BOARD MEETING DATE: June 1, 2012 AGENDA NO. 31

PROPOSAL: Adopt Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing

SYNOPSIS: The proposed rule will reduce fugitive VOC emissions released during the transfer and dispensing of Liquefied Petroleum Gas (LPG) at residential, commercial, industrial, chemical, agricultural and retail sales facilities. The rule applies to the transfer of LPG to and from stationary storage tanks, cylinders and cargo tanks, including bobtails, truck transports and rail tank cars, and into portable refillable cylinders. The proposed rule will require the use of low emission fixed liquid level gauges or equivalent alternatives during filling of LPG-containing tanks and cylinders, use of LPG low emission connectors, routine leak checks and repairs of LPG transfer and dispensing equipment, and recordkeeping and reporting to demonstrate compliance. The proposed rule does not apply to facilities subject to Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants.

COMMITTEE: Stationary Source, January 20, 2012, Reviewed

RECOMMENDED ACTIONS:
Adopt the attached resolution:

1. Certifying the CEQA Final Environmental Assessment for Proposed Rule 1177 - Liquefied Petroleum Gas Transfer and Dispensing;
2. Adopting Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing.

Barry R. Wallerstein, D.Env.
Executive Officer

EC:LT:NB:DO:KE

Background
Fugitive Volatile Organic Compound (VOC) emissions associated with the transfer and dispensing of LPG are currently not accounted for or regulated by the South Coast Air Quality Management District (District) or the CARB, with the exception of facilities covered under the scope of Rule 1173 – Control of Volatile Organic Compound Leaks and releases from components at Petroleum Refineries and Chemical Plants.

The District initiated development of Proposed Rule (PR) 1177 - Liquefied Petroleum Gas Transfer and Dispensing in August 2010 and has worked extensively with industry in order to review and evaluate the varied processes for dispensing LPG, address comments and concerns, and develop a rule with consensus from the working group comprised of the Western Propane Gas Association, its members, and others representing industry, as well as the public. Staff has conducted seven working group meetings and participated in thirteen site visits and incorporated overall feedback through multiple proposed rule language iterations.

LPG, which is a gas at atmospheric conditions, is stored under pressure to maintain its liquid state. Reducing fugitive VOC emissions during the transfer and dispensing of LPG equates to reducing product loss and therefore, in addition to the air quality benefits, it would also result in potential cost-savings and increased safety for industry and the consumer. The processes contributing to fugitive VOC emissions include delivery and transfer of LPG to residential, industrial and commercial users, fueling stations and for cylinder refueling. The residential and chemical sectors represented the largest sales distribution, contributing 40 percent and 20 percent, respectively to overall LPG sales. However, the internal combustion engine (ICE) sector, which includes forklift cylinder filling and the sales to retail sector which includes barbecue cylinder refilling and exchange, are responsible for the majority of the total baseline VOC emissions and also VOC reductions.

Summary of Rule 1177 Proposed for Adoption
The proposed rule applies to the transfer of LPG to and from stationary storage tanks, cylinders and cargo tanks, including bobtail trucks, tanker or transport trucks and railroad tank cars, as well as into portable tanks and cylinders. The following summarizes key proposed requirements:

- Require use of LPG low emission connectors to limit the discharge of LPG upon disconnection to four cubic centimeters or less by July 1, 2013.
- Require that all LPG-receiving containers be filled using a low emission fixed liquid level gauge (FLLG) by July 1, 2017 or through use of an equivalent, alternative technique or technology that does not require the FLLG to be open to comply with fire protection laws.

- Implement a Leak Detection and Repair program that requires routine leak checks using a simple bubble test of LPG low emission connectors, as well as repair and proper maintenance of any installed vapor recovery or equalization system.
- Require records of all low emission FLLG and LPG low emission connector installations, leak repairs, and vapor recovery and equalization system maintenance.
- Require annual reports for LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user, including monthly purchase and dispensing volumes for calendar years 2013 through 2015, end of year inventories of all containers and associated low emission FLLGs for calendar years 2013 through 2017, and low emission connectors installed for calendar year 2013.
- Exemptions provided for containers with a water capacity of less than 4 gallons, LPG cylinders that are specifically dedicated for and installed for use with recreational vehicles, and for facilities that are subject to the requirements of Rule 1173.

Emission Inventory and Emission Reduction
The emissions inventory from the transfer and dispensing of LPG is estimated at 8.6 tons per day. Based on LPG low emission connector and low emission FLLG technologies that are currently available, Proposed Rule 1177 will reduce 6.1 tons per day VOC emissions upon full implementation.

AQMP and Legal Mandates
The California Health and Safety Code requires the AQMD to adopt an Air Quality Management Plan (AQMP) to meet state and federal ambient air standards in the Basin. In addition, the California Health and Safety Code requires that the AQMD adopt rules and regulations that carry out the objectives of the AQMP. The proposed rule partially implements control measure MCS-07-Application of All Feasible Measures from the 2007 AQMP.

Cost-Effectiveness
Staff has estimated the cost-effectiveness to be $1,700 per ton of VOC reduced from the use of low emission technology. The range of cost-effectiveness is within that for other VOC rules adopted by the Board.

California Environmental Quality Act
Pursuant to California Environmental Quality Act (CEQA) Guidelines §15252 and §15162 and AQMD Rule 110, the AQMD has prepared an Environmental Assessment (EA) for proposed Rule 1177. The environmental analysis in the Draft EA concluded

that proposed Rule 1177 would not generate any significant adverse environmental impacts. The Draft EA was released for a 30-day public review and comment period from April 3, 2012 to May 2, 2012 and one comment letter was received from the public regarding the Draft EA. Responses to the comments received have been prepared and the comment letter and its responses are included as Appendix C of the EA.

Since the release of the Draft EA, minor modifications have been made to the document. However, none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the Draft EA pursuant to CEQA Guidelines §15073.5. Therefore, the Draft EA is now a Final EA and is included as an attachment to this Governing Board package.

Socioeconomic Analysis

Proposed Rule 1177 would affect LPG dealers/distributors (NAICS 454312), petroleum bulk stations and terminals (NAICS 424710), and retail facilities, the latter including both gasoline stations (NAICS 447190) and general rental centers (NAICS 532310) of roughly equal distribution. The majority of the affected facilities are small businesses.

The total average annual cost of PR 1177 is estimated to be $4.28 million from 2013 to 2025. Out of $4.28 million cost, LPG dealers/distributors would incur about $3 million (70 percent of the total cost) at $120,000 per dealer/distributor. The average annual cost of petroleum bulk stations & terminals, including those involved in gravity filling forklift cylinders is estimated to be $1.21 million (or about $6,060 per facility). The average annual cost of gasoline stations and general rental centers is estimated to be $0.07 million (or about $106 per facility).

PR 1177 is projected to have 21 jobs forgone annually in the entire four-county economy between 2013 and 2025, which is 0.0002 percent of the baseline jobs in the four-county area and is considered to be within the noise of the economic model employed for this analysis. The analysis above does not include potential savings from reduced product loss expected to result from the fugitive emission reduction efforts, which are expected to greatly offset the estimated impacts.

Implementation and Resource Impacts

Existing AQMD resources will be sufficient to implement the proposed rule with minimal impact on the budget.

Attachments

A. Summary of Proposed Rule
B. Rule Development Process
C. Key Contacts
D. Resolution
E. Rule Language
F. Final Staff Report
G. Final Environmental Assessment
H. Final Socioeconomic Assessment

ATTACHMENT A
SUMMARY OF PROPOSED RULE

Installation of LPG Low Emission Connectors; PR 1177 (d)(2)(A)

Effective July 1, 2013, require the use of LPG low emission connectors for transfer and dispensing of LPG to limit the discharge of LPG upon disconnection to four cubic centimeters or less

Installation of Low Emission Fixed Liquid Level Gauges (FLLG); PR 1177 (d)(2)(B), (d)(2)(C) and (d)(2)(D)

Require that LPG-receiving containers that are filled using a fixed liquid level gauge (FLLG) or "bleeder valve" as an overfill prevention device be equipped with a low emission FLLG (number 72 size orifice or equivalent) according to the following schedule:

For owned or leased stationary storage tanks:

- For new or re-serviced owned or leased stationary storage tanks effective July 1, 2013 ;
- For owned or leased stationary storage tanks that can be retrofitted in the field effective July 1, 2015; and
- For all other owned or leased stationary storage tanks by July 1, 2017;

For cargo tanks:

- Immediately, for any cargo tank manufactured on or after July 1, 2013; and
- For all other cargo tanks by July 1, 2013 or as soon thereafter at the next service in which the cargo tank is evacuated, but no later than July 1, 2017; and

For portable tanks and cylinders by July 1, 2017

Implementation of a Leak Detection and Repair Program; PR 1177 (e)

- Require daily physical inspections for leaks at LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user
- Require proper maintenance of vapor recovery and equalization systems at bulk loading facilities
- Require a quarterly leak check inspection of LPG connectors using a bubble test at LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user
- Require removal from service and repair of leaking connectors prior to returning to service at bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user

Recordkeeping; PR 1177 (f)(1) and (f)(2)

- Require recordkeeping of all low emission FLLG and LPG low emission connectors installed
- Require records of leak repairs
- Require vapor recovery and equalization system maintenance records

Reporting; PR 1177 (g)

- Require annual reports of monthly purchase and dispensing volumes for calendar years 2013, 2014, and 2015 for LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user
- Require reporting of end of year inventories of all containers and associated low emission FLLGs for calendar years 2013 through 2017 and low emission connectors installed for calendar year 2013

Exemptions; PR 1177(j)

- Containers with a water capacity of less than 4 gallons into which LPG is transferred
- LPG cylinders that are specifically dedicated for and installed for use with recreational vehicles
- Facilities that are subject to the requirements of Rule 1173

ATTACHMENT B
RULE DEVELOPMENT PROCESS
Proposed Rule 1177 – LPG Transfer and Dispensing

Beginning of Rule Development Process
August 2010

⇩

Meetings with Industry
December 1, 2010 – February 24, 2012
(7 Working Group Meetings and 13 Site Visits)

⇩

Public Workshop
August 25, 2011

⇩

Stationary Source Committee Meeting
January 20, 2012

⇩

Set Hearing
May 4, 2012

⇩

Public Hearing
June 1, 2012

(22) months spent in rule development

ATTACHMENT C
KEY CONTACTS LIST

Affected Facilities

Amerigas
Delta Liquid Energy
Expo Propane
Ferrellgas
Heritage Propane
Mutual Propane
Pacific Coast Propane
Sal's Propane
Southern California Edison Co.
Suburban Propane
Ted Johnson Propane
Wood Propane

Other Affected Facilities and Association

AC Propane
Alliance Propane Services
Anza Gas Services
Avcogas Propane Sales and Services
Boeing Corporation
Forest Lawn
Globe Gas Corporation
KC Propane
Lamanco, Inc.
Phelan Gas Company
Trans Gas Company
Walker Propane, Inc.
Wessel Propane, Inc.
Western Propane Gas Association
Western Propane Services, Inc.
World Famous Propane

Other Interested Parties

California Air Resources Board
Coalition for Clean Air
Fullerton Fire Department
L.A. County Sanitation District
National Fire Protection Association (NFPA)
Raymond Regulatory Resources (Consultants)
The Adept Group Inc. (Consultants)

ATTACHMENT D

RESOLUTION NO. 2012-____

A Resolution of the South Coast Air Quality Management District (AQMD) Governing Board certifying the Final Environmental Assessment for Proposed Rule 1177 - Liquefied Petroleum Gas Transfer and Dispensing.

A Resolution of the AQMD Governing Board adopting Rule 1177 - Liquefied Petroleum Gas Transfer and Dispensing.

WHEREAS, the AQMD Governing Board approved the final Air Quality Management Plan in June 2007, which included Control Measure MCS-07 to ensure the application of all feasible measures; and

WHEREAS, volatile organic compounds are precursors to ozone (O3) which the U.S. Environmental Protection Agency (EPA) has identified as an air contaminant and has set criteria air pollutant national ambient air quality standards for ozone (O3) and the South Coast Air Basin has not yet attained these air quality standards and is exceeding the corresponding state standards by an even greater margin; and

WHEREAS, the AQMD staff conducted a public workshop regarding Proposed Rule 1177; and

WHEREAS, the AQMD Governing Board has determined with certainty that Proposed Rule 1177 is considered a "project" pursuant to the terms of the California Environmental Quality Act; and

WHEREAS, the AQMD has had its regulatory program certified pursuant to Public Resources Code Section 21080.5 and has conducted CEQA review pursuant to such program (AQMD Rule 110); and

WHEREAS, AQMD staff has prepared a Draft Environmental Assessment (EA) pursuant to its certified regulatory program and CEQA Guidelines Section 15252, setting forth the potential environmental consequences of Proposed Rule 1177; and

WHEREAS, the Draft EA was circulated for a 30-day public review from April 3, 2012 to May 2, 2012; and

WHEREAS, one comment letter was received relative to the analysis presented in the Draft EA and responses were prepared for each individual comment in the letter. None of the individual comments in this comment letter identified any

potentially significant adverse impacts from the proposed project, and the Draft EA has been revised such that it is now a Final EA; and

WHEREAS, a finding pursuant to Public Resources Code section 21031 and CEQA Guidelines section 15091 and a Statement of Overriding Considerations pursuant to CEQA Guidelines section 15093 were not prepared because the environmental impacts are not significant and thus, not required; and

WHEREAS, it is necessary that the adequacy of the Final EA, including responses to comments, be determined by the AQMD Governing Board prior to its certification; and

WHEREAS, a Mitigation Monitoring Plan pursuant to Public Resources Code Section 21081.6, has not been prepared since no mitigation measures are necessary; and

WHEREAS, the AQMD Governing Board voting on Proposed Rule 1177, has reviewed and considered the Final EA, including responses to comments prior to its certification; and

WHEREAS, the AQMD Governing Board finds and determines, taking into consideration the factors in Section (d)(4)(D) of the Governing Board Procedures, that the modifications which have been made to Proposed Rule 1177, since notice of public hearing was published do not significantly change the meaning of the proposed rule within the meaning of the Health and Safety Code Section 40726 and would not constitute significant new information requiring recirculation of the Draft EA pursuant to CEQA Guidelines Section 15073.5; and

WHEREAS, California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report; and

WHEREAS, the AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Sections 39002, 39650, 40000, 40001 and 40440, 40441, 40463, and 40725 through 40728, and 41508 of the California Health and Safety Code; and

WHEREAS, the AQMD Governing Board has determined that a need exists to adopt Proposed Rule 1177 to partially implement Control Measure MCS-07 – Application of All Feasible Measures from the 2007 AQMP and help the AQMD attain the National Ambient Air Quality Standard for ozone for which AQMD is classified as an Extreme Non-Attainment Area; and

WHEREAS, the AQMD Governing Board has determined that Proposed Rule 1177 is written and displayed so that the meaning can be easily understood by persons directly affected by it; and

WHEREAS, the AQMD Governing Board has determined that Rule 1177, as proposed, is in harmony with, and not in conflict with, or contradictory to, existing statutes, court decisions, or state or federal regulations; and

WHEREAS, the AQMD Governing Board has determined that Rule 1177, as proposed, does not impose the same requirement as any existing state or federal regulation, except to the extent they are necessary and proper to execute the powers and duties granted to, and imposed upon the AQMD; and

WHEREAS, the AQMD Governing Board has determined that by adopting PR 1177, the AQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Section 40001(rules to achieve ambient air quality standards), 40440 (a)(rules to carry out the AQMP), 40440 (c)(cost effectiveness), and 40910 et seq., (California Clean Air Act); and

WHEREAS, adoption of Proposed Rule 1177 will alleviate a problem, that is the Basin is in non-attainment of the federal ozone standards, and the proposed rule will promote attainment of this standard; and

WHEREAS, the AQMD Governing Board has determined that the Socioeconomic Impact Assessment for Proposed Rule 1177 is consistent with the March 17, 1989 and October 14, 1994 Governing Board Socioeconomic Resolutions for rule adoption; and

WHEREAS, the AQMD Governing Board has determined that the Socioeconomic Impact Assessment is consistent with the provisions of Health and Safety Code Sections 40440.8, 40728.5 and 40920.6; and

WHEREAS, the AQMD Governing Board has determined that Proposed Rule 1177 will result in increased costs to the industry, yet are considered to be reasonable, with a total annualized cost as specified in the Final Socioeconomic Impact Assessment; and

WHEREAS, the AQMD Governing Board has determined that Proposed Rule 1177, is cost-effective as demonstrated in the Final Socioeconomic Impact Assessment; and

WHEREAS, the AQMD Governing Board has actively considered the socioeconomic impact assessment and has made a good faith effort to minimize such impacts; and

WHEREAS, the AQMD Governing Board has determined that Rule 1177 should be adopted for the reasons contained in the staff report; and

WHEREAS, a public hearing has been properly noticed in accordance with all provisions of Health and Safety Code, Section 40725; and

WHEREAS, the AQMD Governing Board has held a public hearing in accordance with all provisions of law, inclusive of Health and Safety Code Section 40726; and

NOW, THEREFORE, BE IT RESOLVED, that the AQMD Governing Board does hereby certify that the Final EA for Proposed Rule 1177 was completed in compliance with CEQA and Rule 110 provisions; and finds that the Final EA was presented to the Governing Board, whose members reviewed, considered and approved the information therein prior to acting on Proposed Rule 1177; and

BE IT FURTHER RESOLVED, that because no significant adverse environmental impacts were identified as a result of implementing Proposed Rule 1177, a finding pursuant to Public Resources Code section 21031 and CEQA Guidelines section 15091, a Statement of Overriding Considerations pursuant to CEQA Guidelines section 15093, and a Mitigation Monitoring Plan pursuant to Public Resources Code section 21031.6 and CEQA Guidelines 15097 are not required; and

BE IT FURTHER RESOLVED, that the AQMD Governing Board does hereby adopt, pursuant to the authority granted by law, Proposed Rule 1177, as set forth in the attached, and incorporated herein by this reference.

DATE: _____ _____

CLERK OF THE BOARDS

ATTACHMENT E

(Proposed ~~*Rule*~~ June 1, 2012)

PROPOSED RULE 1177. LIQUEFIED PETROLEUM GAS TRANSFER AND DISPENSING

(a) Purpose

The purpose of this rule is to reduce emissions of volatile organic compounds (VOCs) associated with the transfer and dispensing of liquefied petroleum gas (LPG).

(b) Applicability

This rule applies to the transfer of LPG from any cargo tank, stationary storage tank or cylinder into any other cargo tank, stationary storage tank, cylinder, or portable storage tank.

(c) Definitions

For the purpose of this rule the following definitions shall apply:

(1) BOBTAIL TRUCK is a vehicle that is equipped with a cargo tank without a trailer and is used to deliver propane.

(2) BUBBLE TEST is the application of a soap solution, detergent, aerosol spray or similar material that promotes the formation of bubbles at the site of any potential LPG vapor leak source and observing for bubbles.

(3) CARGO TANK is a container that is used to transport LPG and is either mounted on a conventional truck chassis or is an integral part of a cargo transporting vehicle, such as a bobtail, mobile fueler or rail tank car.

(4) CONNECTOR is any component, including an adapter, hose, fitting, valve or coupling that is used to facilitate the transfer of LPG from one container to another, and that is disconnected following completion of an LPG transfer or dispensing activity.

(5) CONTAINER is any vessel, including cylinders, stationary tanks, portable storage tanks, and cargo tanks, used for the transporting or storage of LPG.

(6) CYLINDER is a container designed, constructed, tested and marked in accordance with U.S. Department of Transportation (DOT) specifications, Title 49, Code of Federal Regulations or in accordance with a valid DOT special permit.

(7) FILL BY WEIGHT is the filling of an LPG container without use of an FLLG and monitoring the fill level to prevent overfilling by weighing the container and the LPG in the container and limiting the filling to no more than the rated maximum capacity.

(8) FIXED LIQUID LEVEL GAUGE (FLLG) is a liquid level indicator that uses a positive shutoff vent valve to indicate that the liquid level in a container being filled has reached the point at which the indicator communicates with the liquid level in the container.

(9) INSPECTION is a physical survey of all LPG connectors for evidence of leakage through use of a bubble test. Use of a test method in accordance with subdivision (h) may be substituted for an inspection.

(10) LIQUID TIGHT is a visible liquid leak rate not exceeding three drops per minute or exhibiting a visible liquid mist.

(11) LOW EMISSION FLLG is fixed liquid level gauge with a number 72 orifice size (0.025 inch) or physical configuration that results in an equivalent or lower emission rate that is tested and demonstrated using a method for which written approval of the Executive Officer has been obtained.

(12) LPG or LIQUEFIED PETROLEUM GAS is an organic compound having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane) and to a lesser extent butylenes, and that is stored and transported under pressure in a liquid state.

(13) LPG BULK LOADING FACILITY is an LPG transfer and dispensing facility where the primary function is to store LPG for further distribution and has one or more stationary storage tanks with a water capacity of 10,000 gallons or more.

(14) LPG LOW EMISSION CONNECTOR is any component, including an adapter, hose, fitting, valve or coupling that is used to facilitate transfer of LPG from one container to another and that is designed to result in a maximum emission release of four (4) cubic centimeters of LPG when disconnected.

(15) LPG TRANSFER AND DISPENSING FACILITY is a mobile fueler or a stationary facility consisting of one or more stationary storage tanks and associated equipment which receives, stores and either transfers or

dispenses LPG to stationary storage tanks, cargo tanks, or portable storage tanks.

(16) LPG VAPOR RECOVERY OR EQUALIZATION SYSTEM is a system installed on an LPG mobile fueler or a rail tank car that facilitates the transfer of liquid LPG and allows for the collection and recovery of LPG vapors displaced or emitted from the stationary storage tank, or cargo tank when LPG is transferred to or from the mobile fueler or rail tank car.

(17) LPG VAPORS are the organic compounds in vapor form as well as entrained liquid LPG displaced during LPG transfer and dispensing operations.

(18) MOBILE FUELER is any tanker truck or trailer, including a bobtail truck, which is used to transport LPG stored in an onboard cargo tank.

(19) OWNER/OPERATOR is any person who owns, leases, or operates any facility subject to this rule.

(20) PORTABLE CYLINDER is a container that is designed, constructed, tested and marked in accordance with U.S. Department of Transportation (DOT) specifications, Title 49, Code of Federal Regulations or in accordance with a valid DOT special permit. Examples of portable cylinders that contain LPG include those used with small hand torches, forklifts, barbecue grills and agricultural weed burners.

(21) PORTABLE STORAGE TANK is a container or portable cylinder designed to be moved readily, as opposed to a container or stationary cylinder designed for stationary installations.

(22) RAILROAD TANK CAR is a mounted cargo tank designated for transport over rail.

(23) STATIONARY CYLINDER is the largest DOT approved cylinder and is typically used in residential, commercial and industrial applications.

(24) STATIONARY STORAGE TANK is a container that is used for the storage of LPG, including, but not limited for residential, commercial or industrial usage, and includes containers constructed in accordance with the American Society of Mechanical Engineers Code .

(25) VALVE is a device that regulates or isolates the fluid flow in a pipe, tube, tank, or conduit by means of an external actuator.

(26) VAPOR TIGHT is the leak-free condition of LPG connectors established in accordance with the provisions of subdivision (h).

(d) Equipment and Operation Requirements

(1) LPG transfer at LPG Bulk Loading Facilities

Effective July 1, 2013, an owner/operator of an LPG bulk loading facility shall not transfer, allow the transfer or provide equipment for the transfer of LPG, from any cargo tank to a stationary storage tank located at the facility or from any stationary storage tank to a cargo tank unless all the following conditions are met:

(A) Any railroad tank car or mobile fueler equipped with an LPG vapor recovery or equalization system is maintained and operated according to the specifications of the vapor recovery and equalization system manufacturer;

(B) All vapor return lines and liquid lines are properly connected between the cargo tank and the stationary storage tank so that associated connectors are maintained in a vapor tight and liquid tight condition during LPG transfer; and

(C) The transfer hose assembly, which includes the hose, fittings and gaskets, is properly maintained in order to maintain vapor tight conditions.

(2) LPG transfer at LPG Transfer and Dispensing Facilities

Effective July 1, 2013, an owner/operator of an LPG transfer and dispensing facility shall not transfer LPG from any stationary storage tank, cargo tank, or cylinder into any stationary storage tank, cargo tank, cylinder, portable storage tank, or vehicle fuel tank unless the specific containers meet the following applicable conditions:

(A) The stationary storage tank, cargo tank or cylinder used to transfer or dispense LPG is fitted exclusively with LPG low emission connectors that are maintained in a vapor tight and liquid tight condition except when actively connecting or disconnecting; and

(B) The leased or owned stationary storage tank meets one or more of the following conditions:

(i) The stationary storage tank FLLG is closed during LPG transfer, using a filling technique or technology that monitors the maximum fill level to prevent overfilling without use of the FLLG; or

(ii) The stationary storage tank is equipped with a low emission FLLG according to the following schedule:

(I) If the stationary storage tank is either put into or returned to service, it shall be equipped with a low emission FLLG; and

(II) If the stationary storage tank does not meet the provisions of subclause (d)(2)(B)(ii)(I), it shall be equipped with a low emission FLLG by July 1, 2015, or by July 1, 2017 if the owner/operator demonstrates through documentation prior to July 1, 2015 that the stationary storage tank being filled is equipped with an FLLG that cannot be retrofitted with a low emission FLLG in a safe manner without relocation of the stationary storage tank. Documentation shall be made available to the Executive Officer upon request; and

(C) The cargo tank, if equipped with a FLLG, meets one or more of the following conditions:

(i) The cargo tank FLLG is closed while being filled using a filling technique or technology that monitors the maximum fill level to prevent overfilling without use of the FLLG; or

(ii) The cargo tank FLLG is equipped with a low emission FLLG according to the following schedule:

(I) If manufactured on or after July 1, 2013, the cargo tank shall be equipped exclusively with one or more low emission FLLGs; or

(II) The cargo tank shall be equipped exclusively with one or more low emission FLLGs by July 1, 2013, or as soon thereafter at the next service in which the cargo tank is evacuated, but no later than July 1, 2017; and

(D) If the container is a cylinder or portable storage tank, the container shall meet one or more of the following conditions:

(i) The cylinder or portable storage tank FLLG is closed during LPG transfer, using a fill by weight technique or alternative technique or technology that monitors the

maximum fill level to prevent overfilling without use of the FLLG; or

(ii) The cylinder or portable storage tank is equipped with a low emission FLLG no later than July 1, 2017.

