

California Environmental Protection Agency

 **Air Resources Board**

STAFF REPORT
INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

PUBLIC HEARING TO CONSIDER ADOPTION OF REGULATION FOR THE
CERTIFICATION, PERFORMANCE STANDARDS, AND TEST PROCEDURES FOR
PORTABLE OUTBOARD MARINE TANKS AND COMPONENTS

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STANDARDS, AND TEST PROCEDURES FOR PORTABLE OUTBOARD MARINE
TANKS AND COMPONENTS

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I EXECUTIVE SUMMARY

The Air Resources Board (ARB) staff is proposing a regulation to control Reactive Organic Gases (ROG) from portable outboard marine tanks and components (OMT). This proposed regulation has been developed using the principle of technology transfer. It requires permeation and evaporative technologies that are currently available, cost effective, and have already been applied to reduce various sources of gasoline vapor emissions including portable fuel containers (PFC) and small off-road engines and equipment (SORE).

OMTs are gasoline tanks with a capacity of 30 gallons or less and the accompanying fuel hoses, primer bulbs and tank caps used on various size boats. For small and medium size boats the gasoline tanks and engines are portable to facilitate transportation, maintenance and storage. Portable outboard engines do not have a fuel pump so the primer bulb is used to prime (transfer gasoline from the tank to the engine through the fuel hose) the engine to ensure it will start. After the engine is running the operating cycle continues the flow of gasoline.

Staff estimates the combined annual average fuel losses from diurnal emissions, leaks from tanks, and permeation emissions from hoses and primer bulbs amount to about 4.6 gallons of gasoline per tank. At a cost of \$3.50 per gallon of gasoline the fuel lost costs consumers over \$16 per tank per year. Statewide, over the 18 years estimated for the entire population of OMTs to be replaced (often called the lifetime of the regulation) this amounts to about \$32 million. The proposed regulation would reduce 2020 emissions by 4.2 tons per day (tpd) of ROG from the expected 200,000 OMTs in California and result in an overall reduction of approximately 90 million pounds of ROG. This would result in a cost savings of about \$0.30 per pound of ROG reduced.

The proposed performance standards are the same as those being considered by EPA for their OMT rule and are similar to ARB requirements for PFC and SORE equipment. This similarity in proposed performance standards will achieve consistency between the different source categories (PFC and SORE) within the State and between State and federal requirements if the federal requirements are adopted. Staff worked with representatives of tank and fuel hose manufacturers to develop the proposed performance standards. ARB staff proposes emissions from tanks be limited to 2.5 grams per meter squared per day ($\text{g}/\text{m}^2/\text{day}$), emissions from fuel hoses and primer bulbs be limited to 15 $\text{g}/\text{m}^2/\text{day}$, and caps to be self sealing.

Staff is proposing that all new OMT tanks and components be subject to the proposed performance standards starting in January 2010 for hoses and caps and starting in January 2011 for tanks and primer bulbs.

The Staff proposed regulation includes a new certification procedure, CP-510, *Certification Procedure for Portable Outboard Marine Tanks and Components* which establishes:

- Diurnal loss control performance standards for portable outboard marine tanks;
- Permeation loss control performance standards for portable outboard marine tank fuel hoses and primer bulbs; and
- Performance standard for portable outboard marine tank caps to be considered self sealing.

The proposed certification for OMTs relies on the adoption of two new test procedures to evaluate conformance with the proposed performance standards:

- TP-511, *Diurnal Rate from Portable Outboard Marine Tanks*; and
- TP-512, *Permeation Rate from Portable Outboard Marine Tank Fuel Hoses and Portable Outboard Marine Tank Primer Bulbs*.

These new test procedures will ensure the OMTs meet the proposed performance standards required by the proposed regulation.

ARB staff conducted four public workshops for stakeholders to address technical and policy issues. These workshops were held between January 2007, and April 2008. In working with the various stakeholders ARB staff believes that all issues raised during the public workshop process have been resolved.

ARB staff evaluates climate change considerations. ROG can absorb infrared radiation, and the more complex a ROG, the greater its ability to absorb infrared radiation and contribute to global warming. Unlike oxides of nitrogen, ROGs generally do not initiate climate responses of the opposite sign (i.e., they are generally net warmers). However, ROGs have the added complication that there are many different types with different behavior in the atmosphere, making quantifying their warming impact difficult. ROGs influence climate through indirect effects via their production of organic aerosols and their involvement in photochemistry (i.e., production of ozone, and in prolonging the life of methane in the atmosphere, although the effect varies depending on local air quality). Typically, the indirect effect is the dominant path by which ROG contribute to global warming. Overall, strategies for reducing ROG emissions are beneficial from a climate change perspective. The Intergovernmental Panel on Climate Change has provided global warming potentials for a relative small set of ROG species, so it is not possible to quantify this benefit.

II INTRODUCTION AND BACKGROUND

A) Introduction

This section of the staff report summarizes the legal authority, gasoline vapor control strategy, provides an overview of OMTs, includes a discussion of the OMT proposed regulation, and describes the public participation process.

