	1,713	$4,282,500
Toyota RAV4 EV	215	$534,000
Wheego LiFe	1	$2,000
Plug-In Hybrid Electric Vehicle	**10,367**	**$15,529,500**
Chevy Volt Low Emission package	5,394	$8,087,850
Ford CMAX Energi	310	$465,000
Ford Fusion Energi	75	$112,500
Honda Accord Plug-In	15	$22,500
Toyota Prius Plug-In Hybrid	4,573	$6,841,650
Zero Emission Motorcycle	**148**	**$159,400**
Brammo	19	$21,300
Vectrix	5	$6,900
Zero	124	$131,200
Neighborhood Electric Vehicles	**93**	**$102,550**
GEM	57	$56,950
Miles EV	35	$44,100
Vantage	1	$1,500
Commercial Zero Emission Vehicles	**49**	**$980,000**
Navistar eStar 300	10	$200,000
Smith Newton1-9	39	$780,000
TOTAL	**22,209**	**$49,676,938**

Funding Needs: Under its current structure, the anticipated funding need for the Clean Vehicle Rebate Project in fiscal year 2013-14 is between $40 and $60 million. This projection is based on a continuation of the last 6 months of rebate disbursement volumes, as well as potentially higher funding needs driven by increases in consumer demand associated with new model releases, higher vehicle production volumes, and an increase in new car sales. Table III-4 presents data on the number of rebates issued by month between November 2012 through April 20, 2013 for zero-emission vehicles and plug-in hybrid electric vehicles. Zero-emission motorcycles and neighborhood electric vehicles combined comprise only about one percent of the rebate total and are not included in the table.

Table III-4: Recent Rebates Issued, by Month

	Month	Vehicles Rebated		Funds Expended
		Zero-Emission Vehicles	Plug-In Hybrid Electric Vehicles	
2012	November	681	894	$3,043,500
	December	806	851	$3,291,500
2013	January	730	776	$2,989,000
	February	652	759	$2,768,500
	March	1366	986	$4,894,000
	April	1164	948	$4,332,000
Average Monthly Expenditure				**$3,553,083**

Under the project's current rebate structure, AQIP funding alone will not be sufficient to fully meet the anticipated consumer demand of $40-$60 million for fiscal year 2013-14. Without any changes to the current project, a base funding amount of $10 million could be expected to last just a few months. The anticipated allocation of $5 million to the Clean Vehicle Rebate Project from the CEC in its proposed fiscal year 2013-14 Investment Plan is expected to extend rebate availability into the fall of 2013, but the gap between demand and available funds is still substantial.

In addition, demand for clean vehicles is expected to increase significantly over the next several years as more models come to market, the number of mid-range priced vehicles expands, and consumer acceptance of advanced technologies increases. Although vehicle manufacturers are responding to market needs by offering lower price points, rebates remain a deciding factor in many consumers' economic ability to purchase or lease these cleaner vehicles. Also, a pre-owned market for clean technology vehicles is starting to emerge, which may help to spur electric vehicle penetration in lower income populations and disadvantaged communities that are less likely to make new vehicle purchases. Because achieving California's long term 2050 greenhouse gas reduction goals in the light-duty vehicle sector means nearly all new vehicle sales by the 2040 model year must be ZEVs and PHEVs, the combination of both monetary and non-monetary consumer incentives remains critical in the near term to achieve these goals.

Staff Proposal: As part of the public process for developing this year's Funding Plan, staff engaged the public on potential options for modification to the Clean Vehicle Rebate Project in order to better ensure the sustainability of the project over the next several years. Staff participated in discussions with vehicle manufacturers, consumer advocates and other industry stakeholders, and held a Clean Vehicle Rebate Project Work Group teleconference on April 24, 2013. Stakeholders acknowledged that the current structure of the project is unsustainable, but were concerned that near term changes (such as lower rebate amounts) could have unintended market consequences, and that any changes should be analyzed before being implemented. As a result of these discussions, staff is not proposing any significant modifications to the project at this time, but staff continues to actively engage stakeholders and the public to determine the best structure for the project long-term. A discussion of the next steps in this process can be found at the end of this section.

Staff is proposing a $10 million minimum funding allocation for the Clean Vehicle Rebate Project, combined with an additional $5 million approved by the Energy Commission in May 2013 in its fiscal year 2013-14 Investment Plan. Staff is also proposing a few minor administrative changes to the Clean Vehicle Rebate Project that include standardizing zero-emission vehicle rebates, maintaining a set-aside for public fleets, and adjusting maximum rebates per consumer type. Because available funding is expected to be exhausted no later than midway into fiscal year 2013-14, no waiting list provision is proposed.

Standardized ZEV Rebates

Staff proposes standardizing rebate amounts for all ZEVs with a minimum 50-miles range or greater. Standardizing the ZEV rebate amount simplifies the project for consumers and eliminates the sales advantage a higher rebate amount gives to ZEVs rated Type II and above (vehicles with a range of 100 miles or more). More specifically, consumers often confuse the vehicles miles per gallon equivalent (MPGe) rating provided by the Environmental Protection Agency (EPA) with the electric driving range, and often don't understand why a particular vehicle receives less in rebates than another. Further, ARB and EPA use different tests for determining electric driving range, which also adds to confusion at the consumer level. Currently, very few vehicle models below Type II are available in California's market and less than 5 percent of total ZEV rebates to date have gone to ZEVs below Type II.

Table III-5 details how this technical change would apply to ZEV rebates.

Table III-5: Proposed FY 2013-14 Standardized ZEV Rebate Amounts

Vehicle Type	Current Rebate	Standardized Rebate	Standardized Rebate Under Rental & Car Share Reduced Ownership Option
ZEV			
Type II, III, IV, or V (range ≥100 miles)	$2,500	$2500	$750
Type I.5 (range ≥75, <100 miles)	$2,000		
Type I (range ≥50, <75 miles)	$1,500		
BEVx[2]	$1,500		

[1] BEVx is a new regulatory category of battery electric vehicle with a small range extending auxiliary power unit.

No Waiting List Provision

Staff does not recommend the continuation of a waiting list provision in this fiscal year's project. While stakeholders support a waiting list because it provides funding certainty during gaps between funding cycles, it is only appropriate when acting as a modest investment to bridge a short-term funding gap. Given the magnitude and timing of the funding shortfall this fiscal year, a waiting list would not be sustainable.

Public Fleet Set-Aside

To date, public fleet participation in the Clean Vehicle Rebate Project has been low. Impediments to clean vehicle penetration in public fleets include:

- Agency fiscal constraints
- Higher capital costs compared to traditional gas vehicle counterparts
- Charging/refueling infrastructure requirements
- Inability to access the $7,500 federal tax credit for clean vehicle purchases

To support public fleet participation in the Clean Vehicle Rebate Project, staff proposes a $200,000 set-aside specifically for public agencies (federal, state, county, regional and municipal). While comprising only 1 percent of the total project funding, this set-aside would be sufficient to fund an amount of vehicles equivalent to the total number of public fleet vehicles rebated under the project to date. Staff would monitor the draw down throughout the fiscal year and remaining funds would be reallocated back into the rebate account if unused.

Adjust Maximum Number of Rebates per Consumer Type

In response to limited rebate availability, staff proposes to adjust the maximum number of rebates per consumer type for each funding year as shown in Table III-6. Historically, most individuals have not applied for more than two rebates; therefore staff is proposing to reduce the allowed rebates from 20 to 2. For rental fleets, although some fleets have met their maximum allowed rebates, staff believes a reduction from 50 to 20 will allow more fleets to participate.

Finally, staff recommends increasing the public fleet limit to better allow public fleets to utilize in the Clean Vehicle Rebate Project (representing less than 4 percent to date), and public fleets need this flexibility to help meet the Governor's Executive Order goal of reaching 10 percent of state fleet purchases zero-emission vehicles by 2015.

Table III-6: Proposed Maximum Number of Rebates per Consumer Type

Consumer Type	Number of Rebates Currently Allowed	Maximum Number of Rebates Proposed
Individual	20	2
Public Fleet	20	30
Rental Fleet	50	20
Car Share	Unlimited	20

Grantee Solicitation

Staff proposes to issue the solicitation for a grantee to administer the Fiscal Year 2013-14 Clean Vehicle Rebate Project shortly following Board approval of the Funding Plan and passage of the annual State Budget. The same competitive process and eligibility requirements will be used as in previous funding years; the solicitation will be open to individuals, federal, state, and local government entities and agencies, and non-profit organizations with experience implementing a rebate program and general knowledge of statewide outreach and implementation. Consistent with previous years, staff proposes allowing up to 10 percent of the project funding to be used for administration and outreach.