(e) Owner/Operator Leak Detection and Repair Program Requirements

Effective January 1, 2013, the owner/operator of any LPG bulk loading facility or any LPG transfer and dispensing facility that offers LPG for sale to an end user shall:

(1) On a daily basis, physically check all connectors involved with the transfer of LPG for evidence of leakage, such as the presence of odorant, hissing, or staining.

(2) Conduct an inspection as defined in paragraph (c)(9), for any owned or leased stationary storage tank or cargo tank used to supply LPG to any other stationary storage tank or cargo tank once every 90 days, or if the time between fillings is greater than 90 days, during or upon completion of a transfer of LPG.

(3) Conduct a periodic training program for any employee that implements the provisions of paragraph (e)(1) or (e)(2). The training program shall incorporate:

(A) Written training procedures;

(B) The training frequency and the scheduled training dates; and

(C) A written record of the dates of training provided for each employee.

(4) Remove from service any connector which is identified as leaking in accordance with paragraph (e)(1) or (e)(2). ~~*If t*~~The connector ~~*is to*~~ shall not be put back into service~~,~~ until the leaky connector ~~*shall be*~~ is repaired or replaced and inspected. An entry of such leak and repair/replacement activity shall be recorded in accordance with paragraph (f)(1) before the connector is returned to service. The identified leak repaired pursuant to this paragraph shall not constitute a violation of subparagraph (d)(1)(B) and (d)(2)(A).

(f) Recordkeeping Requirements

(1) Effective January 1, 2013, the following records shall be maintained for a period of at least two years and shall be made available to the Executive Officer upon request:

(A) A person who performs the installation of FLLGs or connectors, inspections, as defined by paragraph (c)(9), or repairs connectors at any LPG transfer and dispensing facility or any LPG bulk loading facility, shall provide the owner/operator with all applicable records listed below immediately after service is completed, and the owner/operator shall maintain all provided records:

(i) Records of all FLLGs and connectors installed.

(ii) Service or sales receipts or repair logs confirming follow-up repairs for any leaks identified and repaired in accordance with paragraph (e)(1) and (e)(2), which shall include:

(I) Date and time of each repair;

(II) The name of any person who performed the repair and, if applicable, the name, address and phone number of their employer;

(III) A description of the service performed; and,

(IV) Identification of the FLLG or connector that was installed, repaired, serviced or removed, such as FLLG or connector identification information and FLLG or connector manufacturer name.

(B) The owner/operator of any railroad tank car or mobile fueler equipped with an LPG vapor recovery or equalization system shall maintain records to demonstrate that the system is maintained and operated according to the specifications of the vapor recovery and equalization system manufacturer.

(2) The owner/operator of any LPG transfer and dispensing facility shall maintain and provide to the Executive Officer upon request, documentation that demonstrates that any connector or FLLG used to comply with subdivision (d) meets the definition of LPG low emission connector or low emission FLLG, respectively.

(g) Reporting Requirements

(1) By July 1 of each year from 2014 through 2016, the owner/operator of an LPG bulk loading facility or an LPG transfer and dispensing facility that offers LPG for sale to an end user shall submit an annual report containing the monthly LPG purchase volume and dispensing volume to the Executive Officer for the prior calendar year, in a format approved by the Executive Officer. The reporting facility shall maintain copies of all purchase and sales records used to support the submitted report for a period of at least two years, and make such records available to the Executive Officer upon request.

(2) In lieu of submitting the above annual report, the owner/operator of an LPG transfer and dispensing facility that offers LPG for sale to an end user shall meet all of the following conditions:

(A) Provide that all the facility's LPG suppliers for that prior calendar year include the name of the facility with the supplier's annual report and have the supplier notify the District and the facility by March 1 of the reporting year that the supplier will include the facility in its annual report.

(B) The facility shall maintain copies of all purchase records and notifications from all LPG suppliers for a period of at least two years, and make such records available to the Executive Officer upon request.

(3) By July 1, 2014, the owner/operator of an LPG bulk loading facility shall submit to the Executive Officer an end of year inventory of all facility located LPG low emission connectors, including all LPG low emission connectors installed on facility-owned or leased mobile fuelers associated with the transfer or storage of LPG for calendar year 2013. This inventory shall include the specific storage or transfer equipment or operation involved and the manufacturer and identification or part number of all low emission connectors.

(4) By July 1 of each year from 2014 through 2018, the owner/operator of an LPG bulk loading facility shall submit to the Executive Officer an end of year inventory of all facility located containers, including all facility-owned or leased mobile fuelers associated with the transfer or storage of LPG that are equipped with one or more FLLGs for the prior calendar year. This inventory shall include a summary, by size and classification,

and the associated number of installed low emission FLLGs, submitted in a form approved by the Executive Officer.

(h) Test Method

Measurements of leak concentrations shall be conducted according to the United State Environmental Protection Agency (U.S. EPA) Reference Method 21 using an appropriate analyzer calibrated with methane. The analyzer shall be calibrated before inspection on the day of inspection. For the purposes of this rule, a measurement at or below 10,000 ppm shall be considered to be vapor tight.

(i) Confidentiality of Information

Subject to the provisions of the California Public Records Act (Govt. Code § 6250-6276.48) information submitted to the Executive Officer may be designated as exempt from disclosure. The designation must be clearly indicated on the reporting form, identifying exactly which information is deemed exempt from disclosure. District guidelines require a detailed and complete basis for such claim in the event of a public records request.

(j) Exemptions

(1) The provisions of this rule shall not apply to the transfer of LPG into any container with a water capacity less than four (4) gallons.

(2) The provisions of this rule shall not apply to facilities that are subject to the requirements of Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants.

(3) The provisions of subparagraph (d)(2)(D) shall not apply to LPG cylinders that are specifically dedicated for and installed for use with recreational vehicles.

ATTACHMENT F

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Staff Report

Proposed Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing

June 2012

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EXECUTIVE SUMMARY

Fugitive Volatile Organic Compound (VOC) emissions associated with the transfer and dispensing of liquefied petroleum gas (LPG) are currently not accounted for or regulated by the South Coast Air Quality Management District (District) or the California Air Resources Board (CARB), with the exception of facilities covered under the scope of Rule 1173 – Control of Volatile Organic Compound Leaks and releases from components at Petroleum Refineries and Chemical Plants. The fugitive VOC emissions inventory from the transfer of LPG has been conservatively estimated to be 8.6 tons per day (tpd). Because LPG, which is a gas at atmospheric conditions, is stored under pressure to maintain its liquid state, reducing fugitive VOC emissions during the transfer and dispensing of LPG equates to reducing product loss and therefore, in addition to the air quality benefits, it would also result in potential cost-savings and increased safety for industry and the consumer.

The District initiated development of Proposed Rule (PR) 1177 - Liquefied Petroleum Gas Transfer and Dispensing in August 2010 and has worked extensively with industry in order to address their comments and concerns and arrive at a workable rule. Staff has conducted seven working group meetings and participated in thirteen site visits and incorporated overall feedback through multiple proposed rule language iterations.

The proposed rule will reduce fugitive emissions of VOCs from the transfer and dispensing of LPG at facilities not subject to Rule 1173 by an estimated 6.1 tons per day, at a cost-effectiveness of $1,700 per ton. The processes contributing to these emissions include delivery and transfer of LPG to residential, industrial and commercial users, fueling stations and for cylinder refueling. The proposed rule applies to the transfer of LPG to and from stationary storage tanks, cylinders and cargo tanks, including bobtail trucks, tanker or transport trucks and railroad tank cars, as well as into portable tanks and cylinders. PR 1177 includes the following requirements, as further summarized in Table 1:

- Installation of low emission connectors and valves
    - Effective July 1, 2013, require the use of LPG low emission connectors for transfer and dispensing of LPG to limit the discharge of LPG upon disconnection to four cubic centimeters or less;
    - Require that LPG-receiving containers that are filled using a fixed liquid level gauge (FLLG) or “bleeder valve” as an overfill prevention device be equipped with a low emission FLLG (number 72 size orifice or equivalent) according to the following schedule:
        - For owned or leased stationary storage tanks:

- For new or re-serviced owned or leased stationary storage tanks effective July 1, 2013 ;
- For owned or leased stationary storage tanks that can be retrofitted in the field effective July 1, 2015; and
- For all other owned or leased stationary storage tanks by July 1, 2017;

▪ For cargo tanks:

- Immediately, for any cargo tank manufactured on or after July 1, 2013; and
- For all other cargo tanks by July 1, 2013 or as soon thereafter at the next service in which the cargo tank is evacuated, but no later than July 1, 2017; and

▪ For portable tanks and cylinders by July 1, 2017

- Implementation of a Leak Detection and Repair Program
  - Require daily physical inspections for leaks at LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user;
  - Require proper maintenance of vapor recovery or equalization systems at bulk loading facilities;
  - Require a quarterly leak check inspection of LPG connectors using a bubble test at LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user; and
  - Require removal from service and repair of leaking connectors prior to returning to service at LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user;
- Recordkeeping
  - Require recordkeeping of all low emission FLLGs and LPG low emission connectors installed;
  - Require records of leak repairs; and
  - Require vapor recovery or equalization system maintenance records;

- Reporting
    - Require annual reports of monthly purchase and dispensing volumes for calendar years 2013, 2014, and 2015 for LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user, by July 1, of the following year; and
    - Require reporting of end of year inventories of all containers and associated low emission FLLGs for calendar years 2013 through 2017 and low emission connectors installed for calendar year 2013.
- Exemptions
    - Containers with a water capacity of less than 4 gallons into which LPG is transferred
    - LPG cylinders that are specifically dedicated for and installed for use with recreational vehicles
    - Facilities that are subject to the requirements of Rule 1173

Table 1. Summary of Proposed Rule 1177 Requirements

Requirement	Bulk Loading Facility	Transfer and Dispensing Facility	
		Offers LPG for Sale to End User	Other
LPG Low Emission Connectors	By Jul 1, 2013		
Low Emission FLLG*			
Cargo Tanks	New 7/1/13 Following Tank Evacuation† 7/1/17		N/A
Owned or Leased Stationary Storage Tanks	New or Reserviced: 7/1/13 In Field Retrofit‡: 7/1/15 Other Retrofit‡: 7/1/17		N/A
Portable Tanks	By Jul 1, 2017		
Vapor Recovery or Equalization System Maintain System: - Liquid and Vapor Tight During Transfer - Maintain Transfer Hose Assembly in Accordance with Vendor Specifications	Beginning January 1, 2013	N/A	
Daily Inspection for Leaks	Upon Rule Adoption		N/A
Quarterly Inspection for Leaks	Beginning January 1, 2013		N/A
Recordkeeping			
- Low Emission FLLG Installations - LPG Low Emission Connector Installations	By Jan 1, 2013		
- Leak Repairs	Effective Jan 1, 2013		N/A
- Vapor Recovery or Equalization System Maintenance Records	By Jan 1, 2013	N/A	
Reporting (Annual)			
- LPG Purchase and Dispensing Month-to-Month	By Jul 1, 2014, 2015, 2016§		N/A
- Inventory of LPG Containers and Associated FLLGs	By Jul 1, 2014, 2015, 2016, 2017, 2018	N/A	N/A
- End of Year Inventory of LPG Low Emission Connectors and Associated Equipment	By Jul 1, 2014	N/A	N/A

* Alternatively, an owner/operator may transfer or dispense LPG with the FLLG closed during transfer using a fill by weight technique or alternative technique or technology that monitors the maximum fill level to prevent overfilling without use of the FLLG.

† Effective July 1, 2013 cargo tanks shall be retrofitted exclusively with low emission FLLGs following any service that requires evacuation, but no later than July 1, 2017.

‡ Tanks that cannot be retrofitted without relocation shall be retrofitted after it is taken out of service, prior to being returned to service, but no later than July 1, 2017.

§ LPG transfer and dispensing facilities that offer LPG for sale to an end user may satisfy the reporting requirement by arranging to have their LPG suppliers identify and include their facility's LPG purchases with the supplier's annual report. The supplier shall also notify the facility and the District by March 1 of the reporting year in order to satisfy the reporting requirement.

The estimated emission reduction is 6.1 tons per day of fugitive VOC emissions upon full implementation. PR 1177 will partially implement Control Measure CM #2007 MCS-07 – Application of All Feasible Measures from the 2007 Air Quality Management Plan (AQMP).

Currently, only a subset of the LPG transfer and dispensing industry is being evaluated for VOC emissions reductions and controls in this proposed rule. Staff will continue to study other industry processes and potential control technology, and may

pursue future amendments in an effort to procure greater emission reductions from this source category, including a review of exempted and out of scope operations and contributions from leak detection and repair.

Pursuant to California Environmental Quality Act (CEQA) Guidelines §15252 and §15162 and AQMD Rule 110, the AQMD has prepared an Environmental Assessment (EA) for Proposed Rule 1177. The environmental analysis in the Draft EA concluded that Proposed Rule 1177 would not generate any significant adverse environmental impacts. The Draft EA was released for a 30-day public review and comment period from April 3, 2012 to May 2, 2012. Any comments received during the public comment period on the analysis presented in the Draft EA will be responded to and included in the Final EA. Prior to making a decision on the proposed adoption of Rule 1177, the SCAQMD Governing Board must review and certify the Final EA as providing adequate information on the potential adverse environmental impacts of the proposed project.

Staff has prepared a separate report on socioeconomic analysis with a summary of the overall cost-effectiveness of PR 1177 and that report is available to the public at least 30 days prior to the public hearing.

BACKGROUND

In May 1992, the California Air Resources Board (CARB) conducted a study to determine the usage patterns of LPG and to estimate emissions resulting from the transfer operations for the entire state of California. This effort was the first attempt to quantify LPG transfer emissions in California and the study found that total emissions were estimated to be 1,131 tons per year (3.11 tons per day) or the equivalent of 464,000 gallons of LPG emitted as fugitive VOCs annually. These emissions were based on 722 million gallons of LPG transferred in California and relied upon data provided by the National Propane Gas Association (NPGA). The report also concluded that emissions from the FLLG emissions were just as significant as emissions from filling line disconnections.

Starting in 2005, the Propane Education and Research Council (PERC), a non-profit organization created to enhance consumer and employee safety and also to provide research and development for clean and efficient propane utilization equipment, initiated a rebate program, subsidizing 75 percent of the cost of retrofitting LPG transfer and dispensing equipment with LPG low emission connector and “bleeder” valve (FLLG) technology. Based on data presented by the Western Propane Gas Association (WPGA), the program has funded approximately $500,000 to date. These funds have been used to complete the retrofit of an estimated 25 percent of the inventory of LPG low emission connectors and “bleeder” valves within the District that are eligible to be retrofitted. In order to qualify for the PERC rebate program, an owner/operator is required to retrofit an existing connector with one that meets the maximum design limit of four cubic centimeter (4 cc) emission release upon disconnection. However, in a few cases, although the design limit may exceed the 4

cc limit, the emission reduction benefit was considered significant enough to warrant consideration. Based on 2010 and 2011 PERC data for LPG low emission technology retrofits that have been completed, there are a few cases where connectors have achieved VOC reductions of greater than 95 percent, although the release amounts are as much as 24.9 cc per disconnection.

In 2006, under CARB's Innovative Clean Air Technologies (ICAT) grant program, the Adept Group Inc. evaluated and recommended methods to reduce fugitive VOC emissions from FLLGs during LPG tank filling operations. The Adept Group is a consulting company based in Westwood, California that provides services, including commercialization of technologies as well as engineering and technology advisory. In the past, The Adept Group received PERC grants for a subsonic Continuous Level Gauge (CLG) development for horizontal LPG storage tanks and an acoustic Stop-Fill Instrument (SFI) for Liquefied Propane Gas tanks. Both of these technologies were designed to non-invasively facilitate the filling of LPG containers with the FLLG valve closed, thereby limiting the amount of LPG vented to atmosphere. Based on most recent information obtained from the Adept Group, there are now over 100 tanks (predominantly bulk tanks 1,000 gallons and greater) in both Europe and the United States that are monitored with CLGs. Although the only SFIs that have been sold have been through a project with the Texas Railroad Commission, the product is now commercially available.

The District rule development process was initiated in August 2010 and has consisted of meetings with industry, including the WPGA and its membership. There have been a total of seven working group meetings and 13 field visits to bulk loading and dispensing facilities. Staff has had numerous telephone and electronic mail communications with CARB, the National Fire Protection Association (NFPA) and local fire agencies to fully evaluate the LPG transfer and dispensing process, as well as existing applicable local and federal fire code requirements and practices. There have also been direct (teleconference) communications with FLLG and LPG low emission connector manufacturers, including Marshall Excelsior and RegO Products.

In June 2011, a report authored by Life Cycle Associates, LLC, and prepared for WPGA, estimated the quantity of LPG fugitive emissions in California by examining the distribution chain of LPG, the associated activities and the potential VOC fugitive emissions events at each stage of the distribution process. LPG quantities transferred and dispensed as well as the emissions resulting from these processes were prorated for the District based on population data in the absence of region-specific data. The report also included potential strategies for VOC reductions, including the use of LPG low emission connectors and smaller orifice FLLGs or "bleeder" valves.

Introduction

LPG is a petroleum product composed predominantly of any of the following hydrocarbons or mixtures thereof: propane, propylene, butanes (normal or isobutane) and to a lesser extent butylenes, and is classified as a VOC. Although consisting

mainly of propane and butane, in some parts of the country, propane itself is commonly referred to as LPG. Unlike gasoline, which is a liquid under normal or standard conditions, LPG is a vapor under similar conditions, and must be stored and transported in closed containers under pressure to retain its liquefied state and may also be refrigerated to reduce the pressure at which it is stored.

LPG is colorless and odorless and about 1.5 times as heavy as air in the vapor state. Therefore, it is generally necessary, as a fire and safety precaution, to warn users of its presence in the event of leaks. Organosulfur compounds are usually used for this purpose with the most common odorant being ethyl mercaptan. Most states require a minimum of 1 pound of odorant to be injected into 10,000 gallons of LPG loaded. Appendix A – LPG Industry Summary contains additional details on LPG properties, transfer methods and uses.

Table 2 below indicates the LPG consumption categories and the specific uses in each NPGA identified category.

Table 2. NPGA LPG Sales Categories

Category	Description
Residential	Private homes (heating and cooking), recreational vehicles
Commercial	Motels (space heating and cooking), restaurants (space heating & cooking), laundries
Chemical	Raw material for chemical processing industry
I.C.E. Fuel	Highway vehicles, forklifts, oil field drilling production equipment
Agricultural	Tractor fuel, irrigation equipment engine fuel, building space heating, cooking, crop drying, tobacco curing and flame cultivation
Sales to Retail	Cylinder filling and exchange
Industrial	Standby fuel for manufacturing plants, space heating, flame cutting, metallurgical furnaces

LPG Transfer and Dispensing

When material is transferred from storage containers, it is done under normal atmospheric conditions, but typically at operating pressures which are higher than atmospheric through the use of pumps or vapor compressors in a closed system. In order for the material to remain in its liquid state when transferred, it is important that delivery occurs within a closed system where pressure is not compromised. Another important reason for maintaining a closed system under compression is because LPG is sold as a liquid and therefore metered and typically paid for on a per volume basis. Maintaining a closed system ensures that the customer is paying for product that is actually transferred rather than paying for lost product - a requirement of the Bureau of Weights and Measures.

The main value of LPG products lies in the fact that they can be stored in a liquid state and used in their gaseous state. The advantage obtained from reduced transportation cost is sufficient to offset the cost of liquefying and maintaining these products in a liquid state. Also, in order to use LPG in most commercial and industrial applications, it must eventually be converted back to a gaseous state which can be accomplished by returning it to atmospheric conditions.

Based on discussions with the working group and LPG operators and also through field observations, product transfer practices seem to vary relative to the period of time the FLLG is left open. Currently, NFPA 58; 7.3.1 (3) indicates that the venting of LPG gas, where necessary, shall be permitted by the use of FLLGs or bleeder valves. As such, per event activities are significantly different depending on the operator. Staff research indicates that NFPA 58 requires that the FLLG be used during LPG transfers mainly to address fire and safety concerns associated with overfills and possible release of large quantities of LPG. However, NFPA 58 does not specify the degree of opening the FLLG, which may also contribute to the different practices and hence the varying rates of fugitive LPG emissions.

LPG Fugitive Emissions

From the point of LPG production either from natural gas processing or crude oil refining to where the product reaches the end user, LPG is bought, sold, transported or distributed by wholesalers and refiners, retail bulk plants and other functions as detailed in Appendix A - LPG Industry Summary. During transfer of LPG there are fugitive emissions associated with each exchange.

LPG fugitive emissions from transfer and dispensing operations result from three main areas: volatilization of entrapped product during disconnection of LPG supply and transfer lines, leaks in the equipment used for transfer and dispensing, and venting through FLLGs used as a safety device to ensure that pressurized receiving containers, including cylinders and tanks are not overfilled.

The FLLG is attached to a dip tube that extends into the LPG storage container and is usually found on bobtail truck tanks, stationary storage tanks, and portable storage tanks and cylinders. The tube is inserted to be at the maximum level to which a receiving tank is to be filled and this level is typically set to 80 percent of the tank's capacity with the remainder of the container left as vapor space to account for impacts of fluctuating temperature. The connection outside of the tank serves as a bleed valve. When the valve is opened during filling, LPG vapor is pushed through the FLLG and when the desired volume is reached, liquid LPG is ejected, thereby providing the operator with a visual indication that the tank has reached its capacity and filling is complete.

LPG Fire and Safety Considerations

Although transfer and dispensing of LPG has been relatively unregulated from an air quality perspective, proper handling and storage is subject to regulation under both

the Department of Transportation (DOT) and the California Occupational Safety and Health Administration (Cal OSHA) as a hazardous material due to LPG's flammability. Moreover, because LPG is a saleable product, there is an inherent incentive to maintain closed storage, transfer and dispensing systems, which also serves to reduce fire and safety risks. A comparison of the DOT and Cal OSHA requirements to PR 1177 is included subsequently in the Comparative Analysis section of this report.

Affected Industry

The facilities and operations affected by PR 1177 are mainly represented by two Standard Industrial Classification (SIC) codes, 5984 - LPG (Bottled Gas) Dealers [North American Industry Classification System (NAICS) 454312] and 4925 - Mixed, Manufactured, or LPG Production and/or Distribution (no NAICS equivalent). However, processes not represented by either SIC code, but which include the transfer or dispensing of LPG will be evaluated on an individual basis to determine rule applicability.

Sales Distribution

Figure 1 below indicates the distribution of LPG sales in California according to market sector. The residential sector consumes approximately 40 percent of the total LPG sales in California followed by the chemical sector which uses approximately 20 percent. The distribution in the District, in the absence of region specific data, is presumed to be similar to the statewide distribution.

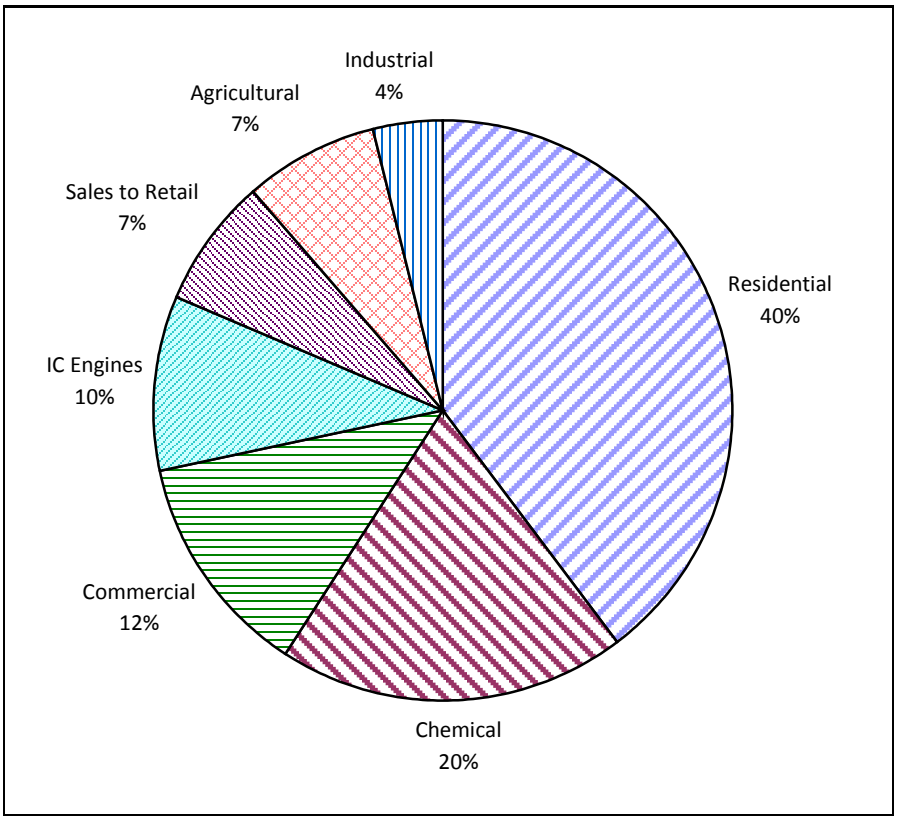

Figure1. California 2009 LPG Sales Distribution

EMISSION CONTROL TECHNOLOGY ASSESSMENT

This section summarizes control techniques for reducing fugitive VOC emissions from LPG transfer and dispensing activities. In addition to a Leak Detection and Repair (LDAR) program for low emission connectors, PR 1177 requires facility operators to: 1) replace existing FLLG valves with a smaller orifice (0.025 inch) No. 72 fixed liquid level gauge that reduces fugitive LPG vapors or use an alternative technique or technology that does not require the FLLG to be opened during filling, and 2) install LPG low emission connectors that result in reduced emissions upon disconnection.

Fixed Liquid Level Gauge (FLLG)

The FLLG, also referred to as the "bleeder" valve, is used as an indicator to determine the level of LPG in a tank. The valve is connected to what is called the dip tube which extends into the container. The dip tube is fixed and is typically set at a length equal to 80 percent liquid level tank capacity and filling level is dependent upon external conditions that would affect the expansion of LPG in the tank vapor space. The bleeder valve is designed so that during the filling process, when the LPG entering the tank reaches approximately the 80 percent mark, liquid will flow out of the opened valve as a visible mist. This lets the delivery operator know that the tank has reached its maximum filling capacity.