B) Legal Authority

1) State Law

In 1988, the California legislature enacted the California Clean Air Act (CCAA), which declared that attainment of State Ambient Air Quality Standards is necessary to promote and protect public health, particularly the health of children, older people, and those with respiratory diseases. The legislature also directed that these State Ambient Air Quality Standards be attained by the earliest practicable date.

California law, including the California Clean Air Act as codified in the Health and Safety Code (HSC) Sections 43013 and 43018, grants the ARB authority to regulate off-road mobile sources of emissions and fuels. Such sources include outboard engines, personal watercraft, all-terrain vehicles, off-road motorcycles and small off-road engines and equipment. Outboard engines use OMTs to supply fuel for operation. ARB is therefore authorized to regulate OMT emissions both as an off-road mobile source and as an emission source associated with motor vehicle fuel.

2) Federal Requirements

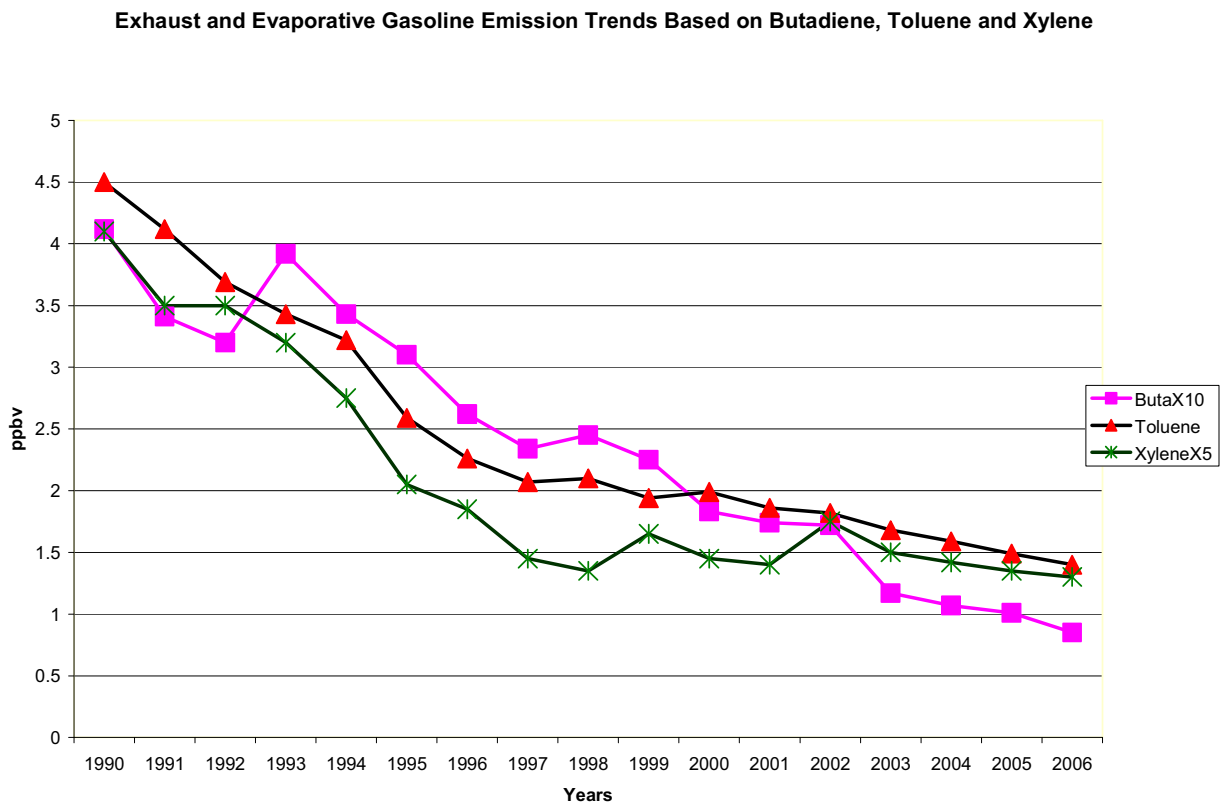
The US Environmental Protection Agency (EPA) is in the process of promulgating requirements to control emissions from Marine Spark Ignited and Small Spark Ignited Engines, Vessels, and Equipment. The EPA plans to adopt the requirements this summer. The requirements planned by EPA are expected to be the same with similar implementation dates to the ARB staff proposed OMT regulation. A separate California regulation is needed in case federal rule promulgation is delayed and to ensure California can implement its more robust enforcement program for this emission source category.

C) Gasoline Vapor Control Strategy

The ARB has been actively engaged in the control of evaporative gasoline emissions since 1975 when the Board adopted the first certification and test procedures for vapor recovery systems installed on gasoline dispensing facilities (GDF). Since then the Board has adopted requirements controlling evaporative gasoline emissions for other emission categories such as PFCs, SORE, enhanced vapor recovery (EVR), and above ground storage tanks (AST).