Long-term Light-duty Advanced Technology Incentive Needs: As discussed above, rapid market and program success have led to a funding shortfall in the current fiscal year, and projections are showing significant shortfalls in future years if the program is not adjusted or if funding levels are not dramatically increased and stabilized. To ensure that the Clean Vehicle Rebate Project can be a viable project moving forward, ARB staff believes that the vision for the project should be predicated on a multi-year stable and predictable source of funding and should cover a continuum of technologies. Staff plans to continue dialogue with stakeholders, placing a strong focus on defining incentive needs, identifying program metrics and priorities, and designing the most viable structure for the project. More specifically, staff will seek input on near-term needs for current technologies that are in the process of transitioning into mainstream consumer choices, and long-term needs for newer technologies that will need public support for years to come. Staff will return to the Board by the end of 2013 to provide a status update on the progress made with stakeholders to develop a sustainable vision, and at that time, staff may present appropriate recommendations for near-term changes to the program.

Hybrid and Zero Emission Truck and Bus Voucher Incentive Project

Minimum Funding Target: $5 million

Synopsis: Offers vouchers to help California fleets purchase new hybrid and zero-emission trucks on a first come, first-served basis.

Project Benefits:

- Ensure a California market for early deployment of advanced heavy-duty vehicle technologies needed for the State to meet its air quality and climate change challenges, while reducing toxic emissions.
- Provide incentive for truck and bus manufacturers to develop and deploy the next generation of advanced technologies.

Overview: The Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project offers vouchers to help California fleets purchase new hybrid and zero-emission trucks on a first come, first-served basis. Hybrid and zero-emission vehicle technologies have the potential to reduce criteria pollutant, air toxic, and greenhouse gas emissions – particularly in urban delivery vehicles, refuse trucks, work trucks, buses, and other vehicles with high stop-and-go or idling duty cycles. This project is intended to spur early production volumes for these vehicles and lower long-term production costs, and serves as a successful example for other states and localities.

Status Update: While Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project voucher demand was high in the first year of the project, fleet participation in subsequent years was slower than expected. Discussions with participating fleets and other project stakeholders suggest several challenges contributed to reduced voucher demand:

- Several early adopter fleets indicated they saturated their demand for new delivery trucks with stop-and-go routes that would benefit from hybrid technology at project launch out of concerns first year funding would be depleted quickly.

- Hybrid vehicle fuel economy uncertainties and the shortage of long-term vehicle performance and benefits data have made it difficult to entice the next generation of potential early adopters.

- The low cost of natural gas fuel make natural gas-powered trucks a more attractive option relative to hybrids for fleets' limited "green vehicle" funding.

- The next iteration of early adopter fleets (particularly medium and small fleets) are more risk averse and less likely to purchase new vehicle technologies they are unaccustomed to and which they perceive to be potentially less reliable or predictable.

To address these deployment issues, the Board approved several program refinements as part of the fiscal year 2012-13 AQIP Funding Plan to stimulate near-term demand, including increased voucher amounts for zero-emission vehicles and advanced technology hybrids. In addition, Hino Motor Company (Hino), a vertically integrated hybrid truck manufacturer owned by Toyota, entered the California market in October 2012 with a more economical hybrid in the 14,001 to 19,500 pounds (lbs) gross vehicle weight range (GVWR). Hino trucks are being purchased by smaller fleets that had not previously purchased hybrid vehicles. As a result, voucher demand has increased in response to program changes and the addition of Hino as an economical purchase option, with voucher demand in the fourth quarter of 2012 more than tripling that of fourth quarter 2011.

As of May 15, 2013, the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project has provided vouchers for the purchase of 1,217 hybrid and 370 battery-electric zero-emission trucks and buses, mostly in urban beverage and package delivery vocations. Approximately $3 million in funds remain as of this date, with funds likely to be depleted this summer. Staff does not recommend a waiting list should funds be exhausted prior to launch of the fiscal year 2013-14 project this fall.

Funding Needs: Staff expects a significant increase in funding demand over the next year. Demand from medium and smaller fleets for hybrid trucks is expected to drive overall project demand during this time period. Table III-7, provides staff's preliminary projections of potential voucher demand between the beginning of fiscal year 2013-14 and the end of August 2014, when new fiscal year 2014-15 project funds could potentially become available. The range of potential voucher demand (between "Low and "High" projections) is based upon discussions with vehicle manufacturers and California fleets, and considers the possibility of co-funding from Proposition 1B: Goods Movement Emissions Reduction Program (Goods Movement Program) and other market variables. The "High" projection assumes about 80 percent of manufacturer projections of project-eligible vehicles manufactured for the California market, with significant fleet demand for hybrid trucks and zero-emission vehicles co-funded by the Goods Movement Program. The "Low" projection more closely mirrors project demand over the past 2 quarters, after program changes increasing the voucher amount for zero-emission vehicles were implemented, and the market introduction of the Hino hybrid.

Table III-7: Projected Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project Funding Demand

	July – December 2013			January – August 2014			Total
	No. of Vehicles	Avg. $ /Vehicle	Total Funding	No. of Vehicles	Avg. $ /Vehicle	Total Funding	
Low	200	$25,000	$5M	280	$25,000	$7M	$12M
High	300	$33,000	$10M	450	$33,000	$15M	$25M

Continued incentive funding for these advanced technology trucks and buses will be critical to ensure these vehicles' acceptance and accelerate their deployment to help California meet its air quality and climate change goals.

Staff Proposal: Staff proposes maintaining the existing fiscal year 2011-12 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project structure and vehicle voucher amounts, as these have provided a successful, steady and predictable driver for California's hybrid and zero-emission commercial vehicle market. However, staff recommends some minor adjustments to further incentivize deployment of more advanced and robust hybrid and zero-emission vehicle technologies, and ensure available funding to a diversity of fleets. Proposed changes target the next generation of early adopter fleets that have not previously considered purchasing hybrid or zero-emission trucks or buses, with strategies such as providing incentives for extended warranties and facilitating fleets' access to the Goods Movement Program co-funding. Staff's recommendations are described below.

Limit of 100 Vouchers Per Fleet

Staff recommends limiting each fleet to no more than 100 vouchers in fiscal year 2013-14, down from up to 200 vouchers per fiscal year (as shown in Table III-8 and III-9), due to the relatively low availability of funds dedicated to the fiscal year 2013-14 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project. No single fleet has ever requested more than 100 vouchers in any single fiscal year. However, reducing the limit from 200 to 100 will ensure no single fleet receives all fiscal year 2013-14 project vouchers. Staff recommends allowing flexibility for the Executive Officer to adjust the limit per fleet back to 200 if the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project receives an influx of at least $10 million in additional funding, or if project funding is not depleted by June 30, 2014.

Table III-8: Zero-Emission Truck and Bus Voucher Amounts

Gross Vehicle Weight Rating (lbs)	Base Vehicle Incentive[1]	
	1 to 100 vehicles	~~101 to 200 vehicles~~
5,001 – 8,500	$12,000	~~$10,000~~
8,501 – 10,000	$18,000	~~$12,000~~
10,001 – 14,000[2]	$30,000	~~$20,000~~
14,001 – 19,500	$35,000	~~$25,000~~
19,501 – 26,000	$40,000	~~$30,000~~
> 26,000	$45,000	~~$35,000~~

The first three vouchers received by a fleet are eligible for the following voucher enhancements: $2,000/vehicle if below 8,501 lbs; $5,000/vehicle if 8,501 to 10,000 lbs; and $10,000/vehicle if over 10,000 lbs.

1 - A zero-emission school bus is eligible for the same additional funding as a hybrid school bus as identified in Table III-9.

2 - This weight range is not intended for vehicles utilizing a pick-up truck chassis/platform typically found in vehicles below 10,001 lbs GVWR. Vehicles at the lower end of the 10,001 to 14,000 lbs weight range will be evaluated on a case-by-case basis to determine eligibility for the full $30,000 Base Vehicle Incentive.

Table III-9: Eligible Hybrid Truck and Bus Voucher Amounts

Gross Vehicle Weight Rating (lbs)[1]	Base Vehicle Incentive	
	1 to 100 vehicles	~~101 to 200 vehicles~~
6,001 – 8,500 (plug-in hybrids only)[2]	$ 8,000	~~$ 6,000~~
8,501 – 10,000 (plug-in hybrids only)[2]	$10,000	~~$ 8,000~~
10,001 – 19,500	$15,000	~~$10,000~~
19,501 – 33,000	$20,000	~~$12,000~~
33,001 – 38,000	$25,000	~~$15,000~~
> 38,000	$30,000	~~$20,000~~

The first three vouchers received by a fleet are eligible for the following voucher enhancements: $2,000/vehicle if below 8,501 lbs; $5,000/vehicle if 8,501 to ~~10,000~~19,500 lbs; and $10,000/vehicle if over ~~10,000~~ 19,500 lbs.