Currently, No. 54 orifice drill size is used on most tanks and cylinders, although some tank owners have already retrofitted tanks with a smaller No. 72 orifice drill size, which results in a reduced amount of LPG emitted during the filling process. There are several companies that already manufacture and distribute these smaller orifice FLLGs. Staff's research of FLLG manufacturers has determined that, although the No. 72 orifice drill size valve may not yet be available in commercial quantities for barbecue cylinders, they are available for storage tanks, forklift cylinders and cargo tanks. One manufacturer has indicated that the low emission FLLG is available in both brass and stainless steel for bobtail applications. Manufacturers further indicated that the lead time for bringing low emission FLLGs for barbecue cylinder applications to market is expected to range from a few weeks to a few months. They also anticipate little difficulty in meeting the expected demand that would result from the timelines established for compliance with the proposed rule.

LPG Low Emission Connectors

LPG low emission connectors are designed for various applications within the LPG transfer and dispensing industry. These products are designed to minimize the volume enclosed between two connection points, which limits the release of entrapped liquid upon disconnection. Relative to these specific applications, there is a manufacturer's claim of up to a [(6)]99.6% reduction in fugitive emissions compared to standard connectors in use today and a minimum savings of $350 per 1,000 transfers. Other low emission connectors are used for the dispensing of LPG into cylinders as well.

PERC Rebate Program

FLLG component cost is usually less than $10 each, whereas LPG low emission connector equipment cost can range from less than $20 to as much as $2,250 for a loading arm system for a bobtail or tanker/transport truck. Based on information provided by WPGA, some LPG marketers have already retrofitted some tanks, cylinders, bobtails, tanker/transport trucks and lines that facilitate the transfer of LPG in the District with these LPG low emission connectors and FLLGs. There are numerous companies that manufacture and distribute FLLGs and low emission connectors. LPG marketers have had the costs of retrofits subsidized through a rebate program that is sponsored by the Western Propane Education and Research Council (WPERC). The program provides a 75 percent rebate on new LPG connectors and FLLGs on a first-come, first-serve basis and to date the WPGA has claimed that 25 percent of existing inventory of LPG low emission connectors have been retrofitted as a result of the rebate program.

SUMMARY OF PROPOSED RULE 1177

Purpose

PR 1177 will reduce fugitive VOC emissions from the transfer and dispensing of LPG. The processes contributing to these emissions include delivery to residential, industrial and commercial users, fueling stations and cylinder refueling.

Applicability

This rule applies to the transfer of LPG from any cargo tank, stationary storage tank or cylinder into another cargo tank, stationary storage tank, cylinder or portable storage tank.

Definitions

Key definitions are listed in the proposed rule for clarity, and utilize standard industry terms wherever applicable. The proposed definitions incorporate extensive feedback from the LPG industry.

Equipment and Operation Requirements

Effective July 1, 2013, PR 1177 will allow dispensing of LPG via liquid and vapor tight LPG low emission connectors or dispensers, and allow venting only through a low emission FLLG in accordance with a prescribed FLLG retrofit schedule, as further described below. In lieu of venting through a low emission FLLG during transfer or dispensing, the owner/operator may elect to use a filling technique or technology that monitors the maximum fill level to prevent overfilling without use of the FLLG. An LPG low emission connector is designed to result in a maximum emission release of four cubic centimeters of LPG when disconnected, and a low emission FLLG is a fixed liquid level gauge with a number 72 orifice size (0.025 inch) or physical configuration that results in an equivalent or lower emission rate that is tested and demonstrated using a method for which written approval of the Executive Officer has been obtained.

PR 1177 will also require operators of railroad tank cars and transport trucks with vapor recovery or equalization systems to properly maintain and operate these systems according to manufacturer's specifications. The vapor return lines and liquid lines, including the hose, fittings and gaskets which facilitate the movement of LPG must be properly connected between the cargo tank and the stationary storage tank and must also be maintained to ensure that the system remains liquid tight and vapor tight during the transfer process.

Effective July 1, 2013, the owner/operator of a facility that transfers and dispenses LPG to stationary storage tanks, will be required to meet one of the following two conditions when transferring LPG. First, the owner/operator may choose to facilitate the LPG transfer with the FLLG in a closed position, while achieving the maximum

fill level without overfilling the tank. Secondly, for an owner/operator that chooses to use the FLLG during filling, any newly installed stationary storage tank or one that is out of service or taken out of service must be equipped with a low emission FLLG prior to being put into or returned to service. In cases where a storage tank cannot be retrofitted with a low emission FLLG without relocation for evacuation or other services, the operator has until July 1, 2015 to demonstrate through documentation that the tank falls into this category. Stationary storage tanks for which such documentation is established must be retrofitted with a low emission FLLG by July 1, 2017 prior to being filled.

Effective July 1, 2017 any transfer of LPG into a portable storage tank or cylinder will be required to be done only when the portable storage tank or cylinder is equipped with a low emission FLLG or when applying a fill by weight technique or technology that monitors the maximum fill level to prevent overfilling with the FLLG closed.

Operator Leak Detection Program Requirements

In addition to retrofit of LPG low emission connectors and low emission FLLGs, to prevent potential emissions, the proposed rule will require the implementation of a Leak Detection and Repair (LDAR) program for LPG transfer and dispensing facilities that offer LPG for sale to end users. Based on feedback from the LPG industry, there are minimal leaks from existing systems, but staff believes that implementing a minimum level of due diligence through monitoring and repair can provide additional air quality benefits. The reduction of LPG emitted to the atmosphere also benefits the LPG industry by reducing product loss that leads to enhanced safety which may result in lower insurance costs.

Effective January 1, 2013, the LDAR program will include daily physical checks for evidence of leaks. Owner/operators will be required to conduct inspections of connectors involved in the transfer of LPG to stationary storage tanks that are owned or leased or to cargo tanks that are used to supply LPG to any other stationary storage tank or cargo tank. These inspections call for a bubble test to be conducted once every 90 days or in the case where the time between transfers is greater than 90 days, an inspection is required to be conducted upon the completion of the subsequent transfer operation. It should be noted that the proposed daily checks and the quarterly inspections requirement do not apply to portable storage tanks.

For any equipment or connector that is found to be leaking, PR 1177 will require the operator to remove the equipment or connector from service, complete the repair and verify that the repair was completed by use of a bubble test or survey using an analyzer or test method used for detecting LPG vapor leaks. The operator will also be required to record any defect and repair activity prior to placing the equipment or connector back into service. Leaks and defects that are discovered during daily checks and inspections and repaired prior to placing the equipment or connector back into service would not constitute a violation of the PR 1177 vapor tight or liquid tight

standards. However, leaks found by District staff may result in violation of these rule provisions.

The proposed rule will also require owners to implement a training program for any employee that is responsible for conducting daily physical checks for evidence of leaks, such as the presence of odor, hissing noises, or staining, as well as quarterly inspections. The training program will also be required to include written training procedures, the training frequency and schedule training dates and a written record of the training dates provided for each employee. Based on discussions with the LPG industry, similar training is already conducted for all affected employees.

Recordkeeping Requirements

PR 1177 requires for persons performing the installation of low emission FLLGs and LPG low emission connectors, inspections or repairs at any LPG transfer and dispensing facility or at a bulk loading facility to provide the owner/operator with the following information after service is completed: 1) records of all low emission FLLGs and LPG low emission connectors installed; 2) service or sales receipts; 3) repair logs that include the date and time of each repair and a description of the service performed; 4) employer information such as name, address and phone number; and 5) some form of identification feature of the low emission FLLG or LPG low emission connector repaired, serviced or removed, including the manufacturer name. The owner/operator is subsequently required by PR 1177 to maintain these records for a minimum of two years.

For railroad tank cars or tanker/transport trucks that have an LPG vapor recovery or equalization system, PR 1177 will require the owner/operator to maintain records which demonstrate that the system is maintained and operated according to the specifications of the vapor recovery and equalization system manufacturer.

Reporting Requirements

PR 1177 requires owners/operators of LPG bulk loading facilities or LPG transfer and dispensing facilities that offer LPG for sale to an end user to submit monthly purchase and dispensing (sales) volumes as part of an annual report for calendar years 2013, 2014 and 2015, respectively. These reports must be submitted no later than July 1 of 2014, 2015, and 2016, respectively. This data will assist staff in collecting and tracking LPG activity within the basin in order to assess any seasonal fluctuations in consumption and to improve upon staff emission estimates. It is expected that month-to-month variability may be present in facility records

LPG transfer and dispensing facilities that offer LPG for sale to an end user may meet the annual reporting requirement for LPG purchase and sales volumes through an arrangement with their LPG suppliers, provided all suppliers notify the facility and the District by March 1 of the reporting year and include the name of the facility as part of the supplier's annual report.

The owner/operator of an LPG bulk loading facility will also be required to submit an end of year inventory of their facility's LPG low emission connectors for calendar year 2013 by no later than July 1, 2014. The inventory must identify the equipment to which the LPG low emission connector is associated (e.g. bobtail, stationary storage tank, etc.) and must also include the LPG low emission connector manufacturer name and the part or identification number.

The owner/operator of an LPG bulk loading facility will also be required to submit an end of year inventory of all leased or owned containers and FLLGs associated with LPG storage or transfer for calendar years 2013 through 2017. The inventory must identify containers by type (residential tank, commercial tank, portable forklift cylinder, bobtail, transport truck, etc.) and size (storage capacity in gallons) and must include the total number of owned or leased containers in each type and size category. In addition, the inventory must include the total number of FLLGs, as well as the number of low emission FLLGs installed in each container size category. The submittal schedules will be July 1, 2014, 2015, 2016, 2017 and 2018, respectively for each previous calendar year 2013, 2014, 2015, 2016 and 2017, respectively.

Appendix C - Recordkeeping and Reporting Sample Forms contains sample reporting and recordkeeping forms for PR 1177.

Leak Detection Method

PR 1177 requires that leaks be determined through the use of a bubble test method or a survey that employs the use of an appropriate analyzer or another test method. Leak concentration measurements may also be conducted using EPA Reference Method 21 using an appropriate analyzer that must be calibrated with methane before an inspection is conducted. For the purposes of this rule any measurement of 10,000 ppm or less would be considered a vapor-tight.

Confidentiality

Purchase and dispensed volume information submitted to the District may be designated as exempt from disclosure and the owner/operator must clearly indicate this on any information or data for which the exempt from disclosure designation is sought. Appendix C - Recordkeeping and Reporting Sample Forms provides example report forms that can be used to identify how the exempt from disclosure designation can be designated.

Exemption

The proposed rule provides an exemption for LPG transfer into any container that has a water capacity of less than four gallons. There is also has an exemption for facilities that are subject to the requirements of Rule 1173 – Control of VOC Leaks and Releases from Components at Petroleum Facilities and Chemical Plants.

Owner/operators that fill LPG cylinders that are specifically dedicated and installed in recreational vehicles are also exempt from the FLLG retrofit requirements of the rule.

EMISSION INVENTORY

The emissions inventory is comprised of fugitive VOC emissions released from the LPG transfer and dispensing operations within the District. The estimated fugitive emissions are categorized by the following actions:

- Disconnection of liquid line
- Disconnection of vapor line
- Disconnection of the "jump line" that is used to connect truck and trailer cargo tanks.
- Vapor released from the FLLG
- Liquid released from the FLLG

It should be noted that emissions from leaks are currently not quantifiable based on available data. However, the owner/operator of LPG bulk loading facilities and LPG transfer and dispensing facilities will be required to maintain records or logs of leaks that are identified and subsequently repaired.

EMISSIONS ESTIMATION METHODOLOGY

The proposed rule will address fugitive emissions released from each transfer as detailed in Appendix A – LPG Industry Summary. Appendix B – Emission Inventory Calculations contains details on the emissions estimation methodology and calculations, which estimate the level of transfer and dispensing related activities based on annual sales volumes.

Liquefied Petroleum Gas (LPG) Sales

LPG sales data for the state of California is voluntarily submitted by businesses involved in the transfer and dispensing of LPG to the American Petroleum Institute (API). Therefore, the data shown in Table 3 below represents only a rough estimate of LPG sales for California.

Historical API sales data combined residential and commercial sales until 2002, but as of 2003 sales data for these two categories were reported separately. Table 3 below shows California LPG sales data from 1999 to 2009. Figure 2 provides the most recently available California sales data (2009) by distribution category.

Due to the lack of region-specific LPG sales data for the District, a proportionality factor of 0.455, based on the District's population compared to total California state population, was used to estimate the sales data for the four-county region~~,~~; forklift LPG consumption was estimated using CARB EMFAC and off-road vehicle inventories.~~and is reflected in Figure 2 which provides sales data by distribution~~

~~category. The 2009 API sales data represents the most recent information and therefore is used to estimate baseline emissions.~~

Table 3. Historical California LPG Sales (mgal), API sales data provided by Western Propane Gas Association

Category	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Residential and Commercial	302,715	288,766	199,223	240,791							
Residential	-------	-------	-------	-------	204,167	246,420	252,807	259,285	287,581	283,711	275,256
Commercial	-------	-------	-------	-------	109,912	146,220	104,266	88,015	101,518	108,513	86,639
Sales to Retailers	N/A	N/A	N/A	N/A	64,663	61,665	65,854	56,938	56,905	65,358	51,941
ICE Fuel	44,297	66,678	80,660	64,717	53,829	62,773	73,137	73,498	with-held	with-held	67,077
Chemical	89,212	180,861	135,075	N/A	N/A	N/A	N/A	N/A	N/A	N/A	135,576
Industrial	37,950	36,791	37,813	45,300	33,331	22,994	44,788	46,512	with-held	with-held	27,806
Agricultural	25,421	17,255	39,874	65,056	30,373	49,588	55,509	66,216	74,321	59,409	50,466
Total CA Sales	**499,415**	**590,361**	**492,644**	**415,864**	**496,276**	**589,480**	**573,904**	**590,464**	**651,139**	**633,053**	**694,761**
SCAQMD Sales *	**227,234**	**268,614**	**224,153**	**189,136**	**225,806**	**268,259**	**261,126**	**268,661**	**296,268**	**288,039**	**316,116**

(*) South Coast Air Basin sales is estimated at 45.5 percent of California sales based on population

Although sales in California fluctuated during this period of time, there has been an overall increase in LPG sales of approximately 40 percent with LPG sales increasing from approximately 500 million gallons in 1999 to almost 695 million gallons in 2009.

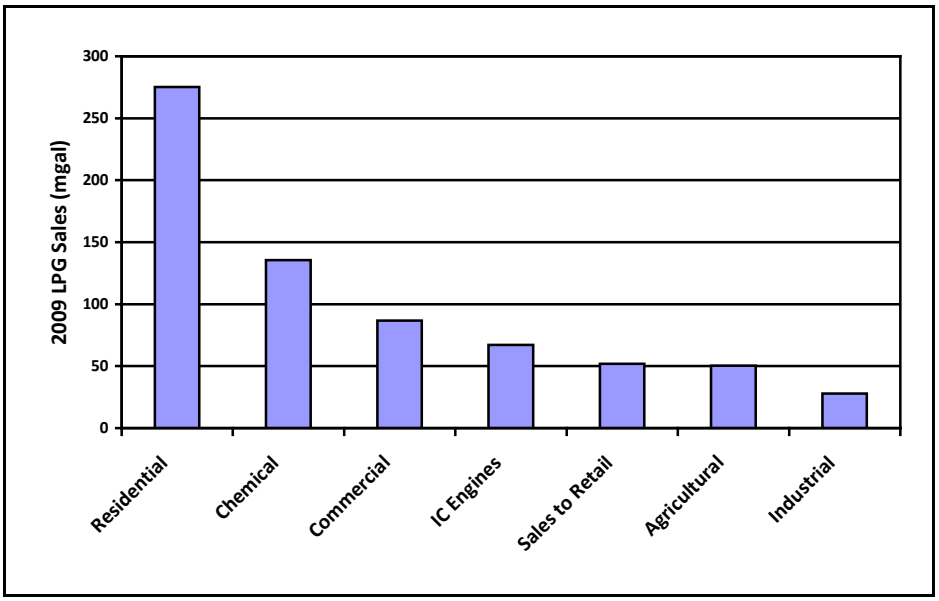

Figure 2. California 2009 LPG Sales Distribution

LPG Emission Factor Determination

In November 2008, the District conducted VOC testing at the Mutual Propane facility in Gardena, California. Thirty-three (33) pound LPG (propane) forklift storage tanks were filled using the gravity filling method with the objective of the test being to determine the rate at which propane is lost to the atmosphere during the filling process. The results obtained from the District tests were compared with the results obtained by the Adept Group which conducted their testing separately, but on the same day as the District. The tanks in both the District and the Adept Group tests were equipped with a No. 54 gauge (0.055-inch orifice) FLLG. The results of both sets of testing are summarized in Table 4.

Table 4. LPG Test Data

Transfer Activity	Test Reference	Gaseous Propane Emissions Rate (g/s)	Liquid Propane Emissions Rate (g/s)
Gravity Fill *	SCAQMD (2008)	2.26	8.94
	Adept Group (2008)	2.5	N/A
Pressure Fill (or Fill by Volume) *	SCAQMD (2011)	2.01	11.3
	Adept Group (2008)	3.0	10.9

* Refer to page A-~~14~~ 13 of Appendix A – LPG Industry Summary for gravity fill and fill by volume method discussions

In addition to the District and the Adept Group's testing, Battelle Laboratories had conducted source testing in September 2009 to compare the fluid flow rate through a No. 54 orifice drill size FLLG and a No. 72 orifice drill size (0.025 inch) FLLG, and

to evaluate the smaller gauge size to determine if there exists a susceptibility to blocked flow from potential particle obstruction or freeze-up. The Battelle source test was evaluated by District source testing staff and found to be conditionally acceptable. In an effort to further verify the emission rates of a No. 54 gauge and No. 72 gauge FLLG, District engineers conducted additional analysis in the fall of 2011, and issued a final report in December 2011, focusing on pressure filling. Blockage or freeze-up has not been observed in any testing to date. Emission rates and potential emission reductions in this staff report are based on the 2011 final report results listed in Table 4 (see additional details in Appendix B – Emission Inventory Calculations).

Emission Reductions

Table 5 below lists the emissions associated with each market sector and also the reductions resulting from the use of control technology. The current estimated emissions inventory from the transfer of LPG is 8.6 tons per day (tpd). In contrast, the WPGA estimated daily VOC emissions of 2.1 tpd. Lastly, based on the Adept Group's estimates, the daily VOC emissions inventory may be as high as 68 tpd.

It is also important to note that filling tanks by weight or through the use of alternative techniques or technologies would not require the FLLG to be open, thus completely eliminating emissions from FLLGs. However, because the rule provides an option to the LPG industry on the use of low emission FLLGs or an alternative approach, the emission reductions represented in this staff report, which are based on emissions from the low emission FLLG, are conservative because shifting to alternative techniques or technologies is not considered in the calculation.

Based on discussions with industry and observations in the field, there appears to be a significant difference in the practice of venting LPG from the receiving tank's FLLG during transfer. In some cases the FLLG is left open for approximately one minute, while in other cases the FLLG is left open for as long as the entire duration of the filling process, which can vary between a few minutes for a 5 gallon container to over half an hour for a bobtail truck tank or large residential or commercial storage tank.

Table 5 summarizes emissions and potential emission reductions data collected by the WPGA, as well as estimates based on staff research, including feedback provided by stakeholders during the working group meetings, and during site visits conducted by staff. Additional details are provided in Appendix B – Emission Inventory Calculations.

Table 5. SCAQMD VOC Emissions Reductions (tons per day)

Sector	WPGA Criteria		District Criteria*	
	Emissions (tons/day)	Reductions (tons/day)	Emissions (tons/day)	Reductions (tons/day)
Residential	0.17	0.10	1.47	0.79
Commercial	0.05	0.03	0.47	0.25
Sales to Retail (Cylinder Filling and Exchange)	1.18	0.38	2.03	1.31
IC Engines (Forklifts)	0.63	0.55	4.35†	3.62†
Industrial, Chemical, Agricultural	0.02	0.02	0.18	0.10
Distribution Facilities	0.05	0.04	0.07	0.07
Total:	**2.1**	**1.1**	**8.6**	**6.1**
			68 ‡	

* Primarily differences include variation of FLLG use from 60-90 seconds up to 100% of LPG transfer time, and difference between industry referenced emission rate of 0.8 g/s compared to recent SCAQMD tested result of 2.01 g/s. Worse case criteria do not adjust WPGA assumed market distribution of fill by weight transfers.

† Initial WPGA criteria does not account for forklift tank gravity fill activities. A significant increase in estimated fugitive LPG emissions and subsequent reductions within the IC Engine sector is due primarily to the extended filling and concurrent venting time associated with gravity filling.

‡ Adept Group Estimate, 2009.

PR 1177 will reduce the overall VOC emissions by 6.1 tpd based on results obtained from the District staff's FLLG source test report and the control efficiency requirements for LPG low emissions connectors. Additionally, reports by Battelle, Life Cycle Associates, CARB, and WPGA provide further support to verify control efficiencies of the low emission FLLGs and LPG low emission connectors.

It should be noted that while the residential sector represents roughly 40 percent of the sales volume, the largest contributors to the estimated baseline emissions are represented by sales to retail (primarily smaller five gallon barbecue cylinders) due to the greater frequency of filling, the accompanying disconnections from such transfers, and to the practice of gravity filling for forklift cylinders (internal combustion engines), due to the extended filling times (roughly seven minutes compared to less than a minute for pump-assisted filling) and concurrent venting through an open FLLG.

COST AND COST-EFFECTIVENESS

This section presents the cost and cost-effectiveness associated with the PR 1177, including underlying evaluation assumptions.

In order to calculate the cost-effectiveness for implementing PR 1177, the net present value of the capital cost and operating cost of any requirements can be calculated using the following formula:

PV = C + A x PVF, where:
PV = Present Value of the control equipment
C = Capital costs associated with implementing PR 1177
A = Annual costs incurred to administer the retrofit program, such as inspection and component repair
PVF = Present Value Factor, which is 8.11 for an assumed 10 years equipment life and 4% real rate of inflation.

Fugitive VOC emission reductions resulting from the implementation of PR 1177 are estimated at 6.1 tons per day (see Appendix B – Emission Inventory Calculations).

Capital and Installation Costs

The proposed rule requires owner/operators to transfer or dispense LPG only to containers that are either fitted with low emission FLLG or make use of an equivalent alternative technique or technology. The propose rule also requires use of LPG low emission connectors.

Based on data supplied by the WPGA, an estimate of the number of affected LPG containers and the cost of components were categorized by container type and expected equipment upgrade. The estimated costs ranged from as low as $2 for a self-cleaning, No. 72 orifice drill size FLLG to as much as $2,250 for the retrofit of a loading arm system for bobtail and transport trucks. Staff relied upon upper end cost estimates as a conservative approach to determine overall cost-effectiveness. For example, rather than rely on the cost to retrofit an existing barbecue cylinder with a low emission FLLG, the cost for a new cylinder (~$30) was used.

The total capital costs associated with PR 1177 is approximately $21 million. This cost is distributed among 3 major areas. These are 1) retrofit of stationary storage tanks and forklift cylinders with low emission No. 72 orifice drill size FLLGs; 2) retrofit of existing connectors with new LPG low emission connectors; and 3) upgrading existing facilities to decrease filling times associated with gravity filling (forklift cylinders) or to accommodate fill-by-weight (barbecue cylinders).

Residential and Commercial Tanks

PR 1177 will require that tanks that meet American Society of Mechanical Engineers (ASME) Code be retrofitted with low emission FLLGs. Of the total ASME tanks, the majority (or 39,712) of these tanks are found in the residential sector, while the remaining 5,643 are used in the commercial sector. The individual FLLG cost is $10, while the installation which is relatively straightforward can be completed by an LPG operator. For this report the installation cost is conservatively estimated at $50, or roughly an hour's worth of labor.

Forklift Cylinders

PR 1177 requires that cylinders and portable storage tanks be either filled using a fill by weight technique or an alternative technique or technology that monitors the maximum fill level without the use of an FLLG or retrofitting the container "bleeder" valve or FLLG with a low emission FLLG.

According to a data provided by the WPGA, approximately 70 percent of this market employs the fill by volume method using a pump and motor. For the remaining 30 percent of this market, forklift cylinders are filled by gravity. Based on feedback of the working group, the cylinders that are filled by volume will be retrofitted with low emission FLLGs that will have identical capital and installation costs as residential and commercial tanks.

Results obtained from field tests indicate that it would take an operator five to six times as long to gravity fill a 33-pound forklift cylinder with a No. 72 low emission FLLG compared to the same size cylinder fitted with a No. 54 orifice drill size FLLG. Based on these observations, it is expected that an operator will likely consider one or more of three possible options. These options are: 1) in situations where the stationary tanks used to fill the forklift tank range in capacity from "200 DOT" storage tank (or ~46 gallons) to 125 gallons, a customer is likely to opt for removing these stationary storage tanks and replacing them with new cylinders and rack(s) and have the LPG supplier fill them directly; 2) remove existing storage tanks that range in capacity from 172 gallons to 288 gallons and replace them with a larger tank (~ 500 gallons) equipped with a pump and motor to speed up the filling of the forklift cylinder by volume; and 3) for stationary tanks that range in capacity from 499 gallons to 1,150 gallons, to add a pump and motor. In each of these cases there will be product and time savings which have not been factored into the cost-effectiveness calculations.

Barbecue Cylinders

According to data provided by WPGA, the current 20 pound barbecue cylinder inventory is approximately 142,000. WPGA estimates that half of these cylinders are filled by weight at facilities equipped with automated (carousel) systems such as Blue Rhino and Amerigas and subsequently distributed as part of an exchange program to locations such as Home Depot, retail facilities and gasoline service stations. The remaining cylinders are filled by volume at gasoline service stations as well as at other retail facilities. It is estimated that there are approximately 3,300 facilities that currently provide barbecue cylinder filling as part of their services. Based on information from the Life Cycle Associates, LLC report, historically these cylinders have been refilled (by volume) at a local retailer, but cylinder exchange programs have become much more common in recent years.