The Board has also been aggressively controlling exhaust emissions from internal combustion engines since its formation in 1968. Using 1,3-butadiene, toluene, and xylene trends in the ambient air as indicators of the success of the program, it is shown (Figure II-1) that recent air concentrations of 1,3-butadiene have fallen to about 20 percent of the 1990 levels. As expected, toluene and xylene, also indicators of auto exhaust emissions have also been reduced. It is generally agreed that 1,3-butadiene is solely the result of the combustion process, whereas toluene and xylene are found in both exhaust and in gasoline vapors. An examination of the Figure shows that concentrations of 1,3-butadiene, have continued to drop after 2002, but the decline in toluene concentrations has slowed. Also, the Figure shows that the concentrations of xylene have been flat since 1998. This strongly suggests that evaporative gasoline emissions are not being controlled as effectively as corresponding exhaust emissions.

Figure II-1 Exhaust and Evaporative Gasoline Emission Trends Based on Ambient Concentration Data



Starting in 1999, the ARB adopted several regulations to further reduce emissions from evaporative sources. These regulations include PFC, EVR, SORE, and AST. These categories are shown as Completed Regulations in Table II-1. To continue to reduce evaporative emissions, ARB staff is looking to

identify additional emission source categories and transfer control technology where applicable. These are shown as Prospective Regulations in Table II-1. The ARB staff is currently working to develop emission inventories and regulations for these sources. These source categories will be presented to the Board for consideration in coming years.

Table II–1 Completed and Prospective ARB Gasoline Vapor Control Regulations – Off-road Engines and Fuel Containers/Dispensers

Completed and Prospective Regulations				
Name of Regulation	Adoption Yr	Implementation Yr	Uncontrolled Emissions (tpd)	Emission Reductions (tpd)
Completed Regulations				
Portable Fuel Container (PFC) Original Reg	1999	2001	101	70
Enhanced Vapor Recovery (EVR) USTs	2000	2005-2009	53	25
Small Off Road Engines (SORE)	2003	2006	58	32
PFC Amendments	2005	2007	32	18
EVR for ASTs	2006	2008	4	1–2
Subtotal				146
Prospective Regulations				
Portable Outboard Marine Tanks and Components (OMT)	2008	2011	5.6	4.2
GDF Hose Permeation	2008	2009–2013	2	1.5
Pleasure Craft (Spark Ignited Personal Watercraft and Marine Vessels)	2009	2011	42	37
Off-Highway Recreational Vehicles (Off-Road Motorcycles./ATV)	2009	2012	13	9
RV Fueling Stations	2009	2012	tbd*	tbd*
Portable Fueling Stations	2009	2012	tbd*	tbd*
Mobile Fuelers	2010	2013	tbd*	tbd*
Truck/Trailer Auxiliary Fuel Tanks	2011	2013	tbd*	tbd*
Subtotal				52
Total				198

* tbd = to be determined

D) OMT Overview

OMTs are made of either high-density polyethylene (HDPE or plastic) or metal and are sold in a variety of shapes and sizes typically less than 30 gallons capacity. OMTs are used to store and supply fuel to outboard marine engines including small fishing boats, houseboats, and inflatable watercraft. Figure II-2 shows a typical portable outboard marine tank, fuel hose and primer bulb.

Figure II – 2 Portable Outboard Marine Tank, Fuel Hose and Primer Bulb



Gasoline vapor emissions from OMTs result from permeation through plastic or rubber materials or in the form of evaporation through openings and connections. Even though the emissions from a single OMT are small, over 200,000 OMTs are estimated to be in use in California in 2010 and are calculated to emit approximately 4.6 tpd of ROG. In 2020 with about five percent fewer OMTs, due to changes in market conditions, the uncontrolled emissions are expected to be approximately 5.6 tpd of ROG. This increase is due largely to the greater number of higher emitting plastic tanks compared to metal tanks.

E) Applicability of Proposed Regulation

The proposed regulation will require all new OMT tanks and components sold in California to certify to proposed performance standards that will be similar across emission categories within the State (Appendix A). Under the proposal, ARB will issue an executive order, pursuant to Certification Procedure CP-510 (Appendix B) certifying portable outboard marine tanks, portable outboard marine tank fuel hoses, portable outboard marine tank primer bulbs, and portable outboard marine tank self sealing caps as meeting the proposed performance standards according to Test Procedures TP-511 (Appendix C) and TP-512 (Appendix D). These certifications become mandatory beginning in 2010 for fuel hoses and self sealing caps and in 2011 for tanks and primer bulbs. The proposed regulation would allow manufacturers to use the EPA proposed steady state test procedure as proof that their tanks meet the proposed performance standards and could therefore be certified for sale in California without additional testing. Additionally, the proposed regulation allows manufacturers to provide testing data verifying compliance with the performance standards for other ARB programs, such as SORE, in order to receive certification for their OMT products.

F) Public Process

ARB staff has conducted four public workshops for stakeholders to address technical and policy issues and define regulatory development timelines since January 2007. The dates and locations of workshops are listed in Table II-2.

Table II–2 Workshop Meetings

DATE	LOCATION
January 24, 2007	Sacramento
April 24, 2007	Sacramento
January 30, 2008	Sacramento
April 10, 2008	Sacramento

Staff established the OMT web site (<http://www.arb.ca.gov/consprod/fuel-containers/omt/omt.htm>) providing stakeholders with information regarding the OMT program as well as updates of the proposed regulation. All persons on the e-mail list serve are notified whenever new information is posted on the OMT web site. Workshop presentations and associated documents are posted on the web site prior to the workshop date. Interested stakeholders participated in the workshops in person or via conference call.