1 – Tractor trailers utilize Gross Combined Vehicle Weight for purposes of determining Base Vehicle Incentive.

2- Vehicle must be ARB-certified as an Ultra-Low Emission Vehicle (ULEV). Voucher amount is increased by $2,000 for each of the following: ARB-certification as a Super Ultra Low Emission Vehicle (SULEV) and ARB-certification for zero-evaporative emissions.

Maintain Existing Base Voucher Amounts

Staff does not recommend changes to the existing Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project voucher amounts identified in Tables III-8 and III-9 (above). These voucher amounts, in conjunction with additional 'bump-ups' identified in Tables III-9 and III-10, provide the transparent and predictable incentives that helps manufacturers to develop and deploy advanced technology commercial vehicles in California, and for California fleets to consider purchase of these new technologies. However, staff does propose reducing the voucher enhancement for the first three vouchers per fleet from $10,000 to $5,000 for hybrid vehicles between 10,001 and 19,500 lbs GVWR (See footnote for Table III-8, below). Staff believes the lesser $5,000 voucher enhancement for the first three vouchers per fleet is sufficient for vehicles between 10,001 and 19,500 lbs GVWR due to the market penetration of the more economical Hino hybrids among smaller fleets.

Higher Voucher Amounts for Fast Charge Compatible Vehicles

Table III-10 identifies voucher 'plus-ups' approved by the Board last year as part of the fiscal year 2012-13 AQIP Funding Plan, as well as staff's proposal to include zero-emission fast charge-compatible vehicles as eligible for one half the voucher enhancements as hydrogen fuel cell vehicles (See the <u>underlined</u> proposed update in Table III-10). Staff proposes providing zero-emission vehicles that are compatible with fast charging infrastructure with an additional voucher amount due to their "unlimited" daily range relative to traditional slow charge vehicles. Zero-emission fast charge vehicles would receive half the hydrogen fuel cell vehicle enhancement voucher amount due to fast charge technology's lower relative incremental cost.

Table III-10: Vehicle Voucher Enhancements[1]

<table>
<tr><th>Gross Vehicle Weight (lbs)</th><th>Plug-in or Hydraulic Hybrid[2]</th><th>School Bus[3]</th><th>ARB Certification (full vehicle)</th><th><u>Zero-Emission</u> <u>Fast Charge/</u> Hydrogen Fuel Cell Vehicles</th></tr>
<tr><td>5,001 – 10,000 (plug-in hybrids only)</td><td>NA</td><td rowspan="2">$ 5,000</td><td rowspan="2">NA</td><td rowspan="3"><u>$10,000/</u>$20,000</td></tr>
<tr><td>10,001 – 14,000</td><td>$5,000</td></tr>
<tr><td>14,001 – 19,500</td><td rowspan="4">$10,000</td><td rowspan="4">$10,000</td><td rowspan="2">$15,000</td></tr>
<tr><td>19,501 – 33,000</td><td><u>$15,000/</u>$30,000</td></tr>
<tr><td>33,001 – 38,000</td><td rowspan="2">$20,000</td><td rowspan="2"><u>$20,000/</u>$40,000</td></tr>
<tr><td>> 38,000</td></tr>
</table>

1 - The total of all advanced technology vehicle subsidies, including the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project Base Vehicle Incentive and voucher enhancements identified in Tables III-9 and III-10 may not exceed the assumed vehicle incremental cost.
2 – Plug-in electric or hydraulic hybrid vehicles must demonstrate at least a 40 percent fuel economy benefit relative to their non-hybrid counterpart as part of their Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project eligibility application.
3 - Zero-emission school buses are also eligible for this voucher enhancement.

Eligibility criteria for the fast-charge vehicle voucher enhancement would be based upon factors such as potential vehicle miles per day, technology reliability, and technology incremental cost, and would be developed in consultation with the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project Work Group.

Goods Movement Program Set-Aside

The Goods Movement Program has established criteria for co-funding of electric trucks that are also eligible for Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project vouchers. To help ensure vouchers will be available for participating vehicles at the end of the Goods Movement Program solicitation and grant agreement process, staff recommends setting aside a portion of the fiscal year 2013-14 Hybrid and

Zero-Emission Truck and Bus Voucher Incentive Project funding allocation for vehicles that also receive Goods Movement Program co-funding. Since staff won't know Goods Movement Program demand for zero-emission trucks until after the June 27, 2013 Board meeting, staff recommends determining what percentage of Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project funds to set aside through the pubic work group stakeholder process prior to fiscal year 2013-14 project launch this Fall.

Should Goods Movement Program demand exceed Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project funds set-aside, staff recommends allocating Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project set-aside funds regionally in a manner consistent with the relative Goods Movement Program trade corridor funding allocations approved by the Board on February 28, 2008. To ensure funds are not set aside indefinitely while Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project demand from other fleets remains unmet, fleets requesting Goods Movement Program set-aside funds must have a signed contract with the applicable air district and have requested a voucher for the zero-emission truck by January 15, 2014, or by the time Hybrid and Zero-Emission Vehicle Truck and Bus Voucher Incentive Project funds are exhausted, whichever is later.

First Three Vehicles' Voucher Enhancement to Include Previous Year Purchases

Current voucher enhancements of up to $10,000 per vehicle for the first three vouchers per fleet are intended to further encourage a diversity of fleets to purchase a hybrid or zero-emission truck or bus. In previous funding years, a fleet would be eligible for the additional voucher amount for the first three vehicles in each funding year, even if it had received this incentive in previous funding years. To help funding stretch further and better serve new and smaller fleets, staff proposes that only the first three vouchers per fleet inclusive of all funding years would be eligible for the additional voucher enhancement beginning in fiscal year 2013-14. For example, if a fleet had received three or more vouchers in a previous funding year, it would be ineligible to receive the voucher enhancement for the first three vouchers in the fiscal year 2013-14 program.

Staff also proposes allowing the voucher enhancement of up to $10,000 per vehicle to be applied on a technology specific basis (hybrid, zero-emission plug-in electric, or zero-emission fuel cell), since one purpose of this project is to encourage fleets to consider new, advanced technologies when buying a new truck or bus. For example, fleets that had previously received vouchers for its first three hybrid vehicles would still be eligible for the voucher enhancement for its first three zero-emission plug-in electric or fuel cell vehicles.

Require Stronger Three-Year Warranty

Staff proposes strengthening warranty requirements to specify that the manufacturer warranty must cover not just the vehicle battery but the entire vehicle, including the engine (if applicable), motor, drive train, battery, parts and labor for a full three year period. The requirement that eligible vehicles have a minimum 50,000 mile warranty would also be evaluated and strengthened as needed. Enhanced vehicle and component warranty requirements for the project would be developed in coordination with the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project work group prior to launch of fiscal year 2013-14 project funding.

Enhanced Voucher for Extended Warranties

Staff also recommends an additional incentive amount for extended vehicle warranties that would provide purchasing fleets with certainty regarding vehicle reliability, maintenance costs, and battery life. Staff recommends an additional $2,000 voucher amount for each year of warranty coverage from years six to ten and/or mileage coverage above a certain threshold. For example, a hybrid or zero-emission truck with a 6-year manufacturer warranty would receive an additional $2,000 voucher, a 7-year warranty would translate into an additional $4,000 voucher. This additional incentive reflects about half the cost of extended warranty coverage, and was developed with manufacturer input regarding what additional voucher amount would motivate them to offer extended warranties. Staff will evaluate and discuss minimum warranty requirements – such as minimum mileage per additional warranty year, warranty terms, and responsible entity or entities – during a Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project work group meeting prior to launch of fiscal year 2013-14 project funding.

Determine Hybrid Vehicle Incremental Cost on a Case-by-Case Basis

Staff recommends that the assumed project incremental cost for a hybrid vehicle make/model reflect the actual specific vehicle manufacturers' incremental cost, rather than an assumed industry-wide average. Incremental cost is defined as the cost difference between a conventional new truck or bus and its hybrid or zero-emission counterpart. The existing project utilizes fixed incremental costs based on vehicle weight range and technology type, ranging from $15,000 for a 14,000 lbs GVWR truck to up to $120,000 for 38,000 lbs GVWR or heavier. Fixed incremental costs are no longer appropriate given range of costs for the variety of hybrid trucks now on the market. This recommended change would help ensure the project Base Voucher Amount plus voucher enhancements identified in Table III-10 do not exceed a hybrid vehicle's actual incremental cost.