Of the 3,300 facilities that offer the service of refilling barbecue cylinders, it is assumed for cost-effectiveness calculation purposes that a majority (~80 percent, or 2,640 facilities) will offer the option of continuing to fill by volume or exchange

empty barbecue cylinders for full ones. It is also assumed for calculation purposes that for the remaining facilities (~660) a fill by weight, on-site option that would require a scale and may also include an automatic shut-off valve installation would be considered. Table 6 summarizes the various capital and associated installation labor costs for each of the equipment replacement or retrofit upgrades expected to occur as part of PR 1177 implementation. A cross-reference to additional evaluation parameters are cross-referenced within the table.

Table 6. Summary of PR 1177 Capital and Installation Costs.

Retrofit Activity	No. of Units	Cost per Part	Total Cost of Parts	Labor Cost	Total Labor Cost	Total Retrofit Cost
FLLGs on Residential Tanks	39,712(1)	$10	$397,120	$50	$1,985,600	$2,382,720
FLLGs on Commercial Tanks	5,643(1)	$10	$56,430	$50	$282,150	$338,580
New Barbecue Cylinders (OPD Unit)	71,000(2)	$30	$2,130,000	$10	$710,000	$2,840,000
Scales to Allow for Fill by Weight Process	660	$1,000	$660,000	-----	------	$660,000
FLLGs on Bobtail Trucks	250	$10	$2,500	$50	$12,500	$15,000
Bobtail Trucks (Dispenser Vapor Tight Seals)	250	$370	$92,500	$200	$50,000	$142,500
LPG Low Emission Connectors on Tanker Trucks	100	$2,000	$200,000	$200	$20,000	$220,000
Forklift Tank FLLG Retrofits	60,000(1)	$10	$600,000	$50	$3,000,000	$3,600,000
Forklift Cylinders (**Gravity Fill**) Convert to Cylinder Exchange Option with Direct Fill [5]	2,038 Tanks (1,530 customers)	See footnote (5)	$3,204,400	$200	$407,600	$3,612,000
Trucks (for Cylinder Exchange Program)[5]	6	$120,000	$720,000	-------	------	$720,000
Forklift Cylinders (**Gravity Fill**) Convert to Fill by Volume Option[6]	415 customers (with 415 tanks)	$3,000	$1,245,000	$2,000	$830,000	$2,075,000
Forklift Cylinders (**Gravity Fill**) Replace Existing Tank with Larger Tank and Add Pump/Motor to Allow Fill by Volume Option[7]	196 tanks (196 customers)	$1,000 $3,000	$196,000 $588,000	$200 $2,000 $5,000	$39,200 $392,000 $980,000	$235,200 $980,000 $980,000
Service (Hose End) Dispensers	5,000	$400	$2,000,000	$100	$500,000	$2,500,000
		Total Cost:	**$12,091,950**		**$9,209,050**	**$21,301,000**

(1) Obtained from LPG Tank Inventory provided by Western Propane Gas Association (WPGA) (See Appendix A – LPG Industry Summary)

(2) Obtained from WPGA data provided. Industry estimates that 50 percent of barbecue tank inventory is included in the exchange program that employs the fill by weight process which is carried out with the "bleeder" valve closed

(3) Industry estimates that approximately 2,141 facilities (with 2,649 tanks) that fill by gravity could possibly change to any of three (3) alternative options which include fill by volume using a pump, a cylinder exchange program/direct bobtail fill of cylinders and where suitable replacing a smaller tank with a larger one and adding a pump and motor.

(4) Based on WPGA survey data

(5) Based on addition of 1 - 6 cylinder rack and 6 new cylinders to replace 200 DOT and 50 gallon tanks, and 1 -12 cylinder rack and 12 new cylinders to replace 420 DOT and 125 gallon tanks

(6) Based on addition of a pump/motor at $3,000 each and electrical for which labor cost is $2,000

(7) Tank replacement cost used is $1,000 with the associated labor cost being $200 per tank; $2,000 for wiring and $5,000 for engineering design, site preparation and permitting

Operation and Maintenance Costs

It is estimated that there are two hundred bulk loading facilities which will be responsible for inspections, recordkeeping and reporting data to the District. Employee training is already being implemented at LPG bulk loading facilities and therefore there will be minimal cost associated when the training requirements of PR 1177.

The LPG transfer and dispensing industry has expressed the importance of minimizing leaks that may occur in their operations since product loss is directly related to company profits. As such, a leak detection and repair program is already in place and therefore, PR 1177 will not add any cost associated with leaks at LPG bulk loading facilities or customer locations.

Annual operations and maintenance costs will be mainly due to the costs associated with inspections, reporting and recordkeeping.

Table 7. Summary of Operational, Maintenance and Administrative Costs.

Activity	No. of Facilities	Activity Frequency (or Period)	Unit Cost	Annual Cost	(P/A) Factor	(Annual Cost)x (P/A) Factor
Quarterly Inspections (>10,000 gal. tanks)	200 (4 per year)	Quarterly	$200	$160,000	8.11	$1,297,600
Reporting (1)	200	3 years	$2,000	$400,000	2.7751	$1,110,040
Recordkeeping (2)	200	Annually	$4,800	$960,000	8.11	$7,785,600
Truck Driver (3)	6	Annually	$70,000	$420,000	8.11	$3,406,2000
Tank Maintenance Employee (3)	6	Annually	$70,000	$420,000	8.11	$3,406,200
Truck Maintenance (3)	6	Annually	$5,000	$30,000	8.11	$243,300
					Total Cost:	**$17,248,940**

(1): Time dedicated to reporting is assumed to be one week per year (at $50 per hour)
(2): Time dedicated to recordkeeping is assumed to be 1 day per month (at $50 per hour)
(3): For forklift cylinder exchange program

Staff has reviewed in detail the emission reductions, assumptions, capital and installation costs and operational and maintenance costs with the WPGA and other members of the industry, reaching consensus on costs included in this staff report.

Overall Cost-Effectiveness

Based on a 10 year useful component life:

$$\frac{\text{Total Capital Cost} + (\text{Total Annual O \& M Cost} \times 8.11)}{\text{Total Annual Emissions reductions (tpy)} \times 10 \text{ years}}$$

$$= \frac{(\$21{,}301{,}000) + (\$17{,}248{,}940)}{6.1(\text{tpd}) \times 365 \times 10}$$

≈ $1,700/ton VOC reduced

INCREMENTAL COST EFFECTIVENESS

Health and Safety Code Section 40920.6 requires the AQMD to perform an incremental cost analysis when adopting a Best Available Retrofit Control Technology (BARCT) rule or feasible measure required by the California Clean Air Act. To perform this analysis, the AQMD must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the AQMD must "calculate the difference in the dollar costs divided by the difference in the emission reduction potential between each progressively more stringent potential control option as compared to the next less expensive control option."

Proposed Rule 1177 partially implements Control Measure MCS-07 from the 2007 Air Quality Management Plan. Because Control Measure MCS-07 is intended to meet feasible measure requirements under the California Clean Air Act, an incremental cost analysis is required and is presented below.

Staff evaluated several alternatives based on current operating practices, focusing on emission control options at the supply and receiving container for BBQ tanks/cylinders, while preserving the proposed control requirements for all other LPG transfer and dispensing applications. The first alternative was based on PR 1177, and requires the use of LPG low emission connectors, but not the low emission FLLG requirement. The additional control options included all PR 1177 requirements for barbecue tanks/cylinders as well as a final option that replaced the low emission FLLG requirement with a mandatory fill by weight requirement. The mandatory fill by weight requirement would eliminate the fugitive emissions from FLLG during the filling process.

Although the fill by weight alternative would result in additional emission reductions, the PR 1177 requirement to use a tank fitted with a low emission FLLG or equivalent alternative would still allow fill by weight as a compliance option, and require at most a one-time nominal cost for a newly fitted or retrofitted tank, whereas the mandated fill by weight alternative would require the installation and maintenance of a scale at each retail facility that supplies LPG for BBQ tank/cylinder customers.

The analysis indicates that the overall cost-effectiveness is reduced by the low incremental cost impact from the PR 1177 requirements associated with barbecue tank filling, whereas the more stringent fill by weight requirement for this category represents an order of magnitude higher impact, or approximately $2 million annual increase, as compared to the proposed rule.

Table 8 summarizes the total and incremental cost-effectiveness of each of the three alternatives analyzed.

Table 8. Comparison of Incremental VOC Reduction Alternatives and Costs

Control Alternative for BBQ Tank Filling	Incremental VOC Reduction (tpd)	Annual Cost Increase ($/year)	Incremental Annual Cost ($/year)	Incremental Cost-Effectiveness ($/ton)	Overall Cost-Effectiveness ($/ton)***
LPG Low Emission Connectors	0.0	$0	$0	$0	$2,000
PR 1177 Requirements: ▪ LPG Low Emission Connectors ▪ Low Emission FLLG*	1.2**	$213,000	$213,000	$500	$1,700
▪ LPG Low Emission Connectors ▪ Mandatory Fill By Weight	1.2	$2,003,100	$1,790,100	$4,200	$2,100

* PR 1177 requires use of a low emission FLLG, fill-by-weight or an alternative technique or technology that monitors the maximum fill level to prevent overfilling without use of the FLLG; fill by weight is considered an alternative technique. The lowest cost alternative is expected to be implemented by owner/operators as identified.

** District and industry sponsored source test data indicate a reduction range of 50% - 70%, the low end of the range is conservatively used for cost-effectiveness evaluation.

*** Overall cost-effectiveness includes the BBQ tank filling control requirements and the remaining control requirements of PR 1177.

COMPARATIVE ANALYSIS

Pursuant to Health and Safety Code, Section 40727.7 staff has prepared an analysis of the proposed AQMD rules and regulations, requirements and federal air pollution control measures that apply to the same source type. While there are no current federal or District air pollution control requirements for this source, there are requirements imposed by Cal OSHA and DOT, which staff has examined. Table 9 below summarizes this analysis.

Table 9. Proposed Rule 1177 Comparative Analysis

Section	AQMD	Cal OSHA*	DOT
Purpose	Reduce VOC emissions associated with transfer and dispensing of LPG [PR 1177 (a)]	Establishes minimum safety standards in places of employment [8 CCR 450, NFPA 58 by adoption]	Prescribes requirements applicable to the acceptance and transportation of hazardous materials by private, common, or contract carriers on highways [49 CFR 177.800]
Applicability	Transfer of LPG from a cargo tank, stationary tank or cylinder to other cargo, stationary or portable tank or cylinder [PR 1177(b)]	The design, construction, and installation of LPG containers, including the storage and handling of LPG [8 CCR 450(a)]	Transport of LPG by motor carriers on highway [49 CFR 177.800]
Requirements	• LPG transfer from cargo tank to stationary tank and vice versa at bulk loading facilities: o A rail tank or tanker truck equipped with vapor recovery or equalization lines must be maintained and operated according to manufacturer's specifications; o All vapor and liquid return lines must be in vapor and liquid tight condition; o The transfer hose assembly must be properly maintained. • LPG transfer and dispensing facilities: o Cargo tanks, stationary tanks and cylinders used to transfer or dispense LPG must be fitted with vapor tight LPG low emission connectors by 7/1/2013; o Cargo trucks and stationary storage tanks are equipped with low emission FLLG or use alternative technique or technology by 7/1/2017; o New or reserviced cargo tanks and stationary tanks shall be fitted with low emission FLLGs. o Portable tanks filled by volume must have a low emission FLLG by 7/1/2017 [PR 1177 (d)]	• LPG tanks used for storage, transport or mobile fuel tanks >125 gal require permit, renewable every 5 years • Permits to operate dispensing units, trap tanks, and skid tanks are renewable every 3 years • Tanks have to be re-inspected by an authorized inspector upon permit renewal • Permits are valid for a specific tank at a specific location. If the tank is replaced, the permit is invalid • LPG product has to be odorized • Tanks > 125 gal have to be equipped with level gages and thermometers • Air pressure cannot be used to displace LP-Gas during the transfer operation • All filling connections shall be kept effectively plugged or capped when not in use [8CCR 470-494]	Cargo tanks must be: • Seamless or welded construction or combination of both • Compliant with ASME Code Section VIII • Have a design pressure between 100 – 500 psig • Equipped with a pressure relief valve on top of the tank • Painted white, aluminum or similar reflecting color on the upper two-thirds of area of the cargo tank • The burst pressure of all piping, pipe fittings, hose and other pressure parts, except for pump seals and pressure relief devices, must be at least 4 times the design pressure of the cargo tank • Each cargo tank must be provided with a pressure gauge • The cargo tank motor vehicle manufacturer must supply a certificate stating that the completed cargo tank motor vehicle conforms in all respects to Specification MC 331 and the ASME Code • Before unloading from a cargo tank motor vehicle containing a liquefied compressed gas, the qualified person performing the function must check those components of the discharge system, including delivery hose assemblies and piping, that are readily observed during the normal course of unloading to assure that they are of sound quality, without obvious defects detectable through visual observation and audio awareness, and that connections are secure • If there is an unintentional release of product to the environment during unloading of a liquefied compressed gas, the qualified person unloading the cargo tank motor vehicle must promptly shut the internal self-closing stop valve or other primary means of closure and shut down all motive and auxiliary power equipment [49 CFR 177]

Section	AQMD	Cal OSHA*	DOT
Leak detection and repair requirements	• Daily physical check for evidence of leaks (visual, audible, odor) • Quarterly inspection of connectors on stationary tanks or cargo tanks that supply LPG • Daily and Quarterly checks and inspections not required for portable tanks (e.g., forklift, barbeque tanks) • Conduct bubble test of connectors at stationary tanks receiving LPG during or immediately following the transfer • Any connector identified as leaking or defective must be removed from service, repaired and tested before returned to service and the repair recorded in a repair log [PR 1177(e)]	• Repair or alteration affecting the safety of any container or cylinder has to be authorized by a qualified inspector. The owner or user of the LP-Gas container shall ensure that the repair or alteration is performed by a company with a valid ASME "U" or a National Board "R" Certificate of Authorization • A container or cylinder that has been subjected to a fire shall not be returned to service until it has been inspected by a qualified inspector and found to be safe and cannot be recharged until it has been retested in accordance with the requirements for its original hydrostatic test and found to be suitable for continued service [8CCR 494]	Inspection and test intervals for cargo tanks: • 1 year for external visual inspection and leakage • 5 years for internal and pressure test • Inspection must be performed by DOT registered inspectors • All required tests and inspections must be documented and certified by the inspector • A cargo tank that fails inspection must be either repaired and retested, or must be removed from service • Repairs to DOT cylinders shall be made under DOT regulations and control in accordance with the requirements of 49 CFR Section 173.34
Training	LPG bulk loading or LPG transfer and dispensing facilities must have a training program in place consisting of: • Written training procedures; • Training frequency and scheduled training dates; • Written record of dates training was provided; • Record of upcoming training schedule [PR 1177(e)]	• Emergency response training • Initial 24 hrs training 8 hrs annual refresher annually [8 CCR 5192 (Hazwoper)]	• New employees must complete hazmat training within 90 days from hiring and every 3 years thereafter • Employer must maintain records of employee training, such as the hazmat employee's name, the most recent training completion date of the hazmat employee's training, a description, copy, or the location of the training materials used, the name and address of the person providing the training; and certification that the hazmat employee has been trained and tested

Section	AQMD	Cal OSHA*	DOT
Recordkeeping requirements	LPG bulk loading or LPG transfer and dispensing facilities must maintain: • Records of all FLLG and connectors installed or repaired of FLLG and connectors during daily inspections • Repair logs with date and time of repair, name of person performing the repair and employer phone and address, description of service performed and identification of each component repaired • Maintenance records for vapor recovery or equalization systems • Documentation that installed low emission FLLG or LPG low emission connectors used to comply with rule meet applicable rule definition [PR 1177(f)]		Retain shipping records for one year
Reporting requirement	• LPG bulk loading and LPG transfer and dispensing facilities that offer LPG for sale to an end user must submit annual reports of the LPG purchased and dispensed volume for each calendar years 2013, 2014 and 2015 no later than July 1 of the subsequent calendar year; • LPG bulk loading facilities must submit an end of year inventory of installed LPG low emission connectors by July 1, 2014 for calendar year 2013. • LPG bulk loading facilities must submit annual inventory of containers and associated FLLGs for calendar years 2013 through 2017 no later than July 1 of the subsequent calendar year [PR 1177(g)]	The owner or user of a LPG container has to report all repairs or alterations affecting the safety of LPG tanks to the DIR within 21 days by the ASME "U" or National Board "R" certificate holder making such repairs or alterations using the appropriate National Board Form, "R-1", Report of Welded Repair, or "R-2", Report of Alteration [8CCR 494(e)]	Submit incident reports within 30 days
Leak detection methods	Daily physical checks and bubble test or Method 21 [1177(h)]		
Confidentiality of information	Information submitted to the Executive Officer may be designated as exempt from disclosure per Govt. Code §6250-6276.48 [1177(i)]		

*Department of Industrial Relations

COMMENTS AND RESPONSES

Comments from Public

The following comments were received with regards to the public workshop conducted on August 25, 2011.

Applicability

Comment #1

The LPG transfer and dispensing industry is subject to regulations from multiple agencies. The District should ensure that the proposed rule does not conflict with existing regulations and should also take steps to remove any unnecessary duplication.

Response

The District has reviewed the federal, state and local requirements, especially those for fire protection, and has developed the proposed rule that is complementary in nature to existing regulations, while providing additional benefits centered on improving air quality. The proposed rule, developed with significant input from the LPG industry, leverages current training and inspection procedures wherever possible, and minimizes any duplication of existing recordkeeping or reporting requirements.

Comment #2

Does the proposed rule apply to emergency LPG fuel tanks that service emergency equipment? LPG fuel is transferred to emergency internal combustion engines for backup power from the LPG storage tank.

Response

The proposed rule would apply to the LPG transfers into the storage tank, but not any subsequent transfers from the tank to the generators. The proposed rule is focused on transfers that involve emissions from either disconnections or venting from fixed liquid level gauges, rather than transfers associated with feeding of fuel into the combustion equipment itself. The proposed rule language has also been updated to limit the inspection and reporting requirements to LPG Bulk Loading facilities and LPG Transfer and Dispensing facilities that offer LPG for sale to an end user. Therefore, specifically with respect to LPG stored as emergency fuel, the LPG low emission connector requirement would apply to the LPG fuel provider, but not to the emergency engine operator.

Definitions

Comment #3

The definition of container should reference the ASME specifications.

Response

Staff has included a reference to ASME specifications in the definition for stationary storage tank. However, the container definition is intended, for the purpose of this proposed rule, to be a generic reference that includes both cylinders and tanks, the former being more specifically covered by DOT rather than ASME standards.

Comment #4

The definition of dry-break coupling or dry disconnect coupling is unnecessary because the proposed rule only requires LPG low emission connectors.

Response

The terms and associated definitions for dry-break coupling and dry disconnect couplings have been removed from the proposed rule.

Comment #5

The inspection requirements should rely on a physical examination and use of a bubble test rather than the expensive Method 21 that can result in false positives. The LPG industry has a built in incentive to minimize leakage of a valuable product in addition to the safety requirements from other agencies authorities, including NFPA, DOT, WPGA, CHP, etc. As such, leaks should not be considered to be a significant issue.

Response

The self-inspection requirement has been updated to rely on physical examination and use of a bubble test rather than Method 21. Staff believes that the Leak Detection and Repair (LDAR) program included in this proposed rule is vital to further evaluate the potential leaks as a source of additional VOC emissions.

Comment #6

We recommend amending the definition of LPG Vapors to read: "LPG VAPORS are organic compounds occurring in vapor form as well as entrained liquid within the container. Small quantities are released to atmosphere upon completion of the LPG transfer and dispensing operations."

Response

Use of the term "LPG Vapors" in the proposed rule is limited to the definition of "LPG Vapor Recovery or Equalization System." The purpose of the definition is to clarify that entrained liquid that is recovered by these systems would be considered when determining proper operating efficiency of the LPG vapor recovery or equalization system. The addition of the last sentence referring to the quantity of

emissions released appears to be editorial and staff believes the staff report adequately addresses the descriptive nature of the comment.

Comment #7

We recommend deleting the definition of "Liquid Tight." This is a reference to liquid fuels. When liquid propane is released into the atmosphere, it vaporizes. Further, emission rates for propane are measured in cubic centimeters for the rate of emission and size of cavity from which emissions come.

Response

A LPG leak of sufficient volume can be observed in liquid form, although it's presence as a liquid would be limited following its release due to volatilization. The District would view a connector that is not liquid tight as resulting in greater loss than a connector that is not vapor tight.

Comment #8

Why is there a separate definition for "mobile fueler" in addition to "bobtail?"

Response

District staff believes that the denotative meaning of bobtail would not include trailer tanks, and have included the definition for mobile fueler to account for these various types of LPG transports.

Comment #9

We suggest deleting the "performance test" definition. This appears to be a provision taken from the gasoline vapor recovery regulation. The propane industry does not have a standard vapor recovery system other than for offloading railcars and transports.

Response

The intent of including the "performance test" definition was to provide an example of the criteria manufacturers may use in ensuring proper operation of an LPG Vapor Recovery or Equalization System. However, because manufacturer criteria may vary and are not the primary focus of the proposed rule, the term "performance test" has been removed, and the language associated with demonstrating proper maintenance of LPG Vapor Recovery or Equalization Systems updated to allow facilities to confer with manufacturers in determining the appropriate form of documentation.

Comment #10

We suggest amending the definition of “valve” to read:

"VALVE is a device that regulates or isolates the fluid flow in a pipe, tube, tank, or conduit by means of an external actuator."

Response

Agree. The word "tank" has been added to the definition for valve.

Comment #11

Analyzers should not be required to be calibrated with methane.

Response

The calibration standard is based on methane for consistency with a leak threshold of 10,000 ppm and Rule 1173. In addition, the inspection procedure section has been updated in the proposal to rely on the industry requested bubble test, rather than Method 21.

Comment #12

The inspection requirements should specify whether the leak being checked for is a vapor or liquid leak and the criteria used to establish the presence or absence thereof. In addition, the types of components subject to the inspection requirements should be further clarified to distinguish between connectors and components such as pumps and sight glasses, flanges and threaded connections.

Response

The inspection requirements have been updated to refer to connectors rather than components.

Comment #13

How does the proposed rule distinguish between facilities that offer LPG for sale to an end user and those that transfer or dispense LPG only as a support function? An example of the latter would be a facility that maintains a smaller LPG tank to fill forklift propane tanks as a contingency for supply disruption normally covered through a cylinder exchange program with a LPG supplier. Should there be a threshold on the requirements based on tank size, throughput, or categorization as a primary business?

Response

The proposal has been updated to clarify the intended rule applicability. The inspection requirements are limited to owners and operators of Bulk Loading and Dispensing facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user. However, the use of LPG low emission connectors and low emission

FLLGs would apply to all LPG transfer and dispensing facilities, and are the responsibility of the owner of the equipment.

Comment #14

Facilities, such as refineries that are subject to Rule 1173, should be excluded from the proposed rule.

Response

The proposed rule has been updated to exclude facilities subject to Rule 1173. Staff plans to further evaluate both rules to assess any additional controls that may be necessary for facilities currently subject to Rule 1173.

Cost-Effectiveness

Comment #15

There are several issues associated with retrofitting stationary storage tanks with low emission FLLGs in the field. While many can be retrofitted fairly readily, there are a percentage of tanks (between 5 and 50 percent, depending on the composition of the LPG supplier's tank inventory) that have either intentionally crimped (as a safety design) or damaged vent valves which require additional precautions up to removal from the field. Field removal would result in additional emission from trucks used for removal, and also result in other additional costs and business disruption, including providing continuation of LPG fuel service to the customer and any recertification or re-permitting for the upgraded tank, which may included servicing at a DOT certified facility. It should also be noted that residential tanks subject to retrofitting are often located at lower income areas that are more sensitive to cost.

Response

Although staff understands that based on feedback from the LPG industry, most tanks can be readily retrofitted with low emission FLLGs in the field, it is not uncommon to encounter tanks where difficulties arise as noted. To accommodate these circumstances and address numerous comments, the proposed rule has been updated to extend the compliance deadlines over a five year period, aligning retrofit schedules to customer change-outs and similar maintenance activities.

Comment #16

The costs to implement the proposed rule are prohibitive. Major contributors to cost include the tight time schedule for retrofits, use of Method 21 and requirement to test field tanks that are infrequently filled. The additional costs associated with scheduling which could be mitigated by allowing retrofits to occur as part of existing out-of-service obligations such as tank requalification, recertification, re-permitting, customer change-outs, etc., and the inspection costs could be reduced by relying on more effective less costly physical inspections with bubble test verification rather than

Method 21. With respect to retrofitting of FLLGs, it should be noted that an analogous effort to retrofit cylinders with an overfill protection device (OPD) occurred over a 5 year period, with retrofits still occurring as older tanks are refilled.

Response

PR 1177 has been revised with extended compliance dates, removal of mandatory Method 21 requirements, and inspection every 90 days or during a subsequent transfer where the time between transfers is greater than 90 days. Total costs and cost-effectiveness of the proposed rule have been evaluated and included as part of the staff report.

See also response to comment #15 and response to comment #5 for additional discussion.

Equipment and Operation Requirements

Comment #17

There are several issues associated with retrofitting portable storage tanks. From a cost perspective, the tight schedule imposes additional costs which could be avoided if the DOT cylinders would be retrofitted in conjunction with the 5 year requalification schedule (12 year for new cylinders). In addition, commercial availability of the low emission FLLG is uncertain, and because of the space availability on the smaller cylinders, retrofitting of the cylinder would require replacement of the entire valve assembly. While cost estimates for the low emission FLLG is $7 per unit, for the valve assembly the cost is about $20 per unit and would need to be passed on to the customer.

Response

The compliance deadlines in the proposed rule have been extended to up to five years to better accommodate cylinder requalification cycles, primarily based on feedback from the industry. While low emission FLLGs are not currently commercially available for all applications, FLLG manufacturers have indicated that availability should not be an issue with respect to the proposed compliance timeframes. Total costs and cost-effectiveness have been evaluated and included as part of the staff report and the overall cost effectiveness for this proposed rule is approximately $1,700 per ton of VOC emissions reduced, which is well below the acceptable limit for VOC-related rules. It should be noted that additional cost savings resulting from lowered LPG product lost to emissions should help mitigate some of the retrofit costs.

Comment #18

What testing has been performed to estimate the emission reduction potential from use of the low emission FLLGs?