III NEED FOR OMT RULEMAKING

A) Introduction

This section of the staff report discusses the reasons and justification for the proposed regulation, including the State Implementation Plan, consistency with other State and EPA requirements, and climate change issues.

B) State Implementation Plan

All areas that are designated non-attainment for the National Ambient Air Quality Standards are required by the federal Clean Air Act to submit a State Implementation Plan (SIP) containing strategies to improve air quality and achieve the National Ambient Air Quality Standards. In 2007, ARB adopted the California comprehensive SIP for ozone. The 2007 SIP includes State measures to control exhaust and evaporative emissions from off-road mobile sources. Reductions in exhaust and evaporative emissions from recreational boats and off-road recreational vehicles are prominent in the 2007 SIP strategy for off-road sources. The 2007 SIP State strategy proposes to set standards where there are none and make standards more stringent where controls are not adequately stringent. Off-road sources used mainly for recreational purposes during the summer ozone season are large emission contributors targeted in the 2007 SIP. In particular, the 2007 SIP proposes to set evaporative standards for many gasoline-fueled off-road sources. The 2007 SIP strategy identifies portable fuel tanks used on outboard recreational boats, refueling tanks mounted on pickups and large recreational vehicles, and fueling hoses as targets for establishing evaporative standards and evaporative emission reductions.

C) Consistency with PFC, SORE and EPA Requirements

The current diurnal and permeation requirements for tanks and fuel hoses included in the PFC and SORE rules are not applicable to OMTs even though the

use of the components is similar. The manufacturers of tanks and fuel hoses for PFC and SORE tanks and fuel hoses are the same manufacturers of OMT tanks and components. To obtain additional emission reductions, staff is proposing to apply similar diurnal and permeation requirements from the PFC, SORE and EPA rules to OMTs.

D) Climate Change Considerations

ROGs can absorb infrared radiation, and the more complex a ROG, the greater its ability to absorb infrared radiation and contribute to global warming (Collins, 2002). Unlike oxides of nitrogen, ROGs generally do not initiate climate responses of the opposite sign (i.e., they are generally net warmers). However, ROGs have the added complication that there are many different types with different behavior in the atmosphere, making quantifying their warming impact difficult. ROGs influence climate through indirect effects via their production of organic aerosols and their involvement in photochemistry (i.e., production of ozone, and in prolonging the life of methane in the atmosphere, although the effect varies depending on local air quality). Typically, the indirect effect is the dominant path by which ROG contribute to global warming. Overall, strategies for reducing ROG emissions are beneficial from a climate change perspective. The Intergovernmental Panel on Climate Change (2007) has provided global warming potentials for a relative small set of ROG species, so it is not possible to quantify this benefit.

IV SUMMARY OF PROPOSAL

A) Introduction

This section of the staff report discusses the development of the emission inventory for OMTs which constitutes the basis for the proposed performance standards, the standards as proposed, the availability of technology to meet proposed performance standards, and new certification and test procedures.

The central element of the proposed regulation is to transfer similar performance standards that are currently used in California for two categories (PFC and SORE) to a new source category to reduce emissions due to permeation and evaporation.

B) Emission Inventory

ARB staff sponsored a Statewide phone survey conducted by California State University, Sacramento to obtain information from consumers concerning their experiences using OMTs, as well as to obtain information relating to the number of OMTs used in California. The survey results were delivered to staff in March 2007 and provided valuable insight about the OMT population (Appendix E). Based on the survey parameters, a conservative estimate of the Statewide

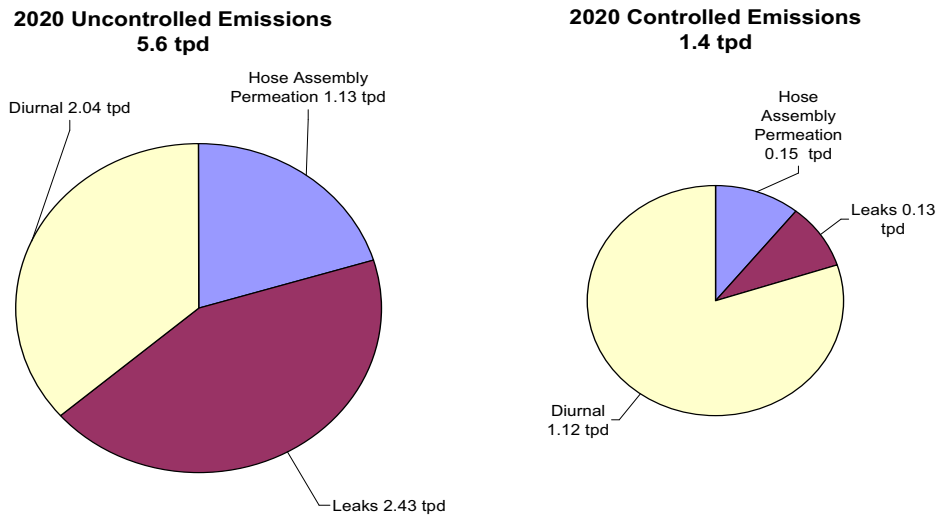
population is 200,000 OMTs. Also, survey parameters suggest there may be as many as an additional 100,000 OMTs Statewide.