Maintain Existing Voucher Enhancement for Early On-Board Diagnostics (OBD) Compliance

Functioning and integrated OBD systems are critical to ensure that hybrid heavy-duty vehicle emission controls work in-use as intended. Compliance with ARB's amended heavy-duty truck OBD regulation requires a progressively greater level of vehicle, engine, and drivetrain integration beginning with the 2013 engine model year. Hybrid vehicle OBD compliance requires significant cooperation and coordination between vehicle, engine, and drivetrain manufacturers in what has typically not been a vertically integrated industry. In order to incentivize early compliance with the amended heavy-duty truck OBD regulation and encourage a growing and robust California hybrid truck market, staff recommends the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project maintain the existing incentive amounts identified below in Table III-11 for each eligible hybrid truck or bus with an ARB-certified OBD system for the engine and powertrain combination.

Table III-11: Voucher Enhancements for Hybrid Vehicles with ARB-Certified OBD[1]

	Total Number of Hybrid-Related Deficiencies[2]				
	2013 /2014 MY		2015 MY		
Vehicle GVWR	**10+**	**<10**	**9-14**	**5-8**	**≤4**
14,001 - 26,000 lbs	$12,000	$16,000	$8,000	$12,000	$16,000
26,001+ lbs	$16,000	$20,000	$12,000	$16,000	$20,000

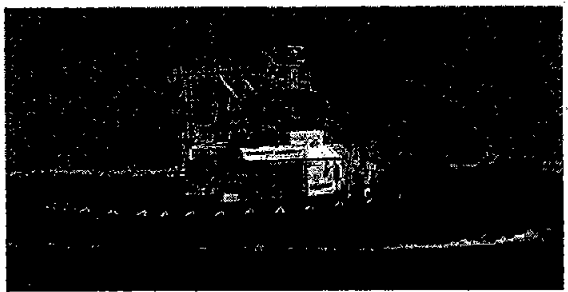
1 - Vehicles and engines certified to Title 13, CCR section 1971.1 (d)(7.6) do not qualify for these voucher enhancements.

2 – The number of deficiencies for each OBD certified hybrid vehicle is determined pursuant to the procedures identified in Title 13, CCR, section 1971.1, *On-Board Diagnostic System Requirements for 2010 and Subsequent Model Year Heavy-Duty Engines.*

Grantee Solicitation

ARB staff proposes issuing the fiscal year 2013-14 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project grantee solicitation shortly after Board approval of this Funding Plan in order to ensure new project funds are available by Fall 2013. Staff anticipates, as in prior years, that the project solicitation will be open to individuals, federal, state and local government entities and agencies, and organizations with California heavy-duty vehicle, vehicle incentive, or air quality expertise or experience. Consistent with previous years, staff recommends allowing up to 10 percent of project funds to be used for project administrative costs.

Advanced Technology Demonstration Projects



Minimum Funding Target: $3 million

Synopsis: Demonstrate the viability of advanced technology vehicles, equipment or emission controls.

Project Benefits:

- Accelerate commercialization and deployment of cleaner technologies in the California marketplace.
- Support California's goals for criteria pollutant, air toxics, and greenhouse gas emission reductions.

Overview: Advanced Technology Demonstration Projects accelerate the introduction of advanced emission reducing technologies that are on the cusp of commercialization into the California marketplace. A public investment in these technologies helps to achieve significant emission reductions of criteria pollutants and toxic air contaminants, as well as greenhouse gases, sooner than would be possible otherwise. This commitment from the State encourages industry to expeditiously invent, develop, test, and introduce cutting edge emission reducing technologies. Finally, Advanced Technology Demonstration Projects leverage public investment with private capital and ingenuity to go beyond what is currently at the technological forefront.

Advanced Technology Demonstration Projects carry inherent complexities and engineering challenges. ARB mitigates this potential by requiring a competitive selection process to award funding to the most promising technologies, requiring a significant cost share from technology demonstrators, and requiring that project applicants be a California-based public agency with expertise in the project category. Grants are awarded to public agencies to manage the day-to-day administration of the projects with ARB oversight. Typically, public agencies are local air districts, port authorities, or public school districts, but other agencies are eligible. The team concept for demonstration projects, with technology demonstrators partnering with a local public agency and one or more end-users, has proven to be effective and is planned to continue for future projects.

Status Update: Throughout the first 4 years of Advanced Technology Demonstration Projects (fiscal year 2009-10 through fiscal year 2012-13), AQIP has funded 13 separate projects totaling $5.6 million, ranging from locomotive retrofits to hybrid marine demonstrations. AQIP investment has leveraged $6.3 million in match funding from grantee and technology demonstrators resulting in a total of $12 million of demonstration funding.

The following Advanced Technology Demonstration Projects are expected to be completed before the adoption of this Funding Plan:

- *Retrofit of a Line-Haul Locomotive with a Diesel Particulate Filter:* Completed in the summer of 2012 this project was administered by the Sacramento Metropolitan Air Quality Management District who partnered with Electro-Motive Diesel (EMD) and Union Pacific Railroad. The project demonstrated that a diesel particulate filter could be installed and operated on a 2 stroke diesel-fueled medium horsepower line-haul locomotive and reduces emissions of Particulate Matter (PM) to levels significantly below US EPA Tier-4 standards. The result, Union Pacific's UP 9900, is currently in revenue operation in California, primarily between the Port of Oakland and the Roseville railyard.

  Railroads are starting to see the advantage in utilizing medium horsepower locomotives like UP 9900, for use in regional-haul, switcher service, short-haul and helper service due to their flexible nature and lower repower costs compared to new capitol purchases. Currently, the candidate population of medium horsepower locomotives in the State is potentially over 400 locomotives, with about 250 units in service with Class-One railroads, 50 or more in service with short lines and up to 130 being utilized in passenger rail, many if not most in non-attainment areas. All the above referenced locomotives could be candidates for the PM reducing retrofit once the engines have been repowered with EMD's new ECO710 engine, which employs exhaust gas recirculation to reduce Oxides of Nitrogen (NOx) emissions approaching Ultra Low Emitting or ULEL level of 3.0 g NOx per brake horsepower-hour. So far, about 20 locomotives have been upgraded with the new engine, one of which was the subject of this demonstration. One goal of the proposed Advanced Technology Demonstration Projects found in this year's Funding Plan is to build upon the advances made with UP 9900 and demonstrate reductions in NOx emissions to Tier-4 levels in medium horsepower locomotives. The Advocated Technology Demonstration Project is focusing on this horsepower segment because its power range and functionality is appropriate for the California marketplace with the goal of reaching Tier-4 in-use emission while in revenue service.

- *Hybrid Tugboat Retrofit:* This project was administered by the Port of Long Beach in conjunction with Foss Maritime Company to retrofit the tugboat, *Campbell Foss,* as a hybrid tugboat. That vessel has demonstrated significant emission reductions and is currently in operation at the Ports of Los Angeles and Long Beach. Foss Maritime has capitalized on what was learned from this project to successfully compete for funding from the United States Maritime Administration to retrofit Foss' tugboat, *Alta June*. Currently there are about 10 tugboats in the same class as the *Campbell Foss* or *Alta June* in operation that could be retrofitted with the hybrid technology, though all those tugs are not in California. The *Campbell Foss* hybrid retrofit was extremely cost effective at less than $2000 per weighted ton of criteria pollutants reduced, with emission reductions in the magnitude of 0.17 tons per day NOx, 1.7 tons per year PM, and fuel savings of about 140,000 gallons per year. Currently there are only 3 or 4 tugboats in operation, worldwide, that are utilizing this hybrid technology. There is potential for the demonstrated hybrid technology to be transferred into the other 160 tugboats in the State and further into the approximately 4,200 other harborcraft that operate in California once the technology has fully penetrated the commercial harborcraft market.

- *Retrofit of a Genset Switcher with Diesel Particulate Filter*: This project was administered by the Bay Area Air Quality Management District, with GT Exhaust as the technology demonstrator and BNSF as the railroad partner. This project is ending at the mid-point of the durability testing due to the manufacturer of the filter body, Dow Chemical, ending production of the filter. However, the locomotive with filters installed has completed its mid-point emission testing showing that the retrofit is technologically sound and reduces emissions of diesel particulate matter to below Tier-4 locomotive emission levels. Staff anticipates that other manufacturers will leverage the information gained from this project to develop more robust filter products.