Response

A discussion on FLLG emissions is included in the LPG Emission Factor Determination section of this staff report. FLLGs with number 72 size orifices were tested, including the self-cleaning design that incorporates a drill bit insert designed to represent an equivalent orifice opening, with emission reduction results ranging from 50% to 70%. The most recent test by the District in December 2011 represents the low end of the emission reduction results and is conservatively used for calculating emission estimates. The higher end of the tested results (Battelle, 2009), relied on indirect measurements of LPG loss (using air flow as a surrogate) and may be more representative of the potential reductions from a controlled environment rather than the more direct weight loss protocol that the District test employed.

Comment #19

Although use of a low emission FLLG is expected to result in reduced emissions, consideration should be given to fill-by-weight operations as well as other alternative filling methods that do not utilize the FLLG. Because of the open-ended nature of the cylinder exchange model, such providers would be disproportionately burdened with the responsibility of retrofitting thousands of cylinders while filing in a manner that does not rely on the FLLG.

Response

The proposed rule has been updated to account for fill by weight techniques or other technology, providing a mechanism for alternatives to retrofit and use of the low emission FLLG.

LPG transfer at LPG Bulk Loading Facilities

Comment #20

Vapor tight caps are not currently being used. Vapor tightness is ensured by the shut-off valve, while the caps only serve as dust caps.

Response

The requirement to use vapor-tight caps has been removed from the proposed rule. The condition of vapor tightness will rely on the shut-off valve.

Inspections

Comment #21

Would DOT required training be sufficient to meet the training obligations of the proposed rule? The industry is also subject to other training requirements such as HM126 every three years, and Certified Employee Training Program (CETP) courses for LPG equipment. If Method 21 is required, can the District offer training?

Response

Based on comments from the LPG industry, the proposed rule requires training of any employee that implements the leak detection program, including the daily physical checks of connectors and quarterly inspections, including administration of the bubble test. It is the District's understanding that the DOT training generally covers these aspects, however, the facility owner or operator should review their specifically implemented training program to ensure consistency with the proposed rule.

The proposed rule has been updated to change the use of Method 21 as a requirement to an option.

Operator Inspection Program Requirements

Comment #22

The District should require an epoxy affixed bar code sticker for each tank to facilitate leak testing.

Response

The proposed rule requires facilities to maintain an inventory of affected connectors and FLLGs with information sufficient for identification, but does not specify how the facility would uniquely identify each tank or affected inspection unit. Staff believes the facilities would be best equipped to identify the mechanism for tank identification and therefore prefers to defer the specification to affected owners and operators. The affixed bar code sticker may be one of the available options.

Comment #23

Leaks detected and repaired under the daily inspection program would not be considered violations. What would constitute a violation with respect to leaks? Would leaks detected under the quarterly inspection or components taken out of service in lieu of repair be handled differently?

Response

Any leak detected by an owner/operator and subsequently repaired prior to being returned to service, and documented appropriately would not be considered to be a violation of the proposed rule. However, if the District determines as part of a field inspection that a connector exhibits a leak greater than 10,000 ppm using Method 21, or exhibits a visible mist, it would not be considered to be vapor tight or liquid tight respectively and therefore subject to violation.

Reporting and Recordkeeping

Comment #24

The annual reporting deadline is too short and the requirement may overlap with API reporting that is already voluntarily submitted. Can the District explore opportunities to harmonize reporting of information to other entities and on concurrent schedules to minimize additional burdens?

Response

The proposed rule has been updated to extend the report submittal deadline from April 1 to July 1 of the following calendar year and limit the reporting to calendar years 2013, 2014 and 2015, based on comments from the industry. Facilities would be able to use information submitted to API in the report to the District. However, because the API reporting is voluntary, staff believes incorporation of the reporting requirement in the proposed rule is necessary to ensure consistency and completeness of the data.

Comment #25

It is unclear how the required reporting of annual sales is useful for determining air quality impacts. If sales data is to be used to assign emission values to individual facilities, it should be noted that there are a number of underlying variables that would make such correlations difficult. It is not uncommon for facilities to rule out one to five percent when reconciling sales and dispensing activities due to variations and uncertainties in correlating volume and weight from temperature and pressure dependent product densities (and standardized conversions), accounting differences in sales by volume, by weight, or by service provided (i.e., charge on a per container/cylinder rate, or other billing cycle not directly linked to real-time transfers or actual dispensing quantities).

Response

The WPGA commissioned a report to estimate emissions from LPG transfer and dispensing. This 2011 report uses annual sales data as the starting point for estimating the District-wide LPG transfer, dispensing and disconnect activities and correlates average FLLG release rates from test data and entrapment volumes for connectors to estimate overall LPG emissions.

The District used the methodology of the WPGA report to evaluate emissions, with an adjustment for the amount of time the FLLG was used during the fill cycle (the WPGA report assumes 60 seconds independent of the fill time, whereas the District estimate assumes FLLG use during the entire filling time, based on average fill rates estimated by an earlier CARB report, supported by follow-up conversations with industry representatives and NFPA requirements). An additional adjustment to the WPGA report methodology is the estimate of the fill capacity (the WPGA report

assumes that all tanks are filled to 80 percent capacity from an empty starting point, whereas the District estimate assumes that bobtail trucks cargo tanks, and commercial and residential tanks are partially filled on average). Appendix B – Emission Inventory Calculations of this staff report contains further emission inventory calculation details.

The purpose of obtaining the sales data is to confirm the estimated sales data attributed to the District to support the emission estimates and emission reduction estimates of the proposed rule, based on the aforementioned methodology. The dispensing data is intended to validate the assumption that sales data is representative of the transfer and dispensing activity within the District, on an aggregate basis.

It is not the intention of the proposed reporting requirement to assign material balance based emission values to individual facilities or to the industry as a whole and the District recognizes that the reconciliation of gross sales and dispensing values contains many variables and uncertainties, similar to other area (non point) sources of emissions. It should also be noted that the proposed rule is only requiring purchase and sales data reporting for three years in order to compare to the API data and to be able to interpret possible usage and seasonal trends that may exist in the District.

Comment #26

What protections are provided for the reporting of sensitive confidential sales data required under the proposed rule?

Response

The proposed rule has been updated with the following provision (subdivision (i)):

> "Subject to the provisions of the California Public Records Act (Govt. Code § 6250-6276.48) information submitted to the Executive Officer may be designated as confidential. The designation must be clearly indicated on the reporting form, identifying exactly which information is deemed confidential. District guidelines require a detailed and complete basis for such claim in the event of a public records request."

Similar language exists in other District rules that require reporting of confidential information.

Comment #27

What is the purpose of supplying training documentation to the District?

Response

The proposed rule requires that training records be maintained for employees that are engaged in the leak detection program. Training of personnel performing leak detection daily and quarterly checks ensure proper use of the techniques and

understanding of the required frequencies required to identify leaks and verify repairs, and the records demonstrate compliance with the requirement. This documentation is not part of the reporting requirements.

Comment #28

The requirement to maintain and submit an inventory of facility components appears overly burdensome, especially the tight 30 day timeframe for reporting. What is the purpose of the proposed rule for this requirement, and what efforts have been made to minimize this burden?

Response

The proposed rule contains a phased retrofit schedule for the installation of low emission FLLGs. An inventory of affected containers and associated low emission FLLGs would be used to track implementation of this proposal.

The proposed rule has been updated to extend the reporting deadline to July 1 following the end of the calendar year. Staff has also developed sample recordkeeping and reporting forms (please see Attachment C) which industry has reviewed. Subsequent industry feedback has also been incorporated into these forms to simplify the proposed rule recordkeeping and reporting requirements.

Comment #29

The recordkeeping requirements for inspection and repair logs is not specific enough, especially with respect to the term "…but not limited to…". What format and what specific details are required by the proposed rule, and can a template be made available to minimize confusion?

Response

The term "…but not limited to…" was intended to allow additional flexibility to owners and operators to provide unique identification information. The proposed rule language of sub clause (f)(1)(A)(ii)(IV) has been updated as follows for clarification:

> "Identification of the FLLG or connector that was installed, repaired, serviced or removed, such as FLLG or connector identification information or FLLG or connector manufacturer name."

Comment #30

If LPG suppliers are allowed to keep records for inspections or reports, will the facility owner that receives LPG be able to delegate recordkeeping requirements for District inspections?

Response

The inspection requirement in the proposed rule has been updated to apply only to LPG suppliers. Therefore, the facility owner that receives LPG for consumption and does not offer LPG for sale to an end user is not obligated to inspect or keep associated records.

Comment #31

The required tracking of LPG transfers appears to double count sales volume.

Response

The purpose of tracking dispensing volumes in addition to sales volumes is to determine if the use of sales volume or dispensing volumes is a better proxy for emission estimation. The emission estimation methodology, as outlined in Appendix B – Emission Inventory Calculations, relies on the assumption that LPG sales are representative of dispensing related activities on an aggregate level. By tracking monthly and annual sales and dispensing records, the District will be able to determine if there are any seasonality issues associated with LPG transfer and dispensing and also confirm if sales is an appropriate surrogate for activity. In addition, the proposed rule has been revised to limit this reporting obligation to three years.

Comment #32

What is the purpose for tracking monthly disbursements? Can the monthly requirement be extended to an annual requirement for smaller, infrequently used tanks?

Response

The purpose for tracking monthly disbursements is to determine the extent of any seasonal variation in LPG consumption in order to evaluate impacts on air quality management planning emission inventories, which may be sensitive to summer or winter peaks. See also response to comment #31.

Fire and Safety Hazards

Comment #33

It should be noted that reducing LPG emissions from FLLG, etc. should result in a concurrent reduction in fire safety hazards, which could translate into lower insurance premiums, especially if techniques and technologies that do not rely on FLLGs are utilized.

Response

The draft staff report has been updated to acknowledge the concurrent reduction in fire and safety hazards and the potential for lowered insurance premiums with respect to lowered fugitive emissions. Staff will consider these benefits of reducing fugitive LPG release in the Socioeconomic Impact Assessment report.

General

Comment #34

It should be emphasized that the LPG industry has been evolving to low emissions equipment through routine maintenance voluntarily without regulation.

Response

The draft staff report has been updated to further acknowledge the efforts from the LPG industry to voluntarily reduce emissions prior to this rule development effort. The proposed rule leverages the LPG industry's voluntary efforts and accelerates the retrofit schedules for air quality benefits, estimated to be 6.1 tpd.

Rule Development Process

Comment #35

The notification timeline for the public workshop was too short. It is also unclear how the proposed rule applies to facilities subject to Rule 1173.

Response

The District has been conducting working group meetings with industry, including the Western Propane Gas Association (WPGA) in the development of the proposed rule, including the rule development schedule. Because facilities subject to Rule 1173 were not part of the initially intended scope of the proposed rule, the District did not make a targeted notification of the proposal to facilities such as refineries, and has subsequently added specific rule language to exclude Rule 1173 facilities from the proposal, pending further review of potential controls for facilities currently subject to Rule 1173. Staff conducted a total of seven working group meetings and participated in thirteen site visits, incorporating feedback though multiple proposed rule language iterations.

Emissions Inventory

Comment #36

The estimated emissions appear to underestimate the inventory relative to a one percent loss assumption based on sales.

Response

The methodology used to estimate emissions is outlined in Appendix B – Emission Inventory Calculations, and is based on an industry sponsored study, the California Air Resources Board's report, and additional input from District staff referencing separate communications with industry representatives, as well as both internal and external source testing data. While industry has also indicated that it is not uncommon for accounting differences between sales and dispensing records to be in the one percent range, the District is not currently correlating this difference as representative of fugitive emissions, either as an average or worse case correlation due to a number of uncertainties associated with sales records and dispensing volumes. See also response to comment #25.

SOCIOECONOMIC ASSESSMENT

~~A Socioeconomic Impact Analysis report for the proposed rule has been prepared and will be released to the public no later than 30 days prior to the hearing.~~Proposed Rule 1177 would affect LPG dealers/distributors (NAICS 454312), petroleum bulk stations and terminals (NAICS 424710), and retail facilities, the latter including both gasoline stations (NAICS 447190) and general rental centers (NAICS 532310) of roughly equal distribution. The majority of the affected facilities are small businesses.

The total average annual cost of PR 1177 is estimated to be $4.28 million from 2013 to 2025. Out of $4.28 million cost, LPG dealers/distributors would incur about $3 million (70 percent of the total cost) at $120,000 per dealer/distributor. The average annual cost of petroleum bulk stations & terminals, including those involved in gravity filling forklift cylinders is estimated to be $1.21 million (or about $6,060 per facility). The average annual cost of gasoline stations and general rental centers is estimated to be $0.07 million (or about $106 per facility).

PR 1177 is projected to have 21 jobs forgone annually in the entire four-county economy between 2012 and 2025, which is 0.0002 percent of the baseline jobs in the four-county area and are considered to be within the noise of the economic model employed for this analysis.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to California Environmental Quality Act (CEQA) Guidelines §15252 and §15162 and AQMD Rule 110, the AQMD has prepared an Environmental Assessment (EA) for Proposed Rule 1177. The environmental analysis in the Draft EA concluded that Proposed Rule 1177 would not generate any significant adverse environmental impacts. The Draft EA was released for a 30-day public review and comment period from April 3, 2012 to May 2, 2012~~. Any comments received during the public comment period on the analysis presented in the Draft EA will be responded to and included in the Final EA. Prior to making a decision on the proposed adoption of Rule 1177, the SCAQMD Governing Board must review and~~

~~certify the Final EA as providing adequate information on the potential adverse environmental impacts of the proposed project.~~ and one comment letter was received from the public regarding the Draft EA. Responses to the comments received have been prepared and the comment letter and its responses are included as Appendix C of the EA.

Since the release of the Draft EA, minor modifications have been made to the document. However, none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the Draft EA pursuant to CEQA Guidelines §15073.5. Therefore, the Draft EA is now a Final EA and is included as an attachment to this Governing Board package.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing rules, the AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication and reference, based on relevant information presented at the hearing. The draft findings are as follows:

Necessity: The AQMD Governing Board has determined that a need exists to adopt Rule 1177 - Liquefied Petroleum Gas Transfer and Dispensing, to partially implement Control Measure CM #2007 MCS-07 – Application of All Feasible Measures from the 2007 AQMP and help AQMD attain the National Ambient Air Quality Standard for ozone for which AQMD is classified as an Extreme Non-Attainment Area.

Authority: The District obtains its authority to adopt, amend or repeal rules and regulations from California Health and Safety Code Sections 39002, 39650, 40000, 40001, 40440, 40441, 40463, 40702, and 40725 through 40728, 41508, 41700, and 42300.

Clarity: Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing as proposed to be adopted, is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency: Proposed Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or federal or state regulations.

Non Duplication: Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing, as proposed to be adopted, does not impose the same requirements as any existing state or federal regulations, and the amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, the District.

Reference: This regulation would implement, interpret or make specific the provisions of: Health and Safety Code Sections 40001 (rules to achieve ambient air quality standards), 40440(a) and (c) (rules to carry out the Air Quality Management Plan and rules which are also cost-effective and efficient), 40702 (rules to execute duties necessary to preserve original intent of rule), and 40910 et seq., (California Clean Air Act).

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1. SCAQMD (2008) VOC Emissions During the Gravity Filling of a Forklift Propane Tank – Mutual Propane, Gardena, California, November 2008

2. Adept Group, Inc. (2008) LP Gas Emissions Through Outage Gauge During Cylinder Refilling – Mutual Propane, Gardena, California, November 2008

3. Battelle Laboratories (2009) Research Investigation on Testing and Evaluation of New Low Emission Fixed Maximum Liquid Level Gauges for Use in LP-Gas Containers, prepared for PERC, September 2009

4. CARB (1992) Determination of Usage Patterns and Emissions for Propane/LPG in California, May 1992

5. Life Cycle Associates, LLC (2011) Inventory of Fugitive Emissions from LPG Transfers in California, prepared for WPGA, June 2011 **(CONFIDENTIAL)**

6. Marshall Excelsior, Catalog (2010); Conference Call with Jim Zuck on January 13, 2012

7. REGO Conference Call with Dave Stainbrook, V.P. of Engineering and Mark Hall, December 14, 2011.

8. SCAQMD (2011), "Propane Tank Filling Emission Reduction Efficiency from Low Emissions #72-Drill Size Self-Cleaning Fixed Maximum Liquid Level Gauges (FMLLGs)," Source Test Report – 11-300, 2011

APPENDIX A. LPG INDUSTRY SUMMARY

LPG PROPERTIES

LPG TRANSFER AND MODES OF DISTRIBUTION

LPG USAGE

LPG SALES

LPG TRANSPORT METHODS, STORAGE AND DISPENSING

The information in this appendix is based on the June 2011 Life Cycle Associates, Inc. report that was prepared for the WPGA and supplemented by District staff research.

Liquefied Petroleum Gas (LPG) is derived from two large energy industries: natural gas processing and crude oil refining use. LPG is an organic compound having a vapor pressure not exceeding that allowed for commercial propane and is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane) and to a lesser extent butylenes, and is stored and transported under pressure in a liquid state.

Raw natural gas from wells primarily comes from any of three sources: crude oil wells, gas wells and condensate wells. Natural gas that comes from crude oil wells is typically referred to as associated gas. This gas could have existed as a gas cap above the crude oil in the underground formation or could have dissolved in the crude oil. Natural gas that comes from gas wells and from condensate wells, in which there is little or no crude oil is termed non-associated gas.

When natural gas is drawn from the earth, it is a mixture of several gases and liquids. Natural gas which is sold by gas utilities consists of about 90 percent methane. Of the remaining 10 percent, approximately 5 percent is propane and the remaining 5 percent consists of other gases such as ethane and butane. Before natural gas can be transported or used, the LPG (which is slightly heavier than methane, the major component of natural gas) is separated out.

Some LPG is also present in crude oil and is referred to as “associated gas”. In order to stabilize crude oil for pipeline or tanker transport, the associated gas is further processed into LPG. Worldwide, gas processing is a source of approximately 60 percent of LPG produced, while crude oil refining is the source of the other estimated 40 percent of LPG supplies although the ratio between gas processing and refining varies depending on geographic location.

During the crude oil refining process LPG is produced on the way to making the heavier fuels such as diesel, jet fuel, fuel oil, and gasoline. It is estimated that approximately 37 percent of propane consumed in the United States is consumed as raw material in the petrochemical industry with demand being regional and concentrated in the Gulf Coast region. Propane is also one of many possible raw material options utilized by the petrochemical industry.

LPG PROPERTIES

LPG is a petroleum product composed predominantly of any of the following hydrocarbons or mixtures thereof: propane, propylene, butanes (normal or isobutane) and to a lesser extent butylenes. Although consisting mainly of propane and butane, in some parts of the country, propane itself is commonly referred to as LPG. Propane and butane have vapor pressures (at 60 degrees F) of 107 psia and 26 psia,

respectively compared to gasoline which ranges from approximately 3.5 psia to 7 psia at the same temperature (see Table A-1).

Unlike gasoline, which is a liquid under normal or standard conditions, LPG is a vapor under similar conditions. The heating value of LPG is in the range of 22 to 26 percent less than that of natural gas. Also, the temperatures required to liquefy LPG products can be produced by refrigeration or by use of storage containers that are designed to securely hold vapors at pressures significantly in excess of the vapor pressures of LPG within normal temperature ranges. It is mainly for this reason that LPG is stored and transported in closed containers under pressure.

LPG is colorless and odorless and about 1.5 times as heavy as air in the vapor state. Therefore, it is necessary, as a fire and safety precaution, to add an artificial odorant to warn users of its presence in the event of leaks. Organosulfur compounds are usually used for this purpose with the most common odorant being ethyl mercaptan. Most states require a minimum of 1 pound of odorant to be injected into 10,000 gallons of LPG loaded.

When LPG is transferred from storage containers it is done under normal atmospheric conditions, but at operating pressures that are much higher than atmospheric using pumps. In order for the material to remain in its liquid state when transferred, it is important that delivery occur within a closed system where pressure is not compromised. Another important reason for maintaining a closed system under pressure is because LPG is sold as a liquid and therefore metered and typically paid for on a per volume basis. Maintaining a closed system ensures that the customer is paying for product that is actually transferred rather than paying for lost product.

An important value of LPG products lies in the fact that they can be stored in liquid state and used in their gaseous state. Hence the advantage obtained from reduced transportation cost is thought to be sufficient to offset the cost of liquefying these products. Also, in order to use LPG in most commercial and industrial applications it must be converted back to a gaseous state which can be accomplished by returning it to atmospheric temperature and pressure.

Table A-1. Fuel Properties Comparison

Property	Vapor Pressure (psia)		Boiling Point (°F)	BTUs per gallon
	@ 60 °F	@ 100 °F		
Propane	107	172	-44	85,000 – 92,000
Butane	26	38	32	102,032
Gasoline (CARB Phase 3)	[2]6.4 - 7.2			[1]114,000 – 125,000
Natural Gas				91,000

(1): Alternate Energy System Inc.; www.aspenycap.org

(2): CARB Gasoline Specifications; RVP varies depending on blend of gasoline
(3): BTU content depends on the grade and blend of the gasoline

LPG has multiple uses in numerous applications ranging from cooking, heating, air conditioning and transportation, as well as industrial uses where LPG can be used as a fuel in metallurgical plants or as a standby fuel. In some cases LPG is used as a chemical feedstock at manufacturing plants, and is also available for use in motor vehicles, where it is commonly referred to as autogas, although its introduction to the motor vehicle fuel market has thus far been limited.

LPG burns relatively cleanly, resulting in lower greenhouse gas emissions than most other fossil fuels when measured on a total fuel cycle[1]. However, there are many transfer points in the supply chain that are inefficient, resulting in product loss, the correction of which could translate directly into cost savings.

LPG TRANSFER AND MODES OF DISTRIBUTION

The following description and categories are highlights from the industry-sponsored analysis.

LPG Transfer

Figure A-1 is a network flow diagram that is representative of the movement of LPG from the point of production, either from natural gas or from crude oil refining to where the product reaches the end user. The diagram depicts the purchase and sale of LPG, the various methods used to transport and distribute LPG by wholesalers, refiners and retail bulk plant operators. During each transfer or dispensing activity there are potential fugitive emissions associated with each exchange.

Terminals

After production, LPG is typically held in storage at its production facility and then transported to a terminal via rail tank cars or tanker trucks, but LPG may also be sent directly to a retail bulk plant. However, most of the LPG produced within the state is sent to terminals which do not sell directly to the public, but caters predominantly to high volume transfers. At a terminal, LPG is transferred from rail tank cars which have an approximate capacity of 33,000 gallons and the terminal has the equipment necessary to load and unload tanker trucks which have a capacity of about 10,000 gallons. Typically, pumps are used to facilitate the tanker truck loading process, while compressors are used during the tanker truck unloading process. In some cases terminals also facilitate the loading of bobtail trucks which have a capacity in the range of 2,500 to 3,000 gallons.

[1] Energetics, "Propane Reduces Greenhouse Gas Emissions – A Comparative Analysis," pg. 3, 2009.

Retail Bulk Plants

A retail bulk plant can be viewed as a distribution center for retail type transactions. LPG is usually delivered to a retail bulk plant either directly from the LPG production/storage facility via rail and tanker trucks or from terminals via tanker trucks. Bulk storage tanks have a much greater water capacity than most customer tanks. They typically range in size from 6,000 to 60,000 gallons, but may be as large as 120,000 gallons.

Bobtail trucks usually fill up at bulk plants and then distribute LPG to multiple users, including retail sales facilities, residential and commercial customers and fueling stations. The residential sector consumes approximately 40 percent of the LPG sold in the District followed by the chemical sector and the commercial sector which consume 20 percent and 12 percent, respectively.

Another significant sector includes usage in internal combustion engines (I.C.Es.) which accounts for 10 percent of total LPG sales. Of this 10 percent, the majority (94 percent) of LPG in this category is used in the operation of forklifts while the remaining 6 percent is used in on-road vehicles.

The retail sales sector accounts for approximately 7 percent of the overall LPG market and consists of both onsite cylinder refilling operations, as well as a (20-pound) cylinder exchange program. Although no statistical data have been collected, the Western Propane Gas Association (WPGA) estimated that the cylinder exchange program has grown from approximately 7 percent of the retail sales sector (based on a 2005 Keatley report) to approximately 50 percent of total retail sales currently. This approximation points to a shift in consumer habits from refilling 20 pound barbecue tanks at a retail filling station to participation in the more convenient tank exchange programs which can be done at hardware stores like Home Depot.

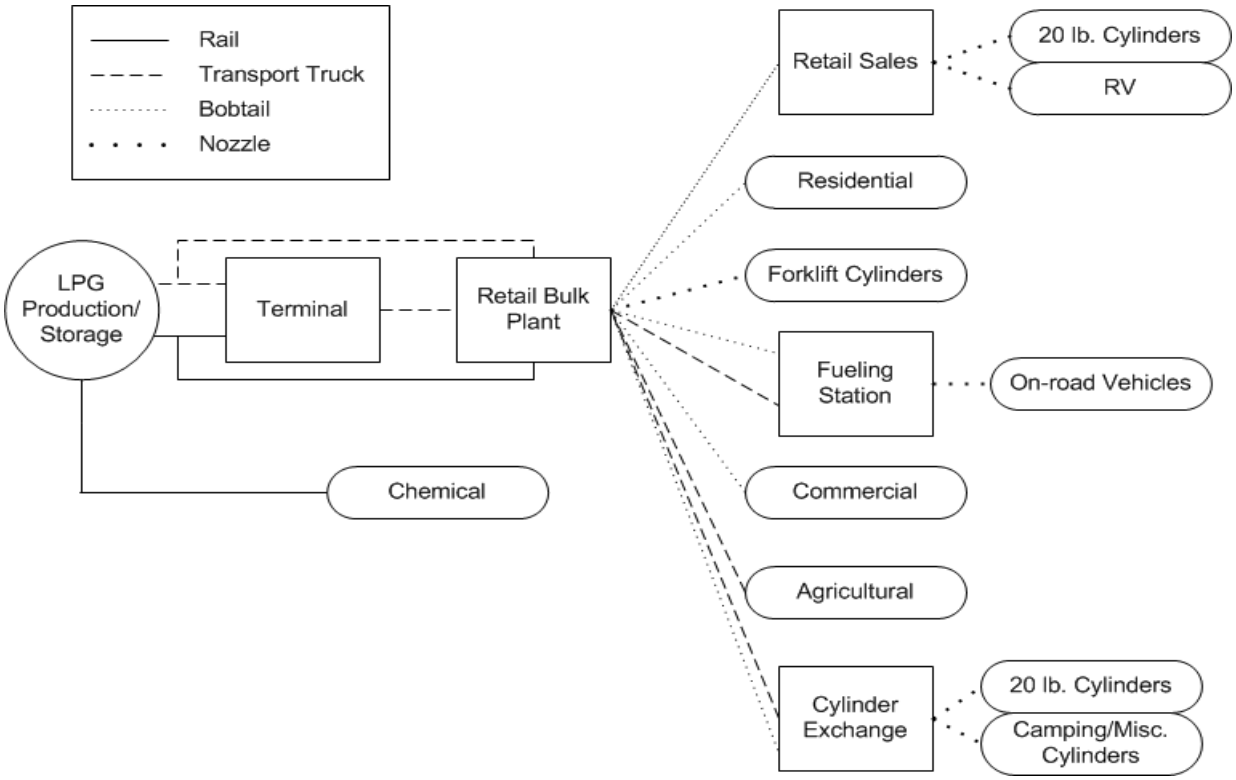


Figure A-1. Value Chain of LPG Distribution (Life Cycle Associates, LLC, 2011)

LPG USAGE

LPG sales are divided into seven (7) categories as shown in Table A-2 below.