Staff conducted testing on OMTs and components and determined the emission rates for the components. The term “diurnal emissions” refers to the total permeation and evaporative emission losses that result from subjecting a container filled with gasoline to a required daily rise and fall in summer temperature, simulated under laboratory conditions. Diurnal emissions may be the result of permeation through plastic and rubber materials and evaporation through fittings and openings. Diurnal emissions from tanks ranged from over 2 grams per day (g/d) to more than 6 g/d depending on the fuel used. This is roughly equivalent to a range of over 85 grams per square meter per day ($\text{g}/\text{m}^2/\text{d}$) to nearly 390 $\text{g}/\text{m}^2/\text{d}$ where m^2 refers to the interior surface area of the part being tested. Appendix F summarizes the test results. The testing showed that diurnal emissions are significant and provide the basis for the emissions inventory and the proposed regulation to control diurnal emissions.

Hose and primer bulb permeation emission losses refers to the emission losses that result from fuel hoses and primer bulbs full of gasoline and subject to a steady state temperature. To evaluate the extent of permeation emission losses from this category, staff subjected samples of available existing fuel hoses and primer bulbs to a steady state temperature in the laboratory. These testing results are also summarized in Appendix F. Permeation losses averaged nearly 8 g/d which is roughly equivalent to 120 $\text{g}/\text{m}^2/\text{d}$. The testing showed that like diurnal emissions, permeation emission losses are a significant contributor to ROG emissions, and provides further information for the development of the emission inventory and the basis for the proposed regulation to control permeation emissions.

Using the current inventory of OMT tanks and components and applying the emission rates developed through testing, staff estimates the uncontrolled ROG emissions for 2010 are approximately 4.6 tpd and if left uncontrolled 2020 emissions would be 5.6 tpd instead of the controlled 1.4 tpd for a typical summer day. Figure IV-1 compares the 2020 uncontrolled emissions to the 2020 controlled emissions.

Figure IV – 1 Uncontrolled Emissions vs. Controlled Emissions in 2020



C) Proposed Performance Standards

1) Diurnal Performance Standards

Proposed performance standards to control diurnal emissions for new OMTs begin January 1, 2010. The proposed regulation requires the manufacturers of gasoline tanks used for portable outboard marine engines to manufacture OMT tanks using similar technologies now required in other source categories such as PFCs and SORE. The proposed performance standards require the following for OMTs:

- (i) By January 1, 2010, the use of a self-sealing cap that will automatically seal up to a minimum of 5 psig; and,
- (ii) By January 1, 2011, diurnal emissions not to exceed 1.5 g/m²/d.

2) Permeation Performance Standards

Proposed performance standards to control permeation emissions for new OMT fuel hoses and primer bulbs begin January 1, 2010. The proposed regulation requires the manufacturers of fuel hoses used for portable outboard marine engines to manufacture OMT fuel hoses using similar technologies now required in other source categories such as PFCs and SORE. Primer bulbs, used to start the fuel flowing from the tank to the engine will be required to meet the same proposed permeation performance standards as fuel hoses. The proposed performance standards require the following:

- (i) By January 1, 2010, permeation emissions from fuel hoses not to exceed 15 g/m²/d; and,

- (ii) By January 1, 2011, permeation emissions from primer bulbs not to exceed 15 g/m²/d.

D) Availability of Technology

The proposed regulation has been developed using the principle of technology transfer. The proposed performance standards rely on technologies that are currently required in two programs, PFCs and SORE, in California. It is reasonable to expect manufacturers of OMT tanks, hoses, and primer bulbs to use existing technology to comply with the proposed performance standards.

E) New Certification and Test Procedures

1) CP- 510, Certification Procedure for Portable Outboard Marine Tanks and Components

The certification procedure, CP-510 (Appendix B) establishes the criteria and procedures used by ARB to evaluate and certify portable outboard marine tanks, portable outboard marine tank self sealing caps, portable outboard marine tank fuel hoses, and portable outboard marine tank primer bulbs manufactured for sale, advertised for sale, sold, or offered for sale in California or that are introduced, delivered or imported into California for introduction into commerce. An Executive Order will only be issued for a portable outboard marine tank, portable outboard marine tank self sealing cap, portable outboard marine tank fuel hose, or portable outboard marine tank primer bulb that demonstrates compliance with all applicable certification requirements.

2) TP-511, Diurnal Rate from Portable Outboard Marine Tanks

This test procedure (Appendix C) is used by the ARB to determine the diurnal emission rate from portable outboard marine tanks as required in Certification Procedure CP-510. This test procedure is applicable in all cases where portable outboard marine tanks are subject to the maximum allowable diurnal emissions rate for portable outboard marine tanks that are manufactured for sale, advertised for sale, sold, or offered for sale in California or that are introduced, delivered or imported into California for introduction into commerce.