- *Commercial Zero-Emission Cordless Lawn and Garden Demonstration Projects*: In June 2011, funding was awarded to three local air districts to demonstrate zero-emission lawn and garden equipment in a commercial setting. The South Coast Air Quality Management District, Mojave Desert Air Quality Management District, and the San Joaquin Valley Unified Air Pollution Control District partnered with several lawn and garden equipment manufacturers and local project participants to test a variety of lawn and garden equipment to evaluate performance. Results from the Commercial Zero-Emission Cordless Lawn and Garden Demonstration Project reported insufficient battery technology and equipment performance when compared to gas powered equipment. However, other lawn and garden equipment evaluation criteria such as noise pollution and weight were reported more favorably. As a result of this project, ARB and district staff concluded that improvements in battery technology is key to full commercialization and market acceptance of commercial zero-emission cordless lawn and garden equipment.

For fiscal year 2012-13, $2 million was allocated for demonstration projects, with a focus on zero-emission off-road equipment and zero-emission transit vehicles. The Zero-Emission Off-Road Equipment solicitation resulted in the selection of a battery-electric yard truck project for demonstration at the Port of Los Angeles and Port of Long Beach. The Ports of Los Angeles and Long Beach project is focused on demonstrating zero-emission technology in a yard hostler application with enough battery power to perform a complete shift and utilizing 2 separate trucks for back to back shifts while meeting the needs of Eagle Marine Services' port terminal. The goal of this project is to demonstrate this zero-emission technology in revenue service, with the eye on penetrating further in other port equipment with this and other zero-emission technology in future solicitations.

The Zero-Emission Transit demonstration project solicitation is proposed to be rolled over into the fiscal year 2013-14 Funding Plan due to insufficient fiscal year 2012-13 revenues. The goal of this project is to advance the pace of fuel-cell development, battery bus technology, or expand zero emission vehicles into the paratransit and shuttle bus market.

Funding Needs: AQIP investments in Advanced Technology Demonstration Projects have been modest thus far. Staff believes that substantially higher investments, starting at a minimum of $10 million and ranging potentially upwards from $100 million per year, are needed to demonstrate larger-scale technology durability and efficacy to foster confidence such that industry invests private capital to bring these technologies to the marketplace sooner than they would otherwise. Larger public investments also help encourage the acceleration of advanced technologies in new sectors.

Staff Proposal: ARB staff proposes at least one pilot project and 2 demonstration project categories for the fiscal year 2013-14 funding cycle, in addition to carrying out the Zero-Emission Transit demonstration project identified last year. Staff proposes to focus $2 million in demonstration project funds for this year on efforts that can build upon technologies that have proven to be effective in past AQIP demonstration projects. These categories are Tier-4 emission levels in locomotives and further hybridization of marine vessels. Specifically:

- *Locomotives Nearing Tier-4 Emission Levels for NOx and/or PM*:
    - *Genset Switcher Retrofit Pilot*: Retrofitting a group of genset switcher locomotives with diesel particulate filters
    - *Reduce NOx Emissions from Medium Horsepower Locomotives*: Demonstrate reduced NOx emission levels from medium horsepower locomotives
- *Marine Vessel Hybridization*: Expand marine vessel hybridization into additional vessel types.

If additional funds become available for Advanced Technology Demonstration projects beyond the minimum target identified, staff proposes the option of funding additional demonstration projects based on Board priority and available funds. Staff proposes the following demonstration project categories to consider through a public process if additional funds become available:

- Advanced Freight Transport
- Hybrid and Other Advanced Locomotive Technologies
- Advanced Ferries
- Ground Support Equipment
- Advanced Distribution Center Equipment
- Advanced Off-Road Equipment Demonstration

- Advanced Agricultural Equipment
- School Buses

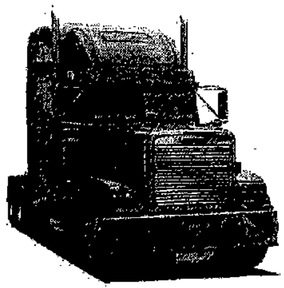
Pursuing all the above proposed projects for inclusion in the Funding Plan is not possible with the current level of AQIP funds. Details on project selection will be vetted through the AQIP Advanced Technology Demonstration Project Work Group. Information on this work group may be found on the Advanced Technology Demonstration Projects webpage at: http://www.arb.ca.gov/msprog/aqip/demo.htm .

Grantee Solicitation

Following Board approval of the proposed Funding Plan and after the State Budget is signed, staff will release solicitations for demonstration projects in order to select a grantee. The solicitations will include all programmatic details potential grantees need to apply for funds, in addition to the criteria upon which the applications will be evaluated and scored.

In accordance with AQIP Guidelines, ARB will begin issuing project solicitation after the Board approves the funding plan. Public work groups will continue to be the primary avenue for seeking input and feedback on solicitations and implementation manuals.

Truck Loan Assistance Program



Minimum Funding Target: $2 million

Synopsis: Assists small business truck owners in obtaining affordable financing for necessary truck upgrades ahead of regulatory compliance schedules.

Project Benefits:

- Supports California's diesel emission reduction goals through early compliance with ARB's diesel vehicle regulations.
- Provides financing opportunities to small business truck owners that are experiencing challenges obtaining financing in California's tight credit market.

Overview: In 2008, the California Legislature directed a one-time appropriation of AQIP funds for use in establishing a loan assistance program to aid small business truck owners affected by ARB's In-Use Truck and Bus Regulation and the Tractor-Trailer Greenhouse Gas Regulation. Formally known as the Providing Loan Assistance for California Equipment Program, about $35 million was allocated to assist truckers. To date, ARB has developed and implemented 2 components of the Providing Loan Assistance for California Equipment Program: a small Pilot Revolving Loan/Lease-to-Own Program, and the Truck Loan Assistance Program.

Launched in April 2009, the successful and ongoing Truck Loan Assistance Program utilizes AQIP funds to aid smaller fleets in obtaining financing for clean truck upgrades ahead of regulatory compliance schedules. This program has been a successful incentive option for leveraging private dollars. Based on the California Pollution Control Financing Authority's California Capital Access Program, the Truck Loan Assistance Program enables lenders to provide affordable financing to small business owners that fall just outside conventional underwriting standards and that may not qualify for traditional financing, particularly in California's tight credit market. In the current program, AQIP funds are set aside in each participating lender's loan loss reserve account for eligible loans (based on a percentage of each enrolled loan amount) to cover potential losses resulting from defaults.

The California Capital Access Program model, a form of loan portfolio insurance, is advantageous for 2 primary reasons. First, by reducing the financial risk to lenders, it creates opportunities for small business truck owners that fall below normal lending criteria and may not qualify for any financing. Second, it provides an inherent benefit of fund leveraging to significantly increase the overall amount of financing available to truck owners. To date, for every $1.00 ARB has spent in the program for loan assistance, participating lenders have provided about $6.50 in financing to a trucker.

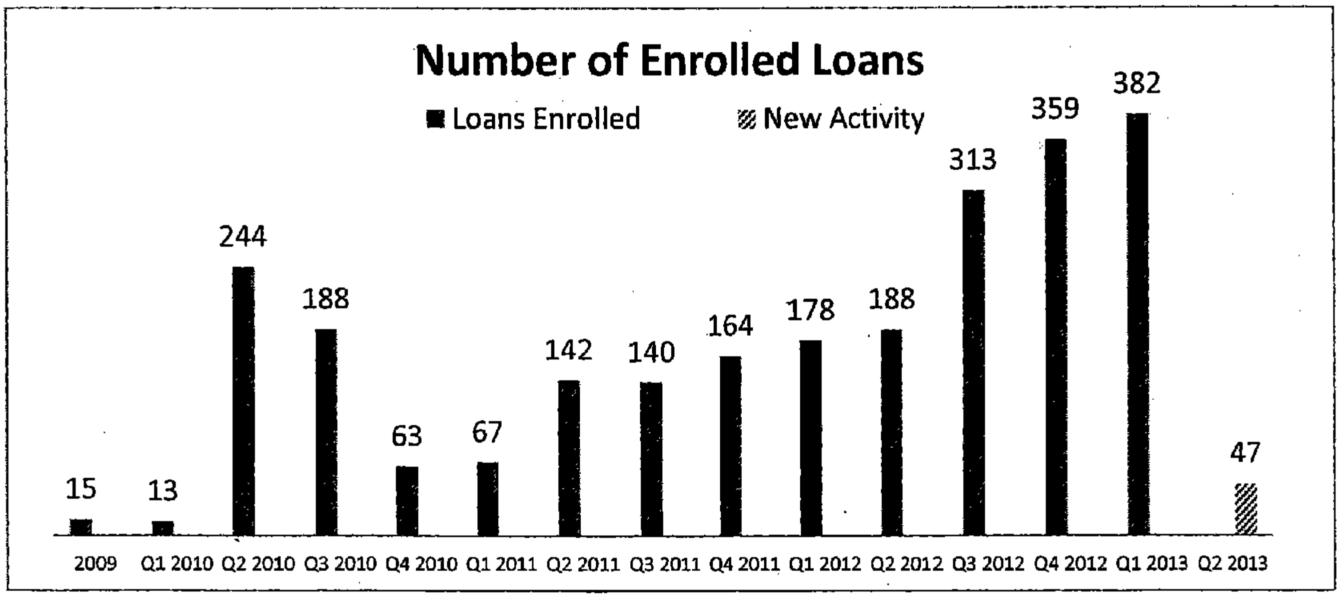
The Truck Loan Assistance Program makes up the largest portion of the Providing Loan Assistance for California Equipment Program, with $34.3 million allocated to date. This program funding includes a recent addition of $4 million as a result of the Board's direction at its March 21, 2013, public meeting to reallocate up to $4 million from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project for fiscal year 2012-13 to the Truck Loan Assistance Program. More information regarding the small Pilot Revolving Loan/Lease-to-Own Program can be found in Appendix A of the fiscal year 2012-13 AQIP Funding Plan.