Table A-2. LPG Sales Categories

Category	Description
Residential	Private homes (heating and cooking), recreational vehicles
Commercial	Motels (space heating and cooking), restaurants (space heating & cooking), laundries
Chemical	Raw material for chemical processing industry
I.C.E. Fuel	Highway vehicles, forklifts, oil field drilling production equipment
Agricultural	Tractor fuel, irrigation equipment engine fuel, building space heating, cooking, crop drying, tobacco curing and flame cultivation
Sales to Retail	Cylinder filling and exchange
Industrial	Standby fuel for mfg. plants, space heating, flame cutting, metallurgical furnaces

Residential

In California ~~and the District~~, residential LPG usage accounted for the largest market share of LPG sales. Typically, residential LPG is distributed in areas where there is a lack of natural gas distribution infrastructure. Residential customers use LPG for space heating, indoor and outdoor cooking, water heating, swimming pool heating, clothes drying, lighting and cooling. Recreational vehicle (RV) fueling is also included in the residential market category and LPG is used in RVs for power generation, heating and refrigeration.

Commercial

LPG is used commercially at facilities such as motels and restaurants. These facilities utilize LPG for space heating, water heating, cooking and for laundering. This category also includes sales to bottle fillers, campgrounds, and hardware stores.

Chemical

The chemical market segment in the District accounts for only 20 percent of total LPG sales. LPG is sold to the petrochemical industry where it is used as raw material in chemical processes. Some typical products manufactured include ethylene, benzene, toluene, xylene, and methanol which are the starting points for many polymers and specialty chemicals.

Internal Combustion Fuel

In this category propane is utilized for fueling highway vehicles, forklifts, and oil field drilling and production equipment. Forklifts in the District are widely used in warehouses because VOC emissions from propane combustion are much less than that from diesel or gasoline combustion. The majority of LPG in this category is used as forklift fuel. However, electric and hydrogen fuel cell forklifts have recently been replacing LPG-fueled forklifts.

Agricultural

Farm use accounts for about 7 percent of total sales in the District. LPG is used in the farming industry for fueling tractors, irrigation engines, standby electric generators, space heating in buildings (including farm houses), cooking, crop drying, tobacco curing, poultry, and other applications.

Sales to Retail

LPG is sold to locations where 20 pound cylinder filling takes place and these include dispensing stations or hardware stores which conduct LPG cylinder sales as part of exchange programs. Exchange program cylinders are filled by weight or mass at bulk loading facilities using an automated system and then delivered by trucks to exchange sites.

Industrial Uses

LPG usage in manufacturing plants includes fuel for standby equipment, space heating, and flame cutting and metallurgical furnaces.

LPG SALES

Table A-3 below shows California LPG sales data from 1999 to 2009. Although sales in California have fluctuated during this period of time, there has been an overall increase in LPG sales of almost 40 percent with LPG sales increasing from almost 500 million gallons in 1999 to almost 695 million gallons in 2009. Prior to 2003, American Petroleum Institute (API) sales data combined residential and commercial sales, but as of 2003, sales data for these two categories were reported separately. LPG sales data reported to API is voluntary and as such the sales volumes reported are not entirely indicative of the total industry sales transactions.

Due to the lack of region-specific LPG sales data for the District, a proportionality factor of 0.455, based on the District's population compared to total California state population was used to estimate the sales data for the four-county region. Baseline VOC emissions estimations for PR 1177 are based on 2009 API reported sales, which is the most recent year for which sales data has been compiled. A breakdown of LPG sales data for the District according to market sector also shown in Table A-3 below, and the distribution by sector for the District is highlighted in Table A-4.

Table A-3. Historical California LPG Sales (mgal) based on API sales data provided by Western Propane Gas Association

Category	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Residential and Commercial	302,715	288,766	199,223	240,791							
Residential	-------	-------	-------	-------	204,167	246,420	252,807	259,285	287,581	283,711	275,256
Commercial	-------	-------	-------	-------	109,912	146,220	104,266	88,015	101,518	108,513	86,639
Sales to Retailers	N/A	N/A	N/A	N/A	64,663	61,665	65,854	56,938	56,905	65,358	51,941
ICE Fuel	44,297	66,678	80,660	64,717	53,829	62,773	73,137	73,498	with-held	with-held	67,077
Chemical	89,212	180,861	135,075	N/A	N/A	N/A	N/A	N/A	N/A	N/A	135,576
Industrial	37,950	36,791	37,813	45,300	33,331	22,994	44,788	46,512	with-held	with-held	27,806
Agricultural	25,421	17,255	39,874	65,056	30,373	49,588	55,509	66,216	74,321	59,409	50,466
Total CA Sales	**499,415**	**590,361**	**492,644**	**415,864**	**496,276**	**589,480**	**573,904**	**590,464**	**651,139**	**633,053**	**694,761**
SCAQMD Sales *	**227,234**	**268,614**	**224,153**	**189,136**	**225,806**	**268,259**	**261,126**	**268,661**	**296,268**	**288,039**	**316,116**

(*) South Coast Air Basin sales is estimated at 45.5 percent of California sales based on population

Table A-4. 2009 SCAQMD LPG Sales

Market Sector	Market Subsector	Volume (mgal)	Percent Share (%)
Residential	Heating	122.01	97.36
	RVs	3.31	2.64
	Subtotal:	**125.32**	
Commercial	---	39.45	
Sales to Retail	Exchange	11.82	50
	On-site Refill	11.82	50
	Subtotal:	**23.64**	
IC Engines	Forklift	28.76	94.17
	On-road Vehicles	1.78	5.83
	Subtotal:	**30.54**	
Industrial	---	12.66	
Chemical	---	61.73	
Agricultural	---	22.98	
	Total:	**316.27**	

LPG TRANSPORT METHODS, STORAGE AND DISPENSING

Liquefied Petroleum Gas (LPG) Transport Methods

Railroad Tank Cars

Railroad tank cars deliver propane to bulk plant unloading stations in large quantities. Railroad tank cars are by far the largest DOT tanks that transport LPG, ranging in size from 4,000 – 45,000 gallons water capacity and equipped with fittings and valves enclosed in a protective dome that is located on the top of the cargo tank (see Figure A-2). The railroad tank cars observed in the District are in the range of 30,000 – 34,000 gallons water capacity and can be emptied in 45 minutes to an hour with the use of a compressor or pump.

The typical LPG rail tank car only has openings on the top and none on the bottom. Unloading racks or stations have a ladder and platform that provide access to a manway on the railroad tank car. There are valves, including the emergency shut-off valve housed in the dome on the top of the rail tank car. Also included in the dome area are liquid and vapor hose connections which connect to the plant piping system to allow the transfer of LPG from the rail tank car to different locations of the plant. Multiple tank cars may be loaded or unloaded without moving the cars.

LPG Transfer

In the absence of a vapor compressor, a railroad tank car will always have a small amount of residual liquid remaining even when a pump is used to transfer the product (LPG). Because of the limitations associated with the use of pumps in this application, vapor compressors are more suited for unloading LPG from rail tank cars.

A compressor shown below in Figure A-2 with a 4-way valve system is used to facilitate the transfer of LPG from the rail tank car to the bulk plant storage. In order to move liquid LPG product from the railcar to the storage tank, the compressor draws vapor from the vapor portion of the storage tank into the compressor where it is compressed slightly. The slightly compressed vapors enter the top of the rail tank car, thereby increasing the tank car pressure and reducing the storage tank pressure. This difference in pressure will then cause the liquid to move through the liquid line from the railcar to the storage tank.

Vapor Recovery

Once all the liquid has been removed from the tank car, the compressor 4-way valve system setting is rotated 90 degrees to allow the vapor flow to change direction, thereby pulling vapors from the top of the tank car and discharging them into the storage tank's liquid section to prevent excessive pressure build up (in the storage tank) as shown below in Figure A-3. The liquid line valve is placed in the closed position. Once these adjustments are made the compressor can withdraw vapor from the top of the railcar, compress them slightly and discharge them into the liquid

section of the storage tank. The storage tank liquid will condense these vapors back to liquid. The key to this process is to facilitate the movement of the vapors and condense them, but to do so in such a way that the changes in pressure in the two vessels are gradual.

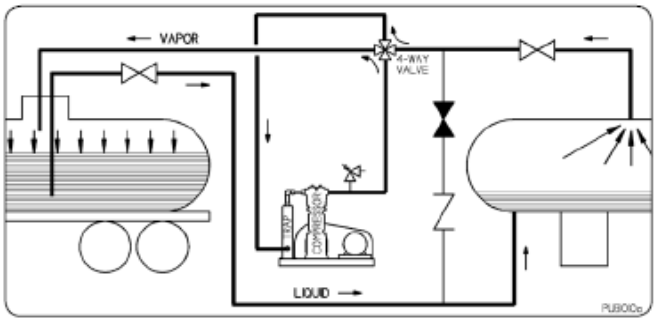


Figure A-2. Liquid LPG Transfer[2]

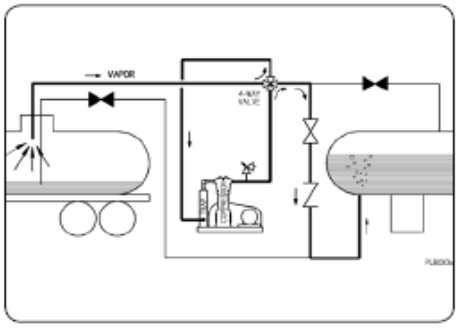


Figure A-3. LPG Vapor Recovery[2]

Transport/Tanker Truck

Transport trucks or tanker trucks have a water capacity of approximately 10,000 gallons. When a transport truck is being unloaded its liquid line is connected to that of the storage tank liquid line. Similarly, vapor lines from the transport truck and the storage tank are connected, thereby forming a closed loop vapor return/equalization system that promotes the transfer of LPG.

Transport trucks are also equipped with either a pump or a compressor that is used during the offloading process. Using a compressor is more effective in facilitating a more complete transfer of liquid LPG from the transport truck and the transfer lines, while when a pump is used the hose of the liquid line may still have residual liquid.

Bobtail Truck

A bobtail truck has a water capacity in the range of 2,500 – 3,000 gallons and is used to transport LPG to residential, commercial and retail sales facilities. These facilities will usually store relatively smaller amounts (less than 10,000 gallons) of LPG. On a typical delivery route a bobtail truck can make multiple deliveries since most residential tanks are commonly 150 – 300 gallons, and a commercial tank, which can be as large as 1,000 gallons are typically also smaller than a bobtail.

Unlike a transport truck, a bobtail truck does not have a vapor return/equalization line. However, a bobtail truck has a hose which is extended to the customer's storage tank, in addition to a pump which helps to transfer LPG. Upon completion of the transfer process, the hose is rolled back onto a spool and the driver makes the necessary preparation for another delivery.

[2] Courtesy of Blackmer®, a Dover Company.

Also unlike a transport truck, when a bobtail truck is filled it utilizes a fixed liquid level gauge (FLLG) which may be opened to varying degrees either intermittently or continuously, depending on operator practice. Opening of the FLLG ensures that the product (LPG) in the tank remains at a safe level during filling and overfilling is prevented. The bobtail truck's cargo tank usually has a separate gauge that indicates the LPG volume, and an operator will usually determine that a tank is filled when liquid level is somewhere in the range of 80 to 87 percent capacity depending on season, temperature or the period of time that the LPG is allowed to remain in the cargo tank before delivery.

Liquefied Petroleum Gas (LPG) Storage Vessels

Propane cylinders are the most common type of LPG storage vessels. All cylinders used for LPG services are manufactured according to the Department of Transportation (DOT) specifications. Twenty (20) pound barbecue cylinders are by far the most common cylinders followed by forklift cylinders which are used predominantly at industrial facilities. In addition to cylinders, LPG storage containers also include storage tanks that are used at residential and commercial facilities.

Barbecue Cylinders

The 20-pound cylinders are typically used in gas grills, but are also used to fuel the type of space heaters that can be found at outdoor restaurants. These cylinders have a water capacity of 4.7 gallons and can be refilled at a local retailer or exchanged at a cylinder exchange station. Cylinders are usually filled at a bulk plant and then delivered to the exchange site. According to the Western Propane Gas Association (WPGA), over the last few years there has been a shift from refilling these tanks at a retail station to replacing an empty cylinder by going through an exchange program.

Forklift Cylinders

Thirty-three pound LPG cylinders are usually used to power most of the forklifts used at industrial sites, however, larger forklifts use 40 pounds LPG cylinders. These cylinders can be used either indoors or outdoors. LPG for forklift usage is usually in liquid form and cylinders are mounted horizontally on the back of the forklift. The tank gauge for this application may be designed to accurately indicate LPG levels when the tank is in either a horizontal or a vertical position.

LPG forklift cylinder delivery service is offered by many companies, but some companies also fill their forklift tanks onsite. Cylinders that are filled offsite and are transported are required to be filled by weight according to DOT regulations.

Forklift cylinders can be filled by three (3) different methods, which are by weight, by volume or by gravity.

Fill by Weight

The fill by weight method employs the use of a pump to facilitate the transfer of LPG with the FLLG closed during the transfer. The completion of the filling process is determined by a weight setting using a scale.

Fill by Volume (or Pressure Fill)

The fill by volume method is the most common approach used across all segments of the LPG transfer industry. Like the fill by weight method, a pump is used to move the product (LPG), but in this case the operator will open the FLLG of the tank or cylinder receiving LPG to allow for vapor expansion during the process.

Fill by Gravity

The gravity fill method is an additional approach currently used for forklift cylinder filling. Use of this method is seen in some companies that have a very small forklift operation. LPG delivered by a supplier to the small operation is stored in a tank that can range from 50 to 400 gallons with an average (delivery) frequency that can range from once every two weeks to once every four weeks. The company will then use this supply to fill their forklift tanks. Unlike the fill by weight and fill by volume methods, there is no pump used to move the LPG and the transfer is facilitated by the pressure difference between the two containers. It should be noted that in this case the FLLG is left open during the entire transfer process.

Residential and Commercial Storage Tanks

Residential storage tanks can range from 150 – 500 gallons and commercial tanks from 250 – 1,100 gallons. These tanks are filled by bobtail trucks and may be filled up to levels ranging from 80 – 87 percent of total capacity depending on the ambient temperature. Some tanks have more than one (1) FLLG to facilitate the different fill levels. During the summer months operators are more likely to fill these tanks to the 80 percent level to allow for expansion at higher temperatures.

Liquefied Petroleum Gas (LPG) Fuel Dispensing/Delivery

Figure A-4 below represents a simplified version of an LPG dispensing system. There are four (4) essential functional components which make up the system and they are: 1) a storage tank; 2) a pump; 3) a metering unit and 4) the piping (including valves and other control elements) that connects these components and leads from the metering unit to the dispensing nozzle or connector.

The design of the system must also reflect its use in a specific delivery application. In situations where transfers are made from bulk loading facility storage tanks to transport trucks, transfers are typically completed at rates of 100 gallons per minute (gpm) or higher. When these transport trucks make deliveries to retail facilities,

transfer rates are approximately 50 to 60 gpm. Residential deliveries are made at transfer rates which are even lower and typically at about 30 gpm.[3]

The system is closed and must not allow the leak of either liquid or vapor. In addition, the system is usually designed to withstand high pressures and specifications regarding operating pressures that the system must be capable of withstanding have been developed by the American Society of Mechanical Engineers (ASME) Pressure Vessel Code, Section 8 and have been adopted by the State Fire and Safety Codes. The system must be capable of minimizing the production of vapor within the system, eliminate small amounts of vapor that are produced and must also be equipped with pressure relief valves, which are designed to permit a controlled venting of the product to the atmosphere when internal pressures exceed safe limits.

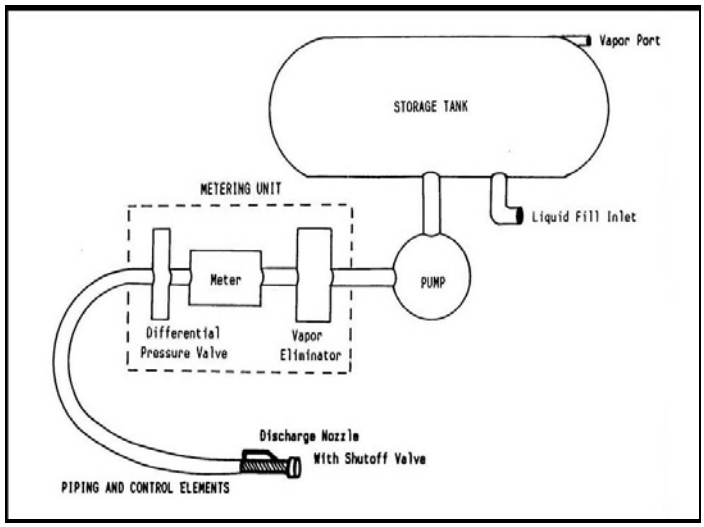


Figure A-4. Basic Components of an LPG Delivery System

Storage Tank and Pump

As shown in the Figure A-4 above an LPG storage tank is designed with a liquid fill inlet for supplying product and a discharge line with an outlet for delivery. A storage tank also has a vapor port that accommodates the insertion of a pressure equalization line to increase delivery efficiency under certain circumstances. The vapor port also allows for volumetric testing or system calibration.

The pump provides pressure to move product from the storage tank to the receiving tank and its design and operating characteristics are based on its application. Also, the discharge rate and pressure of the dispensing system have to be appropriate for the system to which it delivers product.

[3] CARB "Determination of Usage Patterns and Emissions for Propane/LPG in California," May 1992.

Metering Unit

Liquid LPG is measured as it passes through the metering unit. There is also an indicating unit which is designed to register the quantity of liquid as it passes through the meter. Measuring and registration occur simultaneously, thereby allowing the system operator and customer to monitor the amount of liquid that is being delivered continuously throughout the delivery.

Vapor Eliminator and Differential Pressure Valve

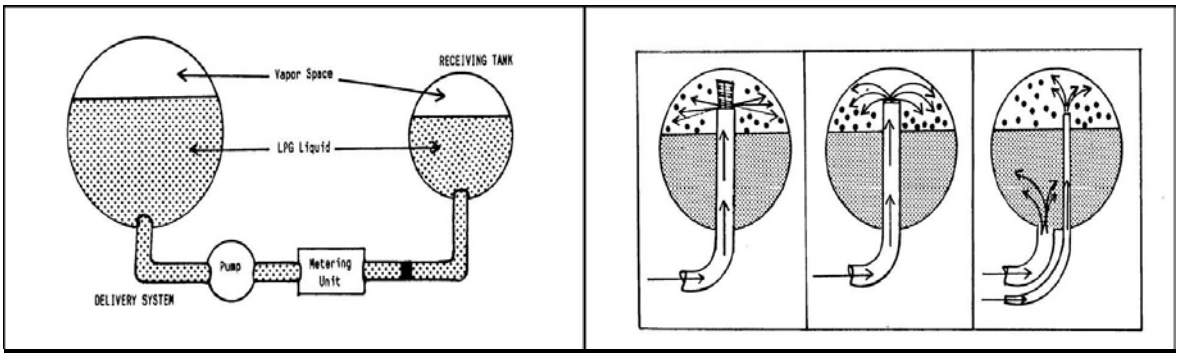
As shown in Figure A-3, above, the metering unit includes the vapor eliminator and the differential pressure valve. The function of these devices is to prevent vapor from entering the meter and being measured along with liquid product. The vapor eliminator separates any vapor that is produced from the liquid flow before it reaches the meter and returns it to the vapor space of the storage tank. The differential pressure valve maintains the product in its liquid state as it passes through the meter by restricting flow on the discharge side of the meter and thus maintaining a uniform pressure in the piping and metering element upstream that is at or above the product vapor pressure.

As liquid is drawn from the storage tank the liquid pressure drops causing some of the liquid product to boil since its boiling point is -44 degrees Fahrenheit and increasing vapor in the tank vapor space. This is typical of any liquid LPG delivery system.

Receiving Vessels

Both the receiving vessel and the delivery system contain a combination of vapor and liquid at all times. As the liquid is pumped into the receiving tank and the level rises the vapor becomes compressed thereby causing the pressure and temperature in the receiving vessel to rise. When equilibrium is eventually established and vapor condenses and returns to the liquid phase.

Previously, older vapor return systems were designed to alleviate the pressure build-up problem by connecting a vapor line between the vapor spaces of the two tanks. This would allow for equilibrium in both the delivery and the receiving tanks. However, this is not beneficial to the purchaser because product that was being purchased was being returned to the seller in the form of vapor.



Delivery of Product Spray Fill Method

Figure A-4. Delivery of Product and Spray Fill Method

Spray Fill

Delivery systems now consist of a pipe from the receiving tank that is extended into the vapor space and is designed in such as way that the incoming liquid product is sprayed upward toward the top of the tank as shown in Figure A-4. As cooler liquid droplets descend they condense the vapor, thereby lowering the pressure in the receiving tank and allowing the system to pump to deliver liquid product more efficiently.

LPG Motor Fuel Dispensing

The construction of an LPG filling station appears to be quite similar to a gasoline filling station. LPG filling stations/dispensers offer services depending on customer demand. A dispenser can be a simple unit consisting of basic elements of pumping and metering or a state-of-the-art data collection and processing module equivalent to that used at gasoline dispensing stations. A typical fill rate of a motor vehicle using LPG is about 10 gallons per minute.

APPENDIX B. EMISSION INVENTORY CALCULATIONS

METHODOLOGY

VOC fugitive emissions from LPG transfer and dispensing operations result from three main areas:

1. Line Disconnects. VOC emissions result from volatilization of entrapped product from the housing of various hoses, dispensing nozzles and interconnections during disconnection, and are based on estimated entrapment volumes and the LPG liquid or vapor state physical properties during disconnection, as well as an estimated number of disconnections based on an industry sponsored study of the LPG transfer and dispensing profile[1].

2. FLLG Venting. VOC emissions result from venting of LPG through FLLGs used as a safety device to ensure that pressurized receiving containers, cylinders and tanks are not overfilled. These emissions are based on source test emission rate data[2] and an estimation of venting time associated with the filling of cylinders and tanks.

3. Leaks. VOC emissions can result from leaks in the equipment used for transfer and dispensing. Because PR 1177 addresses only minimum due diligence associated with leaks, emissions and reductions have not been estimated.

The methodology used to estimate emissions and reductions associated with PR 1177 are based on the industry sponsored study, with some adjustments to assumptions as noted individually and as summarized in a subsequent section in this appendix labeled "Assumption Differences".

ASSUMPTIONS

The following assumptions are used to assist in the estimation of fugitive VOC emissions from LPG transfer and dispensing:

1. The overall level of LPG transfer and dispensing activity by industry sector, as evaluated by industry, is accurate and representative, including the estimated proportion of activity within the District. The industry study correlation between sales reported through the American Petroleum Institute (API) and LPG transfer and dispensing activity is appropriate and representative.

2. The industry study estimated FLLG emission vent rate from conventional (number 54 orifice size) valves is accurate and representative.

3. The industry study estimated emission reduction from vented VOC emissions of roughly 70% from the use of low emission FLLG (number 72 orifice size or equivalent) is accurate and representative of the maximum reduction achievable.

4. The emission reduction percentage of 50% from replacing a number 54 to a number 72 orifice size in the FLLG as evaluated by District Source Test[2] is accurate and representative and demonstrates an improvement over the industry study[3] because the

sampling involves losses from the entire container rather than focusing on releases from only the orifice.

5. The FLLG venting cycle is concurrent with the filling cycle for stationary tanks and portable cylinders and the FLLG vent is used during 100% of the transfer time when filling by volume. This represents an adjustment from the industry-sponsored study which relied on an assumption that the FLLG vent cycle is independent of the transfer time and equal to one minute per transfer.

6. The District Source Test (2011) estimates for FLLG LPG vapor release rates of 2.01 g/s (#54 size orifice) and 0.98 g/s (#72 size orifice) and LPG liquid release rate of 11.3 g/s (#54 size orifice) and 4.6 g/s (#72 size orifice) is accurate and representative of pump fill operations. The District results, based on a quarter to half turn opening of the FLLG, 74.9 degree Fahrenheit tank temperature, 49% tank fill level, show a standard deviation of 10% – 20%, is representative of typical transfer and dispensing activities that utilize the FLLG. The District Source Test (2008) estimates for gravity fill operations of 2.26 g/s (#54 size orifice) and LPG liquid release rate of 8.94 g/s (#54 size orifice) is accurate and representative.

7. Liquid phase LPG released through the FLLG occurs only during the final moments of a transfer or dispensing activity, and is roughly one second for stationary tanks and portable cylinders and two seconds for cargo tanks.

8. The filling cycle for stationary tanks and portable cylinders varies by pumping rate and receiving vessel size. The estimated typical filling cycles for typical receiving vessels based on staff literature review and communications with industry are representative and accurate.