3) TP-512, Permeation Rate from Portable Outboard Marine Tank Fuel Hoses and Portable Outboard Marine Tank Primer Bulbs

This test procedure (Appendix D) is used by the ARB to determine the permeation rate from portable outboard marine tank fuel hoses and portable outboard marine tank primer bulbs as required in Certification Procedure CP-510. This test procedure is applicable in all cases where portable outboard marine tank fuel hoses and portable outboard marine tank primer bulbs are subject to the maximum allowable permeation rates for portable outboard marine tank fuel hoses and portable outboard marine tank primer bulbs that

are manufactured for sale, advertised for sale, sold, or offered for sale in California or that are introduced, delivered or imported into California for introduction into commerce.

V ENVIRONMENTAL AND ECONOMIC IMPACT

A) Introduction

This section of the staff report discusses the environmental and economic impacts of the proposed regulation. The environmental impact includes the OMT population, baseline emissions and emission reductions. Economic impacts consider cost savings from preventing fuel losses due to the diurnal emission losses from tanks and permeation losses from hoses and bulbs, staff assumptions related to the costs of complying with the proposed performance standards, and cost effectiveness. The section also includes a discussion of the fiscal impacts to the State, and a discussion of environmental justice issues.

B) Environmental Impact

1) OMT Population

ARB staff sponsored a Statewide phone survey conducted by California State University, Sacramento (CSUS) to obtain information from consumers concerning their experiences using OMTs, as well as to obtain information relating to the number of OMTs used in California. The survey results were provided to staff in March 2007 and made available to stakeholders. Based on the survey parameters, a conservative estimate of the Statewide population is 200,000 OMTs.

2) Baseline Emissions

The baseline OMT emissions were developed from the 2007 CSUS survey, Department of Motor Vehicle (DMV) registration data, test data, and data from manufacturers. Staff estimates there are about 4.6 tpd of ROG emissions from OMTs in California in 2010. Table V-1 summarizes the 2010 Statewide emissions from OMTs in their current configuration.

Table V-1 2010 Statewide OMT Emissions

Emission Source	Emissions (tpd)
Diurnal Losses from Tanks	1.70
Permeation from Hoses and Bulbs	1.18
Leaks	1.71
Total OMT Emissions	4.59

3) Emission Reductions

The Staff proposed regulation will reduce ROG emissions from OMT tanks and components by 4.2 tpd in 2020 compared to the uncontrolled emissions of 5.6 tpd. The 2020 controlled emissions are estimated to be 1.4 tpd of ROG. This is a reduction of about 75 percent. Slightly more emissions will be reduced when the total population of OMTs is fully replaced in 2028. Table V–2 summarizes the 2020 Statewide emissions from OMTs that are uncontrolled and controlled assuming 10 years of implementation.

Table V–2 2020 Statewide OMT Emissions

Emission Source	Uncontrolled Emissions (tpd)	Controlled Emissions (tpd)
Diurnal Losses from Tanks	2.04	1.12
Permeation from Hoses and Bulbs	1.13	0.15
Leaks	4.43	0.13
Total OMT Emissions	5.60	1.40

C) Economic Impact

1) Costs Savings from Preventing Fuel Losses

Staff estimates combined annual fuel losses from diurnal emissions, leaks from tanks, permeation emissions from hoses and primer bulbs account for about 4.6 gallons of gasoline per tank. At a cost of \$3.50 per gallon this is a cost of about \$16 per tank. With an estimated 200,000 uncontrolled OMTs statewide in 2010 this amounts to more than \$3.2 million in costs from lost fuel. Over the expected 18 years needed to replace the population of uncontrolled OMTs, the cost savings from lost fuel is estimated at about \$32 million (fewer uncontrolled tanks are replaced each year). The methodology used to estimate the cost savings associated with these recovered losses is detailed in Appendix G. Table V–3 summarizes the annual losses associated with tanks, hoses and bulbs.

Table V–3 Gallons of Gasoline Lost per Year

Gallons of Gasoline Lost Per Component	
Tank	3.29
Cap	0.26
Hose	0.68
Bulb	0.36
Total	4.59

2) Compliance Costs

The total cost from the proposed regulation is estimated to be \$4.4 million. This includes the retail cost of making improvements to the OMTs sold in

California (\$4.1 million), the cost of certifying under the provisions of the proposed regulation (\$40,000), and the administrative cost to ARB (about \$300,000). The methodology for estimating the compliance costs and savings is contained in Appendix H.

The combined retail cost increase per tank for compliance with the proposed performance standards is estimated to be \$10. Table V–4 summarizes the projected retail cost increase per tank and component associated with compliance with the proposed performance standards.

Table V–4 Projected Retail Cost Increase

Component	Retail Cost Increase		
	Low	High	Average
Tank	\$1.26	\$7.44	\$4.35
Cap	\$1.29	*	\$1.29
Fuel Hose	\$2.26	*	\$2.26
Primer Bulb	\$1.16	\$3.23	\$2.20
		Total	\$10.10

* No range for costs were provided

Based on the projected number of tanks, caps, hoses and bulbs replaced over the expected useful life of the component, the Statewide retail cost of compliance is estimated to be about \$4.1 million. Table V–5 summarizes the projected retail costs of compliance over the life of the component.