Status Update: Over the past year, participation in the Truck Loan Assistance Program has grown rapidly as regulatory compliance deadlines near. As of April 9, 2013, approximately $25.6 million in Truck Loan Assistance Program funding has been leveraged to provide about $168 million in financing to small business truckers for the purchase of over 2,900 cleaner trucks, exhaust retrofits, and trailers. Table III-12 below provides the breakdown of loans offered, and Figure III-3 illustrates the program's activity since 2009. To date, over 79 percent of all enrolled loans are issued to owner operators with one truck and 94 percent are issued to fleet owners with 10 or fewer employees.

Table III-12: Truck Loan Assistance Program Status

Vehicles/Equipment Financed as of April 9, 2013					
Program	**Number of Loans Issued**	**Number of Projects Financed**	**Project Type**	**$ Spent**	**Total Amount Financed**
ARB/CPCFA Truck Loan Assistance Program	2,496	2,712	Truck Purchases	$25.6M	$168M
		193	Exhaust Retrofits		
		15	Trailers		

Figure III-3: Truck Loan Assistance Program Activity through April 9, 2013



Funding Status

Although the program began in mid-2009, nearly 60 percent of the total loans issued through the program occurred since the start of 2012, as can be seen in Figure III-3 above. As of the end of January 2013, about $6 million remained in program funding. Based on current activity trends and program conditions, those remaining funds were projected to be depleted in the mid-June timeframe. ARB's current Interagency Agreement with the California Pollution Control Financing Authority to implement the program and fund loan assistance runs through December 2013. At its March 21, 2013, public meeting, the Board approved authority for the Executive Officer to reallocate up to $4 million from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project for fiscal year 2012-13 to the Truck Loan Assistance Program. This additional $4 million in funding (along with a minor program change to slightly decrease ARB's loan loss reserve contribution for each eligible loan) will potentially extend the program through the September timeframe. However, funding will still be depleted before the end of 2013.

Funding Needs: With ongoing regulatory deadlines in the 2014 – 2016 timeframe for ARB's diesel vehicle regulations, ARB staff expects a continued strong demand for program funding to assist the small business trucking sector in financing truck upgrades ahead of compliance schedules. Current activity trends reflect a recent acceleration in program participation and staff expects that to continue throughout the remainder of 2013 and throughout 2014.

Staff estimates an additional $14 million in funding is necessary to extend the program through the 2013-14 fiscal year. Of that, roughly $4 million is needed to extend the program until the end of December and complete the term of ARB's current Interagency Agreement with the California Pollution Control Financing Authority.

Staff Proposal: Staff is proposing to establish a minimum funding target of $2 million, but recognizes that twice that amount is needed to extend the program through the end of the year. Staff is not proposing any modifications to the Truck Loan Assistance Program at this time. If administrative changes are necessary in the future to ensure the program's success, the current interagency agreement between ARB and the California Pollution Control Financing Authority for program implementation includes the flexibility to incorporate modifications.

C. Other AQIP Project Categories

In fiscal years 2009-10 and 2010-11, AQIP supported additional project categories, of which only a few remain active. These remaining active categories include Lawn and Garden Equipment Replacement Projects and the Off-Road Hybrid Equipment Pilot Project. For information on projects that have closed, please see Appendix A from the fiscal year 2012-13 Funding Plan. Although staff is not proposing funding for these projects this year, an update on their status is below.

Lawn and Garden Equipment Replacement Project: AQIP provided a total of $2.6 million in fiscal years 2009-11 to expand local air district lawn mower replacement programs for rebates to consumers who scrap old gasoline powered lawn mowers and replace them with zero-emission models. These district programs have been popular with consumers and successful in reducing emissions. To date, over 12,700 lawn mower replacements have been funded via AQIP. While most district programs have concluded, the Bay Area Air Quality Management District and Yolo Solano Air Quality Management District are in the process of completing their programs. ARB staff has since shifted all new zero-emission lawn mower replacement projects from AQIP to the Carl Moyer Program in part based on the success of AQIP Lawn and Garden Equipment Replacement Project. The Board approved this change in April 2011 as part of the 2011 revisions to the Carl Moyer Guidelines.

Hybrid Off-Road Equipment Pilot Project: The Hybrid Off-Road Equipment Pilot Project is intended to accelerate deployment of commercialized hybrid construction equipment, while evaluating the emissions benefits of the equipment in real world applications. The $2 million in project funds from fiscal year 2012-13 were evenly divided between: 1) vouchers to accelerate hybrid equipment deployment and, 2) duty cycle development and real-world emissions testing. The University of California at Riverside, Center for Environmental Research and Technology (CE-CERT) administered both the deployment and testing elements of the project.

Equipment Deployment

As shown in Table III-13, the Hybrid Off-Road Equipment Pilot Project provided $901,578 to help California fleets purchase ten Caterpillar D7E hybrid dozers and 6 Komatsu HB215-LC-1 hybrid excavators. The dozer's and excavator's respective $73,000 and $28,500 voucher amounts reflect approximately one-half of the hybrid equipment's incremental cost. The deployment element of this project was completed in March 2013.

Table III-13: Vouchers Issued By Equipment Make/Model

Vehicle Type	Vouchers Issued	Total Voucher Funds	Average Voucher Amount	Average Equipment Purchase Price
Caterpillar Hybrid D7E Dozer	10	$730,578	$73,000	$552,943
Komatsu Hybrid HB215-LC-1 Excavator	6	$171,000	$28,500	$288,389
Total	**16**	**$901,578**[1]	--	--

1 - An additional $98,842 was provided to CE-CERT for project administration.

Equipment Testing

CE-CERT, in consultation with ARB staff, is in the process of completing the testing element of the Hybrid Off-Road Equipment Pilot Project.

Activity Characterization, Sequence of Operations/Test Cycle development, and In-Use Emissions Testing were completed on three hybrid Komatsu HB215-LC-1 excavators and three hybrid Caterpillar D7E dozers in participating public and private fleets. Fleet vocations included landfill, rock quarry, and river maintenance vocations (dozer) and general construction and demolition vocations (excavator). Equipment duty cycles for this equipment were developed utilizing a combination of hundreds of hours of time-lapse video, electronic control modules (ECM), and global positioning system (GPS) devices. Project equipment was then tested utilizing portable emissions measurement system (PEMS), comparing the relative emissions per typical duty cycle for the hybrid equipment and its non-hybrid counterpart.

Data analysis and the Final Report are forthcoming. Preliminary emissions testing data suggest a carbon dioxide (CO_2) benefit of 5 to 25 percent for the Caterpillar D7E hybrid dozer and 15 to 30 percent for the Komatsu HB215-LC-1 hybrid excavator relative to their non-hybrid counterparts. However, the data also suggest a 5 to 15 percent NOx increase for the hybrid dozer, while data for the Komatsu excavator was still being evaluated as of April 18, 2013. PM, total hydrocarbon, and carbon monoxide emission data were below detectable levels. This preliminary data indicates that the next generation of hybrid construction equipment will need additional technological advances to ensure it achieves substantial greenhouse gas benefits while also delivering NOx and other criteria pollutant emission benefits. The project methodology and initial results were presented and discussed at an April 23, 2013, public Hybrid Off-Road Equipment Pilot Project Work Group meeting. CE-CERT is expected to complete its emissions testing evaluation and provide a final project report in June 2013.