9. The 2009 sales distribution data by sector as provided by industry for CA and the associated District-wide sales distribution data, estimated based on a roughly 45.5% share as indicated by population is accurate and representative. The relative proportion of District-wide LPG sales for use in internal combustion (i.c.) engines is represented by ARB EMFAC and off-road vehicle inventories, as obtained by industry and is approximately 55.5% of the state-wide total. The following table summarizes the District-wide distribution of LPG sales:

Market Sector	CA Volume Share (%)	CA Volume (mmgal/year)	District Volume (mmgal/year)
Residential		**275.26**	**125.32**
Heating	97.74%	269.04	122.01
RVs	2.26%	6.22	2.83
Commercial		**86.64**	**39.45**
Sales to Retail		**51.94**	**23.65**
Exchange	50.00%	25.97	11.82
On-site Refill	50.00%	25.97	11.82
IC Engines		**67.08**	**30.54**
Forklifts	77.20%	51.78	28.76*
Highway Vehicles	22.80%	15.30	1.78
Industrial		**27.81**	**12.66**
Chemical		**135.58**	**61.73**
Agricultural		**50.47**	**22.98**
Total		**694.66**	**316.07**

* - Fill by gravity represents approximately 30% of the volume, or 8.63 mmgal per year, per WPGA working group membership.

10. The industry provided breakdown of sector related sales and transfer/dispensing breakdown is accurate and representative. The following table summarizes the industry estimated percentages:

Source	Destination	Method	Operation	Share (%)
LPG Production/ Storage*	Terminal	Rail	Offload	30.0%
		Transport (1 tank, comp)	Offload	31.5%
		Transport (tank & trailer, comp)	Offload	31.5%
		Transport (1 tank, pump)	Offload	3.5%
		Transport (tank & trailer, pump)	Offload	3.5%
	Chemical	Rail	Offload	90.0%
		Transport (1 tank, comp)	Offload	4.5%
		Transport (tank & trailer, comp)	Offload	4.5%
		Transport (1 tank, pump)	Offload	0.5%
		Transport (tank & trailer, pump)	Offload	0.5%
Terminal*	Retail Bulk Plant	Transport (1 tank, comp)	Fill	45%
		Transport (tank & trailer, comp)	Fill	45%
		Transport (1 tank, pump)	Fill	5%
		Transport (tank & trailer, pump)	Fill	5%
Retail Bulk Plant	Residential, Heating	Bobtail	Fill	97.7%
	Residential, RV	RV Cylinders	Fill	2.3%
	Commercial	Bobtail	Fill	100%
	Sales to Retail, Exchange	Transport (1 tank, comp)	Fill	45%
		Transport (tank & trailer, comp)	Fill	45%
		Transport (1 tank, pump)	Fill	5%
		Transport (tank & trailer, pump)	Fill	5%
		20# Cylinder	Fill	100%
	Sales to Retail, On-site Fill	Bobtail	Fill	100%
	IC Engines, Forklifts	Forklift Cylinder (40 lb.)	Fill	77.20%
	IC Engines, Highway Vehicles	Highway Vehicle	Fill	22.80%
	Industrial	Transport (1 tank, comp)	Fill	45%
		Transport (tank & trailer, comp)	Fill	45%
		Transport (1 tank, pump)	Fill	5%
		Transport (tank & trailer, pump)	Fill	5%
	Agricultural	Bobtail	Fill	90.00%
		Transport (1 tank, comp)	Fill	4.50%
		Transport (tank & trailer, comp)	Fill	4.50%
		Transport (1 tank, pump)	Fill	0.50%
		Transport (tank & trailer, pump)	Fill	0.50%

* - Includes facilities subject to Rule 1173 and exempt from the proposed rule.

11. The estimated number of filling events associated with LPG transfer and dispensing is based on the average size of the receiving vessel and fill capacity. Because of the safety factor generally applied to LPG tanks and cylinders, the average fill capacity of 80% is used to determine the number of filling events for stationary tanks and

cylinders. The estimated number of filling events associated with LPG transfer and dispensing to bobtails and smaller tanks is expected to be higher because they may contain residual LPG prior to topping off. Based on the CARB study estimate[4], an appropriate average fill capacity of 60% is used to determine the number of filling events for bobtails, small storage tanks and vehicles. The following table summarizes the filling times for various representative cargo tanks and stationary tanks based on the CARB parameters and industry estimates:

Transfer Type	Fill Time (sec)	Tank Volume (gal)	Fill Capacity	Tank Fill Volume (gal)	Fill Rate (gpm)
Bobtail	1,350	3,000	0.6	1,800	80.0
Commercial Tank	240	400	0.6	240	60.0
Residential Tank	180	300	0.6	180	60.0
Transport (1 tank, comp)	6,000	10,000	0.8	8,000	80.0
Transport (1 tank, pump)	6,000	10,000	0.8	8,000	80.0
Transport (tank & trailer, comp)	6,000	10,000	0.8	8,000	80.0
Transport (tank & trailer, pump)	6,000	10,000	0.8	8,000	80.0
20# Cylinder	60	5	0.8	4	Variable
Forklift Cylinder (40 lb)	60	10	0.8	8	Variable
Forklift Cylinder (40 lb) - Gravity Fill	420*	10	0.8	8	Variable

* Field observation of gravity fill time of approximately seven minutes with a No. 54 size orifice. Observed gravity fill time with a No. 72 size orifice exceeded half an hour, and is projected to result in the use of pump fed or cylinder exchange alternatives. Industry estimates range up to ten minutes.

This represents an adjustment to the industry-sponsored study which relied on an assumption that all containers were empty on filling and filled up to 80 percent.

12. The following estimated connector entrapment volumes as determined by the industry sponsored study is representative and accurate:

Transfer Type	Operation	Equipment	Estimated Volume (L)
20# Cylinder	Disconnect	Vapor Line	0.0200
	Fill	Liquid Line HiEff	0.0400
	Fill	Liquid Line	0.1070
Bobtail	Fill	Vapor Line	0.6510
	Fill	Liquid Line	0.6826
	Offload	Liquid Line	0.0200
Commercial Tank	Fill	Liquid Line	0.0260
	Offload	Liquid Line	0.0200
Forklift Cylinder (40 lb)	Disconnect	Vapor Line	0.0200
	Fill	Liquid Line	0.0260
Highway Vehicle	Fill	Liquid Line	0.0200
Residential Tank	Fill	Liquid Line	0.0260
Transport (tank & trailer, pump)	Offload	“Jump Line” (Liquid)	6.4715
	Offload	Liquid Line	7.3006

"Jump Line" is the interconnecting line between the tank and the trailer cargo tanks.
“HiEff” is a high efficiency connection.

ASSUMPTION DIFFERENCES

The following is a summary of the District's adjustments to the industry sponsored study methodology, and are based on follow-up staff discussions as well as literature and field review:

Parameter	Industry Study Methodology Parameter	District Methodology Parameter
1. FLLG Emission Rates	#54 Orifice (Pump Fill): • 0.8 g/s Vapor • 9.3 g/s Liquid	SCAQMD Source Test Results #54 Orifice: Pump-Fill • 2.01 g/s Vapor • 11.3 g/s Liquid Gravity-Fill • 2.26 g/s Vapor • 8.94 g/s Liquid #72 Orifice (Pump Fill): • 0.98 g/s Vapor • 4.6 g/s Liquid
2. FLLG Emission Reduction	70% Overall	50% Overall for Pump Fill >50% For Gravity Fill Switching to Pump Fill or Exchange
3. FLLG Vent Time	All vent times are 60 seconds, independent of fill time.	Vent time is based on fill time.
4. Tank fill events	• Fill events are based on the total sales volume for the sector and targeted receiving vessel. • The number of events is equal to the total sales volume divided by the fill volume. • Fill volume is 80% of the tank size	• Fill events are based on the total sales volume for the sector and targeted receiving vessel. • The number of events is equal to the total sales volume divided by the fill volume. • Fill volume is 80% of the tank size for cylinders and large cargo tanks; 60% for smaller tanks and bobtails.

EMISSION CALCULATIONS

The annual mass amount of LPG emissions associated with use of FLLGs and the disconnections of transfer and dispensing connectors is based on the following calculation:

$$\text{Emissions} = \sum_i \text{Emissions}_{\text{FLLG}} + \sum_i \text{Emissions}_{\text{Disconnects}} \quad (1)$$

Where:

i = Industry Sector
FLLG = Fixed Liquid Level Gauge

Reductions associated with the proposed rule are based on a 50% reduction from FLLG related emissions and the difference between the existing connector entrapment volumes and the LPG low emission connector design value of four cubic centimeters per disconnect, as follows:

$$\text{Reductions} = \sum_i \text{Emissions}_{\text{FLLG}} \times 50\%/100\% + \sum_i \text{Emissions}_{\text{Disconnects}} - \sum_i \text{Emissions}_{\text{LE Disconnects}} \quad (2)$$

Where:

LE = Low Emission

Emissions Calculation Breakdown

FLLG Emissions

FLLG venting releases LPG emissions in both vapor and liquid form:

$$\sum_i \text{Emissions}_{\text{FLLG}} = \sum_i \text{Emissions}_{\text{FLLG, Vapor}} + \sum_i \text{Emissions}_{\text{FLLG, Liquid}} \quad (3)$$

Using the estimated LPG vapor and liquid release rates of 2.01 g/s and 11.3 g/s respectively, as well as the estimated one to two second liquid release per event estimate:

$$\sum_i \text{Emissions}_{\text{FLLG}} = \sum_i 2.01(\text{g/s}) \times (\text{Vent Time})_i + \sum_{i,j} 11.3\,(\text{g/s}) \times 2 \times (\text{No. Vent Events})_{i,j} + \sum_{i,k} 11.3\,(\text{g/s}) \times (\text{No. Vent Events})_{i,k} \quad (4)$$

Where:

j = Cargo Tank Type j

k = Individual Stationary or Portable Tank Type k

Converting grams per second to pounds per minute yields the following:

$$\sum_i \text{Emissions}_{\text{FLLG}} = \sum_i 0.266\,(\text{lb/min}) \times (\text{Vent Time})_i + \sum_{i,j} 2.99\,(\text{lb/min}) \times (\text{No. Vent Events})_{i,j} + \sum_{i,k} 1.49\,(\text{lb/min}) \times (\text{No. Vent Events})_{i,k} \quad (5)$$

Disconnect Emissions

Emissions associated with the disconnection of transfer and dispensing equipment and the release of the entrapped LPG is dependent upon the size of the entrapment space, which varies between different transfer and dispensing options. The annual emissions is proportional to the number of disconnect events, and the mass emissions is dependent on whether the disconnection occurred while LPG was in the vapor or liquid phase, and the associated density at the event temperature and pressure, as follows:

$$\sum_i \text{Emissions}_{\text{Disconnects}} = \sum_{i,l} (\text{Connector Entrapped Vol.})_l \times \rho_l \times (\text{No. Disconnect Events})_l \quad (6)$$

Where:

l = Connector Type l (LPG State, Vessels Connected)

ρ = Density (Vapor or Liquid)

Emission Reduction Calculation Breakdown

FLLG Emission Reductions

As indicated in (2), the reductions from FLLG related emissions are estimated to be 50%:

$$\text{Reductions}_{\text{FLLG}} = \sum_i \text{Emissions}_{\text{FLLG}} \times 50\% / 100\% \quad (7)$$

Disconnect Emission Reductions

As indicated in (2), the reductions from disconnects is based on the difference between existing connector configurations and the LPG low emission connector assemblies:

$$\text{Reductions}_{\text{Disconnect}} = \sum_i \text{Emissions}_{\text{Disconnect}} - \sum_i \text{Emissions}_{\text{LE Disconnect}} \quad (8)$$

Incorporating the emission estimation calculation of (6) into (8) results in the following:

$$\sum_i \text{Reductions}_{\text{Disconnect}} = \sum_{i,l} [(\text{Connector Entrapped Vol.})_l - 4\,\text{mL}] \times \rho_l \times (\text{No. Disconnect Events})_l \quad (9)$$

EMISSION CALCULATION SUMMARIES

Below is an overall summary of the estimated emissions and reductions using the methodology outlined in this appendix:

Sector	WPGA Criteria		District Criteria	
	Emissions (tons/day)	**Reductions (tons/day)**	**Emissions (tons/day)**	**Reductions (tons/day)**
Residential	0.17	0.10	1.47	0.79
Commercial	0.05	0.03	0.47	0.25
Sales to Retail	1.18	0.38	2.03	1.31
IC Engines	0.63	0.55	4.35	3.62
Industrial, Chemical, Agricultural	0.02	0.02	0.18	0.10
Distribution Facilities	0.05	0.04	0.07	0.07
Total:	**2.1**	**1.1**	**8.6**	**6.1**

The following pages summarize the emission calculations and reduction estimates for California using the methodology outlined in this appendix.

[1] Life Cycle Associates, LLC (2011), "Inventory of Fugitive Emissions from LPG Transfers in California, prepared for WPGA,," June 2011 (CONFIDENTIAL).

[2] SCAQMD (2011), "Propane Tank Filling Emissions Reduction Efficiency from Low Emissions #72-Drill Size Self-Cleaning Fixed Maximum Liquid Level Gauges (FMLLGs)," 2011.

[3] Battelle (2009) "Research Investigation on Testing and Evaluation of New Low Emission Fixed Maximum Liquid Level Gauges for Use in LP-Gas Containers, prepared for PERC," September 2009.

[4] CARB (1992) "Determination of Usage Patterns and Emissions for Propane/LPG in California," May 1992.

Summary of California LPG Transfer and Dispensing VOC Emissions and Reduction Estimates

					Activity				Fugitive Emissions		Potential Reductions	
Source	Destination	Method	Operation	Share (%)	Volume (gal x1000)	Volume Per (gal x1000)	Number	Type	Mass Per (g)	Mass (kg)	Mass Per (g)	Mass (kg)
LPG Production/Storage	Terminal	Rail	Offload	30.0%	150,953	24	6,290	Tower Liquid Line	279	1,758	279.42	1,757
LPG Production/Storage	Terminal	Rail	Offload					Tower Vapor Line	274	1,726	274.35	1,726
LPG Production/Storage	Terminal	Transport (1 tank, comp)	Offload	31.5%	158,500	8	19,813	Liquid Line	337	6,667	334.55	6,628
LPG Production/Storage	Terminal	Transport (1 tank, comp)	Offload					Vapor Line	10	198	9.94	197
LPG Production/Storage	Terminal	Transport (tank & trailer, comp)	Offload	31.5%	158,500	8	19,813	Liquid Line	337	6,667	334.55	6,628
LPG Production/Storage	Terminal	Transport (tank & trailer, comp)	Offload					Vapor Line	10	198	9.94	197
LPG Production/Storage	Terminal	Transport (tank & trailer, comp)	Offload					Jump Line	99	1,969	99.32	1,968
LPG Production/Storage	Terminal	Transport (1 tank, pump)	Offload	3.5%	17,611	8	2,201	Liquid Line	3,599	7,923	3,597.22	7,919
LPG Production/Storage	Terminal	Transport (1 tank, pump)	Offload					Vapor Line	10	22	9.94	22
LPG Production/Storage	Terminal	Transport (tank & trailer, pump)	Offload	3.5%	17,611	8	2,201	Liquid Line	3,599	7,923	3,597.22	7,919
LPG Production/Storage	Terminal	Transport (tank & trailer, pump)	Offload					Vapor Line	10	22	9.94	22
LPG Production/Storage	Terminal	Transport (tank & trailer, pump)	Offload					Jump Line	99	219	99.32	219
LPG Production/Storage	Chemical	Rail	Offload	90.0%	122,018	24	5,084	Tower Liquid Line	279	1,421	279.42	1,421
LPG Production/Storage	Chemical	Rail	Offload					Tower Vapor Line	274	1,395	274.35	1,395
LPG Production/Storage	Chemical	Transport (1 tank, comp)	Offload	4.5%	6,101	8	763	Liquid Line	337	257	334.55	255
LPG Production/Storage	Chemical	Transport (1 tank, comp)	Offload					Vapor Line	10	8	9.94	8
LPG Production/Storage	Chemical	Transport (tank & trailer, comp)	Offload	4.5%	6,101	8	763	Liquid Line	337	257	334.55	255
LPG Production/Storage	Chemical	Transport (tank & trailer, comp)	Offload					Vapor Line	10	8	9.94	8
LPG Production/Storage	Chemical	Transport (tank & trailer, comp)	Offload					Jump Line	99	76	99.32	76
LPG Production/Storage	Chemical	Transport (1 tank, pump)	Offload	0.5%	678	8	85	Liquid Line	3,599	305	3,597.22	305
LPG Production/Storage	Chemical	Transport (1 tank, pump)	Offload					Vapor Line	10	1	9.94	1
LPG Production/Storage	Chemical	Transport (tank & trailer, pump)	Offload	0.5%	678	8	85	Liquid Line	3,599	305	3,597.22	305
LPG Production/Storage	Chemical	Transport (tank & trailer, pump)	Offload					Vapor Line	10	1	9.94	1
LPG Production/Storage	Chemical	Transport (tank & trailer, pump)	Offload					Jump Line	99	8	99.32	8
Terminal	Retail Bulk Plant	Transport (1 tank, comp)	Fill	45%	251,588	8	31,448	Liquid Line	337	10,583	334.55	10,521
Terminal	Retail Bulk Plant	Transport (1 tank, comp)	Fill					Vapor Line	10	314	9.94	312
Terminal	Retail Bulk Plant	Transport (1 tank, comp)	Fill					FLLG Vapor	12,060	379,269	6,030.00	189,634
Terminal	Retail Bulk Plant	Transport (1 tank, comp)	Fill					FLLG Liquid	23	711	11.30	355
Terminal	Retail Bulk Plant	Transport (1 tank, comp)	Offload					Liquid Line	337	10,583	334.55	10,521
Terminal	Retail Bulk Plant	Transport (1 tank, comp)	Offload					Vapor Line	10	314	9.94	312
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Fill	45%	251,588	8	31,448	Liquid Line	337	10,583	334.55	10,521
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Fill					Vapor Line	10	314	9.94	312
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Fill					FLLG Vapor	12,060	379,269	6,030.00	189,634
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Fill					FLLG Liquid	23	711	11.30	355
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Offload					Liquid Line	337	10,583	334.55	10,521
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Offload					Vapor Line	10	314	9.94	312
Terminal	Retail Bulk Plant	Transport (tank & trailer, comp)	Offload					Jump Line	99	3,125	99.32	3,124
Terminal	Retail Bulk Plant	Transport (1 tank, pump)	Fill	5%	27,954	8	3,494	Liquid Line	337	1,176	334.55	1,169
Terminal	Retail Bulk Plant	Transport (1 tank, pump)	Fill					Vapor Line	10	35	9.94	35
Terminal	Retail Bulk Plant	Transport (1 tank, pump)	Fill					FLLG Vapor	12,060	42,141	6,030.00	21,070
Terminal	Retail Bulk Plant	Transport (1 tank, pump)	Fill					FLLG Liquid	23	79	11.30	39
Terminal	Retail Bulk Plant	Transport (1 tank, pump)	Offload					Liquid Line	3,599	12,577	3,597.22	12,570
Terminal	Retail Bulk Plant	Transport (1 tank, pump)	Offload					Vapor Line	10	35	9.94	35
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Fill	5%	27,954	8	3,494	Liquid Line	337	1,176	334.55	1,169
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Fill					Vapor Line	10	35	9.94	35
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Fill					FLLG Vapor	12,060	42,141	6,030.00	21,070
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Fill					FLLG Liquid	23	79	11.30	39
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Offload					Liquid Line	3,599	12,577	3,597.22	12,570
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Offload					Vapor Line	10	35	9.94	35
Terminal	Retail Bulk Plant	Transport (tank & trailer, pump)	Offload					Jump Line	99	347	99.32	347
Retail Bulk Plant	Residential, Heating	Bobtail	Fill	97.7%	269,041	1.8	149,467	Liquid Line	337	50,299	334.55	50,004
Retail Bulk Plant	Residential, Heating	Bobtail	Fill					Vapor Line	10	1,494	9.94	1,485
Retail Bulk Plant	Residential, Heating	Bobtail	Fill					FLLG Vapor	2,714	405,579	1,356.75	202,790
Retail Bulk Plant	Residential, Heating	Bobtail	Fill					FLLG Liquid	23	3,378	11.30	1,689
Retail Bulk Plant	Residential, Heating	Bobtail	Offload		269,041	0.18	1,494,671	Liquid Line	10	14,737	7.89	11,790
Retail Bulk Plant	Residential, Heating	Residential Tank	Fill					Liquid Line	13	19,159	10.85	16,211
Retail Bulk Plant	Residential, Heating	Residential Tank	Fill					FLLG Vapor	362	540,772	180.90	270,386
Retail Bulk Plant	Residential, Heating	Residential Tank	Fill					FLLG Liquid	11	16,890	5.65	8,445
Retail Bulk Plant	Residential, RV	RV Cylinders	Fill	2.3%	6,215	0.048	129,483	Liquid Line	13	1,660	10.85	1,404
Retail Bulk Plant	Residential, RV	RV Cylinders	Fill					FLLG Vapor	121	15,616	60.30	7,808
Retail Bulk Plant	Residential, RV	RV Cylinders	Fill					FLLG Liquid	11	1,463	5.65	732
Retail Bulk Plant	Residential, RV	RV Cylinders	Disconnect					Vapor Line	0	40	0.25	32
Retail Bulk Plant	Commercial	Bobtail	Fill	100%	86,639	1.8	48,133	Liquid Line	337	16,198	334.55	16,103
Retail Bulk Plant	Commercial	Bobtail	Fill					Vapor Line	10	481	9.94	478
Retail Bulk Plant	Commercial	Bobtail	Fill					FLLG Vapor	2,714	130,608	1,356.75	65,304
Retail Bulk Plant	Commercial	Bobtail	Fill					FLLG Liquid	23	1,088	11.30	544
Retail Bulk Plant	Commercial	Bobtail	Offload		86,639	0.18	481,328	Liquid Line	10	4,746	7.89	3,797
Retail Bulk Plant	Commercial	Commercial Tank	Fill					Liquid Line	13	6,170	10.85	5,220
Retail Bulk Plant	Commercial	Commercial Tank	Fill					FLLG Vapor	362	174,144	180.90	87,072
Retail Bulk Plant	Commercial	Commercial Tank	Fill					FLLG Liquid	11	5,439	5.65	2,720
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, comp)	Fill	45%	11,687	8	1,461	Liquid Line	337	492	334.55	489
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, comp)	Fill					Vapor Line	10	15	9.94	15
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, comp)	Fill					FLLG Vapor	12,060	17,618	6,030.00	8,809
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, comp)	Fill					FLLG Liquid	23	33	11.30	17
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, comp)	Offload					Liquid Line	337	492	334.55	489
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, comp)	Offload					Vapor Line	10	15	9.94	15
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Fill	45%	11,687	8	1,461	Liquid Line	337	492	334.55	489
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Fill					Vapor Line	10	15	9.94	15
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Fill					FLLG Vapor	12,060	17,618	6,030.00	8,809
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Fill					FLLG Liquid	23	33	11.30	17
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Offload					Liquid Line	337	492	334.55	489
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Offload					Vapor Line	10	15	9.94	15
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, comp)	Offload					Jump Line	99	145	99.32	145
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, pump)	Fill	5%	1,299	8	162	Liquid Line	337	55	334.55	54
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, pump)	Fill					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, pump)	Fill					FLLG Vapor	12,060	1,958	6,030.00	979