Table V–5 Projected Component Lifetime Retail Cost

Component	Life Span	Number of Components	Cost per Component	Total Component Cost
Tank	2011 – 2028 (18 years)	384,809	\$4.35	\$1,673,918
Cap	2010 – 2027 (18 years)	386,380	\$1.29	\$498,430
Hose	2010 – 2024 (15 years)	444,826	\$2.26	\$1,005,308
Bulb	2011 – 2025 (15 years)	443,017	\$2.20	\$972,423
			Total	\$4,150,079

Certification costs of the proposed regulation are estimated to be \$40,000. Certification costs include the cost to certify families of each tank and component for two to three manufacturers.

The State may incur administrative costs to include salary and benefits for additional Air Pollution Specialists to enforce the OMT proposed regulation. This administrative cost is estimated to be \$300,000. Appendix I identifies the administrative costs.

3) Cost Effectiveness

ARB staff estimates that this proposed regulation will result in a reduction of approximately 90 million pounds of ROG and a cost savings of about \$0.30 per pound of ROG reduced. The cost effectiveness analysis is based on the following items and is contained in Appendix J:

- (i) Fuel savings based on a cost of \$3.50 per gallon;
- (ii) Cost of the proposed regulation which is based on the total number of OMT tanks and components sold; and,
- (iii) Pounds of ROG reduced from the proposed performance standards over a period of time needed to replace the OMT population. Table V-6 summarizes the cost effectiveness of the proposed regulation.

Table V-6 Cost Effectiveness of Proposed Regulation

Cost and Net Cost-Savings Over the Useful Life of OMTs				
Regulation Cost	Cost Savings (\$3.50/gal)	Net Cost Savings	ROG Reduced (lbs)	Cost Savings (\$/lb ROG)
\$4,487,429	\$31,965,889	\$27,478,460	89,887,014	0.31

D) Fiscal Impacts

Staff does not expect the proposed regulation to impose an unreasonable cost burden on retail businesses located in California or on implementing government agencies. Manufacturers are located outside California and are currently providing components for other source categories that are compliant with similar performance standards.

1) Impacts on California Businesses

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.

ARB staff finds that there are no significant economic impacts to business within California due to the proposed performance standards or implementation schedule. Businesses potentially affected by the proposed regulation include manufacturers of OMT tanks and components. The proposed regulation will impose additional certification costs on OMT tank and component manufacturers. The potential impact on a retail customer is an increase in the initial cost of the OMT tank and associated components

offset by a fuel savings over the life of the OMT. These costs are discussed in the compliance costs and savings. The proposed regulation is not expected to have an adverse impact on the status of California businesses. Manufacturers of OMTs are located outside of the State and are expected to pass cost increases on to the consumer. The consumer will ultimately benefit from the fuel savings associated with reduced fuel losses.

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, local agency and 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 significant costs to any State, local agency or school district imposed by the proposed regulation. ARB staff did identify a potential cost to ARB related to additional positions that may be needed to enforce the regulation. Staff does not expect an adverse impact on other State or local agencies. The increase in the cost of OMTs to State and local agencies, like the California Department of Fish and Game or local law enforcement and rescue agencies will be offset by the fuel savings associated with new OMTs.

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 a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year. This regulation does not exceed this threshold.

E) 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, rule, 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.

The policies developed apply to all communities in California, but recognize that environmental justice issues have been raised more often in the context of low income and minority communities, which sometimes experience higher exposures to some pollutants as a result of the cumulative impacts of air pollution from multiple mobile, commercial, industrial, area wide, and other sources. Over the past twenty years, the ARB, local air districts, and federal air pollution control programs have made substantial progress towards improving the air quality in California. However, some communities continue to experience higher

exposures than others as a result of the cumulative impacts of air pollution from multiple mobile and stationary sources and thus may suffer a disproportionate level of adverse health effects. Since the same Ambient Air Quality Standards apply to all regions of the State, all communities, including environmental justice communities, will benefit from the air quality benefits associated with this proposal. Alternatives to the proposed recommendations, such as not implementing the proposal, would affect all communities throughout the State.

VI ALTERNATIVES

A) Introduction

In accordance with Government Code Section 11346.5, subdivision (a)(13), ARB must determine that no reasonable alternative it considered or that has otherwise been identified and brought to ARB'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.

No alternative proposed regulations were identified. The proposed regulation is designed to transfer existing technologies to reduce ROG_s from OMT_s. In addition to the current proposed regulation staff evaluated the option of maintaining the status quo through no action.

B) No Action

Because the EPA is in the process of implementing a similar control strategy with basically the same implementation dates it is possible that most of the emission reductions would occur if the ARB took no action. However, based on past experiences, control strategies for similar source categories without a California specific enforcement program have not resulted in the expected emission reductions. The proposed regulation would allow a California enforcement program that could sample and test for compliance to ensure the proposed performance standards are met. The no action alternative would result in no California enforcement program and would likely produce less improvement in air quality. Staff rejected this alternative as it does not ensure air quality benefits and does not address the existing problem.