D. Contingency Plans

The proposed Funding Plan is based upon the latest available information. However, circumstances may change between the time the proposed Funding Plan is released for public comment (such as pending changes in the fiscal year 2013-14 State Budget or lower than anticipated revenues), and when the Board approves the funding plan, project solicitations are issued, project funds awarded, or as projects are implemented. This section describes staff's proposed contingency plans should mid-course corrections be needed to ensure that AQIP funds are spent expeditiously and efficiently. Under these provisions, the Board would grant the Executive Officer authority to make the necessary mid-course adjustments to address the cases described below.

Available AQIP Funds: In recent years, revenues in the Air Quality Improvement Fund have been nearly 30 percent lower than the amount appropriated in the State Budget, so ARB had to scale back its AQIP project funding accordingly. As a result, ARB has awarded about $28 million in funding each year rather than the $40 million annual total included in each of the prior year Board-approved Funding Plans. Additionally, in fiscal year 2012-13, revenues were even less than the "realistic" estimate, which resulted in the delay and ultimate reassignment of a demonstration project into this year's Funding Plan.

Based on this experience, ARB staff is proposing a Funding Plan that establishes minimum allocations for each project category totaling *less* than both the Governor's Proposed Budget allocation of $35 million and the projected available funding for projects. ARB staff forecasts that AQIP fees could generate up to $25 million in project revenue, after accounting for various state administrative costs. Staff is proposing minimum funding targets for each category totaling $20 million, which should leave roughly $5 million unallocated and subject to the contingency provisions outlined below. Establishing minimum targets for each category based on a "realistic" funding scenario reduces the risk of over-obligating funds beyond available revenues, and avoids disproportionally affecting projects that start later in the fiscal year if revenue projections are lowered, as was experienced in fiscal year 2012-13 with the Zero-Emission Transit Demonstration Project.

ARB staff plans to release initial grant solicitations based on the minimum allocations in Table III-1. However, the solicitations and grant agreements will be written with provisions to allow an increase in awarded funding if there are sufficient revenues and project demand. Potential additional funding for each project category would be identified using the following transparent public process:

Once half of the initial minimum funding allocation for a deployment project is spent, staff will:

- project the short term (1-, 3- or 6-month as appropriate) and long term (remaining fiscal year) need for the project;

- evaluate total projected revenue remaining for all AQIP projects;
- propose whether unallocated funds should be allocated to the project; and
- post projections and the funding recommendation for the project being evaluated on the AQIP webpage and hold a conference call or working group meeting to seek public input no less than 10 days prior to allocating money to any project.

This process may be repeated once half of the remaining funds are spent. Additionally, if money remains available after the needs for each of the deployment projects have been met, then remaining funds may be allocated toward demonstration projects.

For example, once $5 million of the $10 million minimum allocation for the Clean Vehicle Rebate Project is spent, staff would evaluate short and long term needs for the project, consider AQIP revenue projections, and make a recommendation for allocating additional funding for the project. If staff were to propose allocating an additional $3 million to the project, then $8 million would be available from that point forward. Once $4 million of the $8 million remaining funding is spent, staff would repeat the evaluation process to determine if more money is available or appropriate to allocate into the project.

With regard to demonstration projects, staff proposes to conduct a mid-year evaluation of revenues and deployment project needs in order to determine if additional demonstration projects should be funded. Similar with the transparent process identified above, staff will evaluate short and long term needs of the deployment projects, consider AQIP revenue projections, and make a recommendation for allocating funding for demonstration projects. Projections and recommendations would be posted on the AQIP webpage, and staff would hold a conference call or working group meeting to seek public input no less than 10 days prior to allocating money to any project.

If funding from other sources is provided for AQIP projects, funds will be allocated as indicated above or as specifically required by the authorizing entity. Additionally, AQIP projects may be altered to accommodate any conditions placed upon the use of alternative sources of funding. ARB staff will consult with project workgroups prior to making any changes to AQIP projects.

Conversely, ARB staff proposes the ability to reallocate funding from any project in the event that demand for a specific project does not materialize. Any changes in funding for a particular project category would be publicly vetted through AQIP project work groups.

Minor Technical/Administrative Changes: The proposed Funding Plan specifies all policy-related details regarding the projects to be funded. However, technical or administrative changes in implementation procedures may be needed from time to time to ensure these projects are successful. Staff proposes a transparent process in which minor changes to a project category would be publicly vetted through the AQIP project work groups that have been established to discuss the implementation details of each project. These changes would be within the Funding Plan parameters approved by the Board.

E. Fiscal Year 2013-14 Project Solicitations

Following Board approval of the proposed Funding Plan and after the final State Budget is signed; staff will release solicitations for each of the project categories in order to select a grantee to implement the projects in fiscal year 2013-14. The solicitations will include all the programmatic details potential grantees need to apply for funds, in addition to the criteria upon which the applications will be evaluated and scored.

In accordance with AQIP Guidelines, ARB will begin issuing project solicitations after the Board approves the funding plan. The public work groups established for each project category will continue to be the primary avenue for seeking input and feedback on solicitations and implementation manuals. Staff will monitor and evaluate AQIP projects over the course of the fiscal year and share project data with the work groups.

IV. References

In developing the proposed Funding Plan, ARB staff relied on information from previous Board approved AQIP Funding Plans, AQIP Guidelines, and the CEC's Assembly Bill 118 Investment Plans . Links to this reference material are listed below:

Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed AB 118 Air Quality Guidelines for the Air Quality Improvement Program and the Alternative and Renewable Fuel and Vehicle Technology Program, Released August 8, 2008. http://www.arb.ca.gov/regact/2008/aqipfuels08/aqipfuels08.htm

Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed AB 118 Air Quality Improvement Guidelines, Released March 6, 2009. http://www.arb.ca.gov/regact/2009/aqip09/aqip09.htm

Air Resources Board. Proposed AB 118 Air Quality Improvement Program Funding Plan For Fiscal Year 2009-10. Approved April 24, 2009. http://www.arb.ca.gov/msprog/aqip/fundplan/aqip_FY09-10_approved.pdf http://www.arb.ca.gov/msprog/aqip/fundplan/aqip_FY09-10_FP_appendix.pdf

Air Resources Board. Proposed AB 118 Air Quality Improvement Program Funding Plan For Fiscal Year 2010-11. Approved June 24, 2010. http://www.arb.ca.gov/msprog/aqip/fundplan/AQIP_FP_JUNE%202010-FINAL.pdf

Air Resources Board. Proposed AB 118 Air Quality Improvement Program Funding Plan For Fiscal Year 2011-12. Approved July 21, 2011. http://www.arb.ca.gov/msprog/aqip/fundplan/final_approved_aqip_fy2011_funding_plan.pdf

Air Resources Board. Proposed AB 118 Air Quality Improvement Program Funding Plan For Fiscal Year 2012-13. Approved June 27, 2012. http://www.arb.ca.gov/msprog/aqip/fundplan/AQIP_FY2012_Funding_Plan-Approved.pdf

Air Resources Board. 2011 Biennial Report to the Legislature on AB 118 Air Quality Improvement Program. January 11, 2011. http://www.arb.ca.gov/msprog/aqip/leg_reports.htm

California Energy Commission, 2007. State Alternative Fuels Plan. Publication Number: CEC-600-2007-011-CMF. http://www.energy.ca.gov/2007publications/CEC-600-2007-011/CEC-600-2007-011-CMF.PDF

California Energy Commission, 2011. 2011 Integrated Energy Policy Report. Publication Number: CEC-100-2011-001-CMF http://www.energy.ca.gov/2011publications/CEC-100-2011-001/CEC-100-2011-001-CMF.pdf

McKinney, Jim, Charles Smith, Andre Freeman, Pilar Magaña, Darcie Chapman. 2011. Benefits Report for the Alternative and Renewable Fuel and Vehicle Technology Program, Staff Draft Report. California Energy Commission, Fuels and Transportation Division. Publication number: CEC-600-2011-008-SD http://www.energy.ca.gov/2011publications/CEC-600-2011-008/CEC-600-2011-008-SD.pdf

Smith, Charles, Jim McKinney. 2012. 2012-2013 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program Lead Commissioner Report. California Energy Commission, Fuels and Transportation Division. Publication Number: CEC-600-2012-001-LCR http://www.energy.ca.gov/2012publications/CEC-600-2012-001/CEC-600-2012-001-LCF.pdf

Smith, Charles, Jim McKinney. 2013. 2013-2014 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program Lead Commissioner Report. California Energy Commission, Fuels and Transportation Division. Publication Number: CEC-600-2012-008-CMF http://www.energy.ca.gov/2012publications/CEC-600-2012-008/CEC-600-2012-008-CMF.pdf

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER ADOPTION OF PROPOSITION 1B PROGRAM FUNDING AWARDS FROM FISCAL YEAR 2013-14 (YEAR 4) FUNDS TO REDUCE EMISSIONS FROM GOODS MOVEMENT AND UPDATES TO THE PROGRAM GUIDELINES FOR IMPLEMENTATION

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider adoption of Proposition 1B: Goods Movement Emission Reduction Program (Program) funding awards from Fiscal Year (FY) 2013-14 (Year 4) funds and updates to the Program Guidelines for Implementation (Guidelines).

DATE: July 25, 2013

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., July 25, 2013. Please consult the agenda for the meeting, which will be available at least 10 days before July 25, 2013, to determine the schedule on which this item will be considered.

BACKGROUND

The movement of freight (goods movement) throughout California results in emissions of diesel particulate matter (diesel PM), oxides of nitrogen (NOx), and other pollutants. Freight movement involves the use of a variety of mobile emission sources, such as heavy duty trucks, diesel locomotives, ocean-going cargo ships, harbor craft, and cargo handling equipment. ARB has identified diesel PM as a toxic air contaminant, and NOx contributes to regional ozone and PM levels that exceed State and federal air quality standards. The emissions from these mobile sources result in significant human health risks and adverse environmental effects, particularly when such sources release emissions near already heavily-impacted communities located in California's trade corridors where these sources operate.

Proposition 1B, approved by voters in 2006, authorizes $1 billion in bond funding to ARB to quickly reduce air pollution emissions and health risk from freight movement along California's four priority trade corridors.

The Program is a partnership between ARB and local agencies (e.g., air districts and ports). ARB develops the Guidelines and awards Program funding to local agencies; those agencies then use a competitive process to provide incentives to equipment owners to upgrade to cleaner technology. On January 25, 2013, the Board approved updated Guidelines, including the previously-adopted funding targets for each trade corridor.

Out of the $1 billion authorized for the Program, $980 million is allocated for Program project implementation while the remaining $20 million is allocated to cover bond issuance and oversight costs incurred by the control agencies. All funding is contingent on bond sales by the State and appropriation by the Legislature. To date, ARB has received and awarded approximately $587 million to implement various projects. Currently, the Legislature has appropriated $154 million of the remaining $393 million balance.

On February 7, 2013, ARB released a Notice of Funding Availability (for the FY2013-14 (Year 4) funding allocation) to solicit applications from local agencies to administer emission reduction projects. Six qualified local agencies and one State agency submitted 15 project proposals, requesting over $518.7 million. For a summary of the applications received, please see the Program website at: http://www.arb.ca.gov/gmbond.

STAFF PROPOSAL

ARB will hold a public meeting on July 25, 2013, to award up to the $154 million current appropriation, contingent on funding availability. Staff is recommending up to $4 million for ARB administrative costs associated with the Program, and up to $150 million for eligible projects (as defined by the Guidelines), within each of California's four priority trade corridors. Staff's recommendations are shown in the table below, and are based on:

- Achieving the cumulative corridor funding targets for each region;
- Implementing the Board's top funding priority for trucks; and
- Responding to local agency requests for funding and their priorities within each trade corridor.

Of the project funding available, staff is recommending $138.4 million for grants to local air districts to implement truck and harborcraft upgrades, and up to $11.6 million for two additional programs to support the transition to cleaner trucks. Table 1 shows the proposed funding allocations by trade corridor and project type, as well as the additional multi-corridor truck programs.

Table 1: Recommendations for Allocating FY2013-14 (Year 4) Funds

Trade Corridor	Funding Category	Funds (millions)	
Los Angeles/Inland Empire	Trucks	$ 78.5	
	Corridor Total		$ 78.5
Central Valley	Trucks	$ 36.9	
	Corridor Total		$ 36.9
Bay Area	Trucks	$ 9.9	
	Corridor Total		$ 9.9
San Diego/Border Region	Trucks	$ 12.3	
	Harbor Craft	$ 0.8	
	Corridor Total		$ 13.1
SUBTOTAL			$138.4
Multi-Corridor Truck Programs			
Loan Assistance (All)	Trucks	$ 5.3	
	Total		$ 5.3
Filter Substrate Replacements (All)	Trucks	$ 6.3	
	Total		$ 6.3
SUBTOTAL			$ 11.6
ARB Administrative Costs*	Administrative Costs	$ 4.0	
	Total		$ 4.0
TOTAL			$154.0

* Limited to actual costs. Remaining funds will be used to supplement other projects.

Truck Loan Assistance. The first proposal for multi-corridor truck funding is up to $5.3 million to ARB to support improved access to financing for truck owners receiving Proposition 1B grants. ARB would make the funds available through the California Capital Access Program, which is run by the California Pollution Control Financing Authority. This existing program encourages banks and other financial institutions to make loans to small businesses that have difficulty obtaining financing.

Filter Substrate Replacement. The second proposal for multi-corridor truck funding is a new concept to address a unique situation with roughly 1,600 trucks that meet the Proposition 1B-eligibility criteria regarding hauling of goods primarily within the four trade corridors. Owners of these trucks previously invested private funds, or a combination of private and public funds, to install a specific model of verified diesel particulate filter that used a metal substrate to achieve the diesel particulate control.

In response to safety concerns with just this model, ARB rescinded the verification and the manufacturer initiated a voluntary recall. The filter manufacturer has since gone out of business. In many cases, the filter core or substrate was removed from the housing on each truck (or other equipment). Today, these trucks have the filter housing, but without the desired diesel particulate matter control. Because the truck owners installed verified filters in good faith, ARB is allowing vehicles that are impacted by the recall to remain in compliance with the in-use fleet rules, with appropriate documentation.

Staff is recommending that the Board approve a targeted revision to the Guidelines to establish an eligible project in the truck category to fully fund the installation of a new ceramic substrate within the filter housing on this limited population of trucks. All of the particulate matter benefits are "extra" relative to the current situation. In addition, staff is proposing that the Board allocate up to $6.3 million to fund the substrate replacement in these recalled diesel particulate filters on Proposition 1B-eligible trucks. If the Board adopts the Guideline revision and the funding allocation, ARB staff would evaluate the physical locations of the affected trucks and determine which air district(s) might be best positioned to manage this specialized replacement program. ARB would offer the opportunity to administer the resulting grant program to that district or districts.

If the funds recommended for the loan assistance or the filter substrate replacement programs are not fully utilized, staff recommends that the Board direct the Executive Officer to reallocate those funds according to the protocols established in the Guidelines.

Administrative Changes. In addition to awarding FY2013-14 (Year 4) funds, ARB staff will be seeking Board input on changes to the Guidelines that are under development to respond to new fiscal direction. In general, State agencies that receive bond funds have been striving to increase the efficiency of these programs by limiting the amount of time in which bond funds remain unused. ARB and the local agencies have already taken steps to reduce the time between when bond funds are received by ARB, and when they are distributed to the local agencies participating in the Program. However, additional streamlining of the grant process is desired to further decrease the time between when the local agencies receive funds and when projects are completed. ARB staff will outline these general changes to the grant process at this Board meeting, and propose that the Executive Officer approve the changes to the Guidelines once ARB has completed the coordination work with the Department of Finance and local agencies.

AVAILABILITY OF DOCUMENTS

ARB is conducting a series of public workshops July 11-15, 2013, to receive public input on the recommendations shown above. More information on these workshops is available on the Program website at: www.arb.ca.gov/gmbond.

ARB staff will release a formal Staff Report with a more detailed discussion of the award recommendations. Paper copies of the Staff Report may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, before the July 25, 2013 Board meeting. The Staff Report may also be obtained from the Program website at: www.arb.ca.gov/gmbond.

The complete applications submitted by the local and State agencies for FY2013-14 (Year 4) funding and tables summarizing those applications are available on the Program website at: www.arb.ca.gov/gmbond, along with the Guidelines and other relevant documents.

SUBMITTAL OF PUBLIC COMMENTS AND AGENCY CONTACTS

Interested members of the public may present comments orally or in writing at the meeting, and may be submitted by postal mail or by electronic submittal before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, July 24, 2013**, and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

Further inquiries regarding this matter should be directed to Ms. Melissa Niederreiter, Air Pollution Specialist at (916) 323-6576, or Ms. Elizabeth Yura, Manager, Goods Movement Program Section at (916) 327-2953.

SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 7 business days before the scheduled Board meeting. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia
- Documentos disponibles en un formato alterno u otro idioma
- Una acomodación razonable relacionados con una incapacidad

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 7 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: July 15, 2013

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at: www.arb.ca.gov.