VII MAJOR ISSUES IDENTIFIED AND DISCUSSED

During the workshops, the proposed regulation and emission test results were presented to the stakeholders for review and comment. Staff accepted comments and recommendations from stakeholders, identified specific issues of concern and addressed the issues to the extent possible. Although the ARB staff believes there are no major issues left unresolved, the following list some of the issues discussed. For a complete list of issues and staff responses see Appendix K.

A) Grandfathering of OMT Tanks and Components

Will the proposed regulation allow the sale of OMT tanks and components manufactured prior to the compliance dates?

Yes, the proposed regulation applies to OMT tanks and components manufactured after the compliance dates as specified in the proposed regulation and therefore those OMT tanks and components manufactured prior to the compliance date would not be subject to the proposed performance standards.

B) Notification of Suppliers

The proposed regulation as presented at the April 10, 2008 workshop required the notification and consent of suppliers prior to use of their product in an OMT system. This seemed burdensome to some manufacturers.

Staff responded by creating a definition of OMT system and requiring only a list of suppliers.

C) Compliance Dates

The proposed regulation as presented at the April 10, 2008 workshop included a compliance date for low permeation hoses of January 1, 2009 to be consistent with the EPA requirements. Manufacturers of fuel hoses were concerned that there was not enough time between adoption and the compliance deadline.

Staff agreed and changed the compliance date for low permeation fuel hoses to January 1, 2010.

D) ARB RFG III with 10 Percent Ethanol

If a manufacturer is certifying an OMT tank or component for California use, testing must be completed with CA reformulated gasoline III with 10 percent ethanol by volume (RFG III-E10). Some manufacturers expressed concern about the availability of this fuel and the reasonability of using this fuel.

Staff has found that this fuel is easily obtainable throughout the US. As for the reasonability of using this fuel, staff makes the following observations:

- 1) RFG III-E10 is the most aggressive fuel in terms of permeation that is currently available. The current RFG III requirements allows up to a maximum of 10 percent ethanol by volume, although the average content is approximately 8.1 percent ethanol by volume. Demonstrating compliance with the requirements through testing with RFG III-E10 assures that the component will meet the permeation proposed performance standards while using a more aggressive fuel; and,*
- 2) The ability to perform consistent compliance testing is dependent on the use of consistent parameters one of which is the use of a consistent fuel. Staff believes that consistent fuel is RFG III-E10.*

VIII CONCLUSION AND RECOMMENDATION

A) Introduction

This section of the staff report presents conclusions and recommendations consistent with the data and evidence presented throughout the staff report.

B) Conclusions

The staff proposed regulation has been developed using the principle of technology transfer and will achieve ROG emission reductions through technologies that are technically feasible and cost effective. The emission reductions from portable outboard marine tanks and components are significant and rely on existing technologies that are readily available and transferable. OMTs are yet another source category in the gasoline transport, distribution and use chain that lends itself to cost effective controls. Staff believes that the proposed regulation is achievable using current permeation and evaporative control technology. Through an extensive public outreach effort, there are no remaining unresolved stakeholder issues. The proposed regulation will help the State make progress toward achieving the National and State Ambient Air Quality Standards.

C) Recommendations

Staff recommends that the Board approve the proposed regulation to adopt Sections 2468 to 2468.10 of Title 13, California Code of Regulations; Certification Procedure 510, Certification Procedure for Portable Outboard Marine Tanks and Components; Test Procedure 511, Diurnal Rate from Portable Outboard Marine Tanks; and Test Procedure 512, Permeation Rate from Portable Outboard Marine Tank Fuel Hoses and Portable Outboard Marine Tank Primer Bulbs.

IX REFERENCES

Collins, W. J., R. G. Derwent, C. E. Johnson, and D. S. Stevenson (2002): The oxidation of organic compounds in the troposphere and their global warming potentials. *Climatic Change*, 52(4), 453–479.

Intergovernmental Panel on Climate Change (IPCC), Chapter 2, Changes in Atmospheric Constituents and in Radiative Forcing. In: *Climate Change 2007: The Physical Sciences Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>. 2007. (IPCC, FAR, 2007)

72-FR-28098 Proposed Emission Standards for New Nonroad Spark-Ignition Engines, Equipment, and Vessels

Society of Automotive Engineers (SAE), “Surface Vehicle Standard J1527 Marine Fuel Hoses”, March 2004 Edi

X APPENDICES

- A) Proposed Regulation Order Portable Outboard Marine Tanks and Components**
- B) Certification Procedure for Portable Outboard Marine Tanks and Components**
- C) Portable Outboard Marine Tank Test Procedure: TP-511 Diurnal Rate from Portable Outboard Marine Tanks**
- D) Portable Outboard Marine Tank Test Procedure: TP-512 Permeation Rate from Portable Outboard Marine Tank Fuel Hoses and Portable Outboard Marine Tank Primer Bulbs**
- E) Analysis of the 2007 California Survey of Outboard and Sailboat Owners Regarding Use of Portable Outboard Marine Tanks**
- F) Portable Outboard Marine Tank and Component Test Results**
- G) Cost Savings**
- H) Costs of Proposed Regulation**
- I) Fiscal Impact on State Government**
- J) Economic and Fiscal Impact**
- K) Workshop Issues and Responses**