					Activity				Fugitive Emissions		Potential Reductions	
Source	Destination	Method	Operation	Share (%)	Volume (gal x1000)	Volume Per (gal x1000)	Number	Type	Mass Per (g)	Mass (kg)	Mass Per (g)	Mass (kg)
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, pump)	Fill					FLLG Liquid	23	4	11.30	2
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, pump)	Offload					Liquid Line	3,599	584	3,597.22	584
Retail Bulk Plant	Sales to Retail, Exchange	Transport (1 tank, pump)	Offload					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Fill	5%	1,299		8 162	Liquid Line	337	55	334.55	54
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Fill					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Fill					FLLG Vapor	12,060	1,958	6,030.00	979
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Fill					FLLG Liquid	23	4	11.30	2
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Offload					Liquid Line	3,599	584	3,597.22	584
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Offload					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Sales to Retail, Exchange	Transport (tank & trailer, pump)	Offload					Jump Line	99	16	99.32	16
Retail Bulk Plant	Sales to Retail, Exchange	20# Cylinder	Fill	100%	25,971		0.004 6,492,625	Liquid Line HiEff	20	128,035	17.75	115,231
Retail Bulk Plant	Sales to Retail, Exchange	20# Cylinder	Disconnect					Vapor Line	0	1,994	0.25	1,595
Retail Bulk Plant	Sales to Retail, On-site Fill	Bobtail	Fill	100%	25,971		1.8 14,428	Liquid Line	337	4,855	334.55	4,827
Retail Bulk Plant	Sales to Retail, On-site Fill	Bobtail	Fill					Vapor Line	10	144	9.94	143
Retail Bulk Plant	Sales to Retail, On-site Fill	Bobtail	Fill					FLLG Vapor	2,714	39,151	1,356.75	19,575
Retail Bulk Plant	Sales to Retail, On-site Fill	Bobtail	Fill					FLLG Liquid	23	326	11.30	163
Retail Bulk Plant	Sales to Retail, On-site Fill	Bobtail	Offload		25,971		0.18 144,281	Liquid Line	10	1,423	7.89	1,138
Retail Bulk Plant	Sales to Retail, On-site Fill	Commercial Tank	Fill					Liquid Line	13	1,849	10.85	1,565
Retail Bulk Plant	Sales to Retail, On-site Fill	Commercial Tank	Fill					FLLG Vapor	362	52,201	180.90	26,100
Retail Bulk Plant	Sales to Retail, On-site Fill	Commercial Tank	Fill					FLLG Liquid	11	1,630	5.65	815
Retail Bulk Plant	Sales to Retail, On-site Fill	20# Cylinder	Fill		25,971		0.004 6,492,625	Liquid Line	53	342,492	50.78	329,689
Retail Bulk Plant	Sales to Retail, On-site Fill	20# Cylinder	Fill					FLLG Vapor	121	783,011	60.30	391,505
Retail Bulk Plant	Sales to Retail, On-site Fill	20# Cylinder	Fill					FLLG Liquid	11	73,367	5.65	36,683
Retail Bulk Plant	Sales to Retail, On-site Fill	20# Cylinder	Disconnect					Vapor Line	0	1,994	0.25	1,595
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)-Gravity	Fill		15,535		0.008 1,941,819	Liquid Line	13	24,890	10.85	21,061
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)-Gravity	Fill					FLLG Vapor	972	1,887,059	911.50	1,769,968
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)-Gravity	Fill					FLLG Liquid	9	17,360	4.47	8,680
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)-Gravity	Disconnect					Vapor Line	0	596	0.25	477
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)	Fill	77.20%	36,247		0.008 4,530,910	Liquid Line	13	58,077	10.85	49,142
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)	Fill					FLLG Vapor	121	546,428	60.30	273,214
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)	Fill					FLLG Liquid	11	51,199	5.65	25,600
Retail Bulk Plant	IC Engines, Forklifts	Forklift Cylinder (40 lb)	Disconnect					Vapor Line	0	1,392	0.25	1,113
Retail Bulk Plant	IC Engines, Highway Vehicles	Highway Vehicle	Fill	22.80%	15,295		0.018 849,732	Liquid Line	10	8,378	7.89	6,703
Retail Bulk Plant	Industrial	Transport (1 tank, comp)	Fill	45%	12,513		8 1,564	Liquid Line	337	526	334.55	523
Retail Bulk Plant	Industrial	Transport (1 tank, comp)	Fill					Vapor Line	10	16	9.94	16
Retail Bulk Plant	Industrial	Transport (1 tank, comp)	Fill					FLLG Vapor	12,060	18,863	6,030.00	9,431
Retail Bulk Plant	Industrial	Transport (1 tank, comp)	Fill					FLLG Liquid	23	35	11.30	18
Retail Bulk Plant	Industrial	Transport (1 tank, comp)	Offload					Liquid Line	337	526	334.55	523
Retail Bulk Plant	Industrial	Transport (1 tank, comp)	Offload					Vapor Line	10	16	9.94	16
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Fill	45%	12,513		8 1,564	Liquid Line	337	526	334.55	523
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Fill					Vapor Line	10	16	9.94	16
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Fill					FLLG Vapor	12,060	18,863	6,030.00	9,431
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Fill					FLLG Liquid	23	35	11.30	18
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Offload					Liquid Line	337	526	334.55	523
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Offload					Vapor Line	10	16	9.94	16
Retail Bulk Plant	Industrial	Transport (tank & trailer, comp)	Offload					Jump Line	99	155	99.32	155
Retail Bulk Plant	Industrial	Transport (1 tank, pump)	Fill	5%	1,390		8 174	Liquid Line	337	58	334.55	58
Retail Bulk Plant	Industrial	Transport (1 tank, pump)	Fill					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Industrial	Transport (1 tank, pump)	Fill					FLLG Vapor	12,060	2,096	6,030.00	1,048
Retail Bulk Plant	Industrial	Transport (1 tank, pump)	Fill					FLLG Liquid	23	4	11.30	2
Retail Bulk Plant	Industrial	Transport (1 tank, pump)	Offload					Liquid Line	3,599	625	3,597.22	625
Retail Bulk Plant	Industrial	Transport (1 tank, pump)	Offload					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Fill	5%	1,390		8 174	Liquid Line	337	58	334.55	58
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Fill					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Fill					FLLG Vapor	12,060	2,096	6,030.00	1,048
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Fill					FLLG Liquid	23	4	11.30	2
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Offload					Liquid Line	3,599	625	3,597.22	625
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Offload					Vapor Line	10	2	9.94	2
Retail Bulk Plant	Industrial	Transport (tank & trailer, pump)	Offload					Jump Line	99	17	99.32	17
Retail Bulk Plant	Agricultural	Bobtail	Fill	90.00%	45,419		1.8 25,233	Liquid Line	337	8,491	334.55	8,442
Retail Bulk Plant	Agricultural	Bobtail	Fill					Vapor Line	10	252	9.94	251
Retail Bulk Plant	Agricultural	Bobtail	Fill					FLLG Vapor	2,714	68,470	1,356.75	34,235
Retail Bulk Plant	Agricultural	Bobtail	Fill					FLLG Liquid	23	570	11.30	285
Retail Bulk Plant	Agricultural	Bobtail	Offload					Liquid Line	10	249	7.89	199
Retail Bulk Plant	Agricultural	Transport (1 tank, comp)	Fill	4.50%	2,271		8 284	Liquid Line	337	96	334.55	95
Retail Bulk Plant	Agricultural	Transport (1 tank, comp)	Fill					Vapor Line	10	3	9.94	3
Retail Bulk Plant	Agricultural	Transport (1 tank, comp)	Fill					FLLG Vapor	12,060	3,423	6,030.00	1,712
Retail Bulk Plant	Agricultural	Transport (1 tank, comp)	Fill					FLLG Liquid	23	6	11.30	3
Retail Bulk Plant	Agricultural	Transport (1 tank, comp)	Offload					Liquid Line	337	96	334.55	95
Retail Bulk Plant	Agricultural	Transport (1 tank, comp)	Offload					Vapor Line	10	3	9.94	3
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Fill	4.50%	2,271		8 284	Liquid Line	337	96	334.55	95
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Fill					Vapor Line	10	3	9.94	3
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Fill					FLLG Vapor	12,060	3,423	6,030.00	1,712
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Fill					FLLG Liquid	23	6	11.30	3
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Offload					Liquid Line	337	96	334.55	95
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Offload					Vapor Line	10	3	9.94	3
Retail Bulk Plant	Agricultural	Transport (tank & trailer, comp)	Offload					Jump Line	99	28	99.32	28
Retail Bulk Plant	Agricultural	Transport (1 tank, pump)	Fill	0.50%	252		8 32	Liquid Line	337	11	334.55	11
Retail Bulk Plant	Agricultural	Transport (1 tank, pump)	Fill					Vapor Line	10	0	9.94	0
Retail Bulk Plant	Agricultural	Transport (1 tank, pump)	Fill					FLLG Vapor	12,060	380	6,030.00	190
Retail Bulk Plant	Agricultural	Transport (1 tank, pump)	Fill					FLLG Liquid	23	1	11.30	0
Retail Bulk Plant	Agricultural	Transport (1 tank, pump)	Offload					Liquid Line	3,599	114	3,597.22	113
Retail Bulk Plant	Agricultural	Transport (1 tank, pump)	Offload					Vapor Line	10	0	9.94	0
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Fill	0.50%	252		8 32	Liquid Line	337	11	334.55	11
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Fill					Vapor Line	10	0	9.94	0
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Fill					FLLG Vapor	12,060	380	6,030.00	190
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Fill					FLLG Liquid	23	1	11.30	0
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Offload					Liquid Line	3,599	114	3,597.22	113
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Offload					Vapor Line	10	0	9.94	0
Retail Bulk Plant	Agricultural	Transport (tank & trailer, pump)	Offload					Jump Line	99	3	99.32	3

APPENDIX C. RECORDKEEPING AND REPORTING

RECORDKEEPING AND REPORTING REQUIREMENTS

Proposed Rule 1177 contains both recordkeeping and reporting requirements. This appendix summarizes the requirements and provides sample templates for affected facilities to use.

Below is an excerpt from Table 1 of the Draft Staff Report that includes a breakdown of the recordkeeping and reporting requirements:

Requirement	Bulk Loading Facility	Transfer and Dispensing Facility	
		Offers LPG for Sale to End User	Other
Recordkeeping			
- LE FLLG Installations - LPG LE Connector Installations	By Jan 1, 2013		
- Leak Repairs	Effective Jan 1, 2013		N/A
- Vapor Recovery or Equalization System Maintenance Records	By Jan 1, 2013	N/A	
Reporting (Annual)			
- LPG Purchase and Dispensing Month-to-Month	By Jul 1, 2014, 2015, 2016§		N/A
- Inventory of LPG Containers and Associated FLLGs	By Jul 1, 2014, 2015, 2016, 2017, 2018	N/A	N/A
- End of Year Inventory of LPG Low Emission Connectors and Associated Equipment	By Jul 1, 2014	N/A	N/A

§ LPG transfer and dispensing facilities that offer LPG for sale to an end user may satisfy the reporting requirement by arranging to have their LPG suppliers identify and include their facility's LPG purchases with the supplier's annual report. The supplier shall also notify the facility and the District by March 1 of the reporting year in order to satisfy the reporting requirement.

SAMPLE TEMPLATES

The following table summarizes the sample templates contained in this appendix. Facilities should use these templates, or an equivalent approved by the Executive Officer, for required submittals. Because the required submittals primarily contain information maintained for recordkeeping purposes, many of the report templates can also be used for record logs, as noted.

Report Requirement	Report Submittal Deadline				
	July 1 2014	July 1 2015	July 1 2016	July 1 2017	July 1 2018
	For Calendar Year				
	2013	2014	2015	2016	2017
(g)(1) - Purchase and Sales Volume* (g)(2) Supplier Customer List Report**	√	√	√		
(g)(~~2~~3) - Connector End of Year Inventory*	√				
(g)(~~3~~4) - FLLG End of Year Inventory*	√	√	√	√	√
General Information	√	√	√	√	√
Confidential Information Designation	√	√	√	√	√

* The report form templates may also be used for recordkeeping.

** LPG suppliers that are reporting on behalf of customers that would otherwise report per (g)(1) shall include a list of the covered customers as part of the annual report submittal.

South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765
(909) 396-2000

RULE 1177 ANNUAL REPORT
GENERAL INFORMATION

Calendar Year: _____ **SCAQMD Facility ID (If Applicable):** _____

Legal Company Name:	
Facility Name:	
Facility Location:	
Company Mailing Address:	

Contact Person:		**Title:**	
Phone:		**Fax:**	
Email:			

Sign below to certify that all information submitted in the Annual Retrofit Report is true and correct.

_____ _____

Printed Name of Responsible Party **Signature of Responsible Party**

_____

Date

FORM R1177 - GI

South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765
(909) 396-2000

RULE 1177 ANNUAL LPG REPORT
EXEMPT FROM DISCLOSURE DESIGNATION

Calendar Year: _____

SCAQMD Facility ID (If Applicable): _____

Facility Name: _____

Facility Location: _____

Report Form	Please indicate which information is EXEMPT FROM DISCLOSURE by checking the box below
Monthly LPG Purchase And Sales Volumes (Form R1177-1) *(Due July 1 2014, 2015, 2016)**	☐
LPG Supplier Customer Report List (Form R1177-1S)† *(Due July 1 2014, 2015, 2016)**	☐
Connector End of Year Inventory (Form R1177-2) *(Due July 1 2014)‡*	☐
Container and FLLG End of Year Inventory (Form R1177-3) *(Due July 1 2014, 2015, 2016, 2017, 2018)**	☐

* = For Prior Calendar Year
† = Optional form for suppliers to list LPG customers for whom LPG sales to end users are included as part of the supplier's submitted LPG purchase and sales volume report.
‡ = For Calendar Year 2013

Pursuant to the California Public Records Act, your information and data are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as trade secret, production data, or other qualification, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such a claim at the time of submittal to the District.

FORM R1177 - EDD

South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765
(909) 396-2000

RULE 1177 ANNUAL LPG REPORT
LPG PURCHASE AND SALES

Due by July 1 Following Each Calendar Year for 2013, 2014 and 2015

SCAQMD Facility ID (If Applicable): _____

Facility Name: _____

Calendar Year: _____

Facility Location: _____

Month	Purchase Volumes (gal)		Sales Volumes (gal)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

FORM R1177 - 1

South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765
(909) 396-2000

RULE 1177 ANNUAL LPG REPORT
LPG SUPPLIER CUSTOMER REPORT LIST

Due by July 1 Following Each Calendar Year for 2013, 2014 and 2015

SCAQMD Facility ID (If Applicable): _____

Facility Name: _____

Calendar Year: _____

Facility Location: _____

#	Facility Name, Address	#	Facility Name, Address

Use additional forms as needed.

Page ___ of ___

FORM R1177 – 1S

South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765
(909) 396-2000

RULE 1177 ANNUAL LPG REPORT
CONNECTOR END OF YEAR INVENTORY

Due by July 1, 2014 For Calendar Year 2013

SCAQMD Facility ID (If Applicable): _____

Facility Name: _____

Facility Location: _____

Calendar Year: _____

Identify Equipment Connected To (Bobtail, Tanker Truck, Stationary Tank, etc.)	LPG Low Emission Connector Description		
	Manufacturer	Part or Identification Number	Number of LPG Low Emission Connectors

FORM R1177 - 2

South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765
(909) 396-2000

RULE 1177 ANNUAL REPORT
CONTAINER AND FLLG END OF YEAR INVENTORY

Due by July 1 Following Each Calendar Year for 2013, 2014, 2015, 2016 and 2017

SCAQMD Facility ID (If Applicable): _____

Facility Name: _____

Calendar Year: _____

Facility Location: _____

Container Type	Container Sizes (Gal)	No. of Containers	No. of Low Emission FLLGs Installed	Total No. of FLLGs (If Different than No. Containers)
Residential	<250			
	250 - 500			
	>500			
Commercial	<250			
	250 - 500			
	>500 - 1,000			
	>1,000 - 1,150			
	>1,150			
Portable, Forklift				
Portable, Non-Forklift				
Bobtail/Tanker Truck				
Other				

Total No. of FLLGs: _____

Total No. of Low Emission FLLGs: _____

FORM R1177 - 3

ATTACHMENT G

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Environmental Assessment for Proposed Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing

May 2012

SCAQMD No. 03302012BAR
State Clearinghouse No: 2012041008

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	William Wong	Principal Deputy District Counsel

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

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Speaker of the Assembly Appointee

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County of Los Angeles

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Cities of Los Angeles County/Eastern Region

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County of Orange

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Councilmember, Ninth District
City of Los Angeles

MIGUEL A. PULIDO
Mayor, Santa Ana
Cities of Orange County

EXECUTIVE OFFICER:
BARRY R. WALLERSTEIN, D.Env.

PREFACE

This document constitutes the Final Environmental Assessment (EA) for Proposed Rule (PR) 1177 – Liquefied Petroleum Gas Transfer and Dispensing. The Draft EA was released for a 30-day public review and comment period from April 3, 2012 to May 2, 2012. One comment letter was received from the public on the Draft EA. This comment letter, along with responses to the comments, is included in Appendix C of this document.

Subsequent to release of the Draft EA, minor modifications were made to PR 1177. To facilitate identification, modifications to the document are included as underlined text and text removed from the document is indicated by ~~strikethrough~~. Staff has reviewed the modifications to PR 1177 and concluded that none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15073.5. Therefore, this document now constitutes the Final EA for PR 1177.

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CHAPTER 1

PROJECT DESCRIPTION

INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin referred to herein as the district. By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all federal and state ambient air quality standards for the district[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[3]. The 2007 AQMP concluded that major reductions in emissions of particulate matter (PM), oxides of sulfur (SOx) and oxides of nitrogen (NOx) are necessary to attain the state and national ambient air quality standards for ozone, particulate matter with an aerodynamic diameter of 10 microns or less (PM10) and particulate matter with an aerodynamic diameter of 2.5 microns or less (PM2.5). More emphasis is placed on NOx and SOx emission reductions because they provide greater ozone and PM emission reduction benefits than volatile organic compound (VOC) emission reductions. VOC emission reductions, however, continue to be necessary, especially to assist with achieving the ozone and PM2.5 ambient air quality standards. PR 1177 would partially implement 2007 AQMP Control Measure CM #2007 MCS-07 – Application of All Feasible Measures, to reduce fugitive emissions of VOCs from the transfer and dispensing of LPG, as explained in more detail below.

Ozone, a criteria pollutant, is formed when NOx and VOCs react in the atmosphere and has been shown to adversely affect human health. The federal one-hour[4] and eight-hour ozone standards were exceeded in all four counties and in the Salton Sea Air Basin in 2010. The Central San Bernardino Mountain area recorded the greatest number of exceedences of the one-hour state standard (52 days), eight-hour state standard (101 days), and eight-hour federal standard (74 days). However, none of the four counties had health advisory days in 2010. Altogether, in 2010, the South Coast Air Basin exceeded the federal eight-hour ozone standard on 102 days, the state one-hour ozone standard on 79 days, and the state eight-hour ozone standard on 131 days.

In May 1992, the California Air Resources Board (CARB) conducted a study to determine the usage patterns of liquefied petroleum gas (LPG) which is classified as a VOC, and to estimate emissions resulting from the transfer operations for the entire state of California. This effort was the first attempt to quantify LPG transfer emissions in California and the study found that total emissions were estimated to be 1,131 tons per year (3.11 tons per day) or the equivalent of 464,000 gallons of LPG emitted as fugitive VOCs. LPG emissions identified in the CARB survey were based on 722 million gallons of LPG transferred in California. The CARB survey also relied upon data provided by the National Propane Gas Association (NPGA). The report also concluded that fugitive LPG emissions from the fixed liquid level gauge (FLLG), a liquid level indicator relied upon to indicate when the tank reaches capacity during filling operations, were just as substantial as emissions from filling line disconnections. Under CARB's Innovative Clean Air Technologies (ICAT) grant program, in 2006, the Adept Group Inc. evaluated and recommended methods to reduce fugitive VOC emissions from FLLGs during LPG tank filling

[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health and Safety Code, §§40400-40540).
[2] Health and Safety Code, §40460 (a).
[3] Health and Safety Code, §40440 (a).
[4] The federal one-hour ozone standard was replaced by the federal eight-hour ozone standard, effective June 15, 2005.

operations. Subsequently, the District, in partnership with the Western Propane Gas Association (WPGA), conducted a review of the areawide emissions inventory, including a series of source tests to quantify FLLG emission rates. The updated operating parameters and emission rates resulted in a revised emission inventory of 8.6 tons of VOC per day within the district.

The 2007 AQMP, Control Measure CM#2007 MCS-07 – Application of All Feasible Measures, contains unspecified VOC reduction goals. Further, the California Clean Air Act (CCAA) requires districts to achieve and maintain state standards by the earliest practicable date and for extreme non-attainment areas, to include all feasible measures pursuant to the Health and Safety Code §§40913, 40914, and 40920.5. The term "feasible" is defined in the Title 14 of the California Code of Regulations, §15364, as a measure "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

Based on CARB's study, the subsequent evaluation and recommendations made by the Adept Group Inc. relative to LPG emissions, the development of low emission FLLGs and connectors, and the general VOC reduction goals in the 2007 AQMP, PR 1177 – Liquefied Petroleum Gas Transfer and Dispensing, would partially implement Control Measure CM #2007 MCS-07 – Application of All Feasible Measures, to reduce fugitive emissions of VOCs from the transfer and dispensing of LPG. The processes contributing to these emissions include delivery and transfer of LPG to residential, industrial and commercial users, fueling stations and cylinder refueling. PR 1177 would apply to the transfer of LPG to and from stationary storage tanks, ~~and~~ cargo tanks (~~,~~ including bobtails, tanker trucks and rail tank cars), and cylinders, and the transfer of LPG into portable refillable tanks. Upon full implementation, the anticipated emission reductions of VOCs from implementing PR 1177 are estimated at 6.1 tons per day at full implementation.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PR 1177 is a discretionary action by a public agency, which has potential for resulting in direct or indirect changes to the environment and, therefore, is considered a "project" as defined by the California Environmental Quality Act (CEQA). SCAQMD is the lead agency for the proposed project and has prepared this Final ~~draft~~ environmental assessment (EA) with no significant adverse impacts pursuant to its Certified Regulatory Program and SCAQMD Rule 110. California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report or negative declaration once the Secretary of the Resources Agency has certified the regulatory program. SCAQMD's regulatory program was certified by the Secretary of the Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110.

CEQA and Rule 110 require that potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of CEQA, the SCAQMD has prepared this Final ~~draft~~ EA to address the potential adverse environmental impacts associated with the proposed project. The Final ~~draft~~ EA is a public disclosure document intended to: (a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental effects of the proposed project; and, (b) be used as a tool by decision makers to facilitate decision making on the proposed project.

SCAQMD's review of the proposed project shows that PR 1177 would not have a significant adverse effect on the environment. Because PR 1177 will have no statewide, regional or areawide significance, no CEQA scoping meeting was required to be held for the proposed project pursuant to Public Resources Code §21083.9(a)(2). Further, pursuant to CEQA Guidelines §15252, since no significant adverse impacts were identified, no alternatives or mitigation measures are required to be included in this Final ~~draft~~ EA. The analysis in Chapter 2 supports the conclusion of no significant adverse environmental impacts.

One comment letter was received relative to the analysis prepared in the Draft EA during the 30-day public review period (from April 3, 2012 to May 2, 2012). This comment letter, along with responses to the comments, is included in Appendix C of this document. Prior to making a decision on the proposed rule, the SCAQMD Governing Board must review and certify that the Final EA complies with CEQA as providing adequate information on the potential adverse environmental impacts of the proposed rule. None of the comments in the letter alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. ~~Comments received on the Draft EA during the public comment period and responses to comments will be prepared and included in the Final EA for the proposed project.~~

PROJECT LOCATION

PR 1177 would reduce fugitive VOC emissions from the transfer and dispensing of LPG at facilities, not otherwise subject to SCAQMD Rule 1173 - Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Refineries and Chemical Plants, throughout the SCAQMD's jurisdiction. The SCAQMD has jurisdiction over an area of 10,473 square miles, consisting of the four-county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB) referred to hereafter as the district. The Basin, which is a subarea of the district, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal non-attainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 1-1).

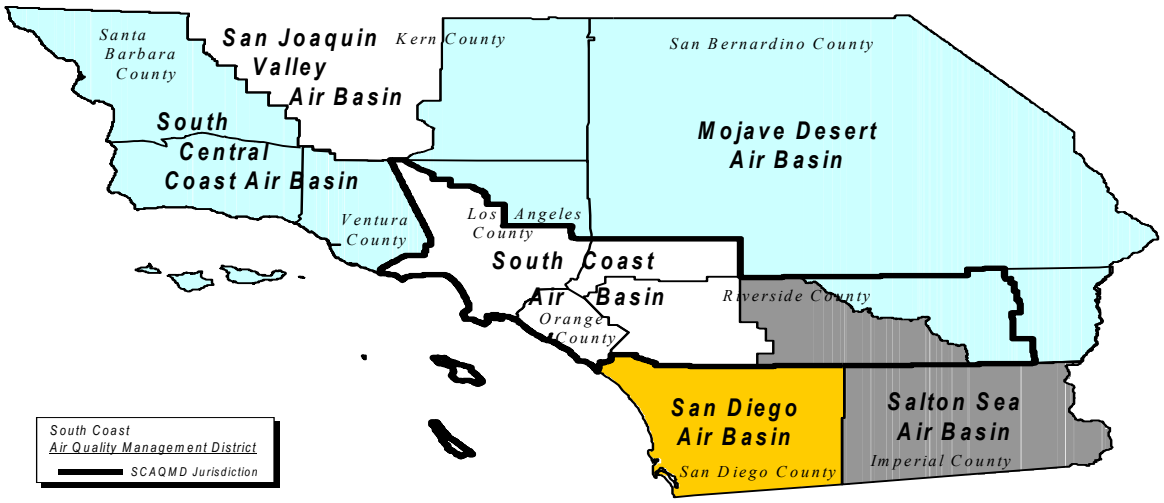

Figure 1-1
Boundaries of the South Coast Air Quality Management District

PROJECT OBJECTIVES

The project objectives of the proposed project include the following. One objective is to implement, in part, 2007 AQMP Control Measure CM#2007 MCS-07 to assist the SCAQMD in its efforts to attain and maintain all state and federal ozone and PM ambient air quality standards. The main objective of PR 1177, however, is to reduce fugitive VOC emissions during the transfer and dispensing of LPG at facilities not otherwise subject to SCAQMD Rule 1173. PR 1177 would target processes contributing to these emissions, including delivery and transfer of LPG to residential, industrial and commercial users, fueling stations and cylinder refueling. Specifically, PR 1177 would apply to the transfer of LPG to and from stationary storage tanks, ~~and~~ cargo tanks (~~,~~ including bobtails, tanker trucks and rail tank cars), and cylinders, and the transfer of LPG into portable tanks.

PROJECT BACKGROUND

LPG Properties

LPG is a petroleum product composed predominantly of any of the following hydrocarbons or mixtures thereof: propane, propylene, butanes (normal or isobutane) and to a lesser extent butylenes, and is classified as a VOC. Although consisting mainly of propane and butane, in some parts of the country, propane itself is commonly referred to as LPG. Unlike gasoline, which is a liquid under normal or standard temperatures and atmospheric conditions (pressure), LPG is a vapor under similar conditions, and must be stored and transported in closed containers under pressure to retain its liquefied state. LPG may also be refrigerated to reduce the pressure at which it has to be stored.

LPG is colorless and odorless and about 1.5 times as heavy as air in the vapor state. Therefore, in general it is necessary, as a fire and safety precaution, to contain an odorant in order to warn

users of its presence in the event of leaks. Organosulfur compounds are usually used for this purpose with the most common odorant being ethyl mercaptan. Most states require a minimum of one pound of odorant to be injected into 10,000 gallons of LPG loaded. In addition, LPG is classified by the National Fire Protection Association (NFPA) as a flammable gas and as an extremely flammable liquid (fire rating = 4)[5]. Due to the flammability of LPG, proper handling and storage of LPG is also regulated by the Department of Transportation (DOT) and the Occupational Safety and Health Administration (OSHA) as a hazardous material.

Because, LPG is typically sold as a liquid, it is metered and paid for on a per volume basis in accordance with standards mandated by the Bureau of Weights and Measures. Thus, the task of transferring LPG from storage containers in a liquid state needs to be accomplished under normal atmospheric conditions, but at operating pressures higher than atmospheric through the use of pumps or vapor compressors in a closed system. In order for LPG to remain in a liquid state when transferred, operating pressure cannot be compromised. Thus, maintaining a closed, pressurized system serves to reduce fire and safety risks as well as creates an incentive that ensures that the customer is paying for product that is actually transferred rather than paying for lost product.

The properties of LPG are unique because LPG can be stored and easily (and more cheaply) transported in a liquid state and used later in a gaseous state. Most commercial and industrial applications require LPG to be converted from a liquid state to a gaseous state and this is readily accomplished by lowering the operating pressure to atmospheric conditions. The advantage obtained from reduced transportation costs associated with liquefied LPG is sufficient to offset the cost of actually liquefying and maintaining the LPG in a liquid state. Lastly, LPG burns relatively cleanly, resulting in lower greenhouse gas (GHG) emissions than most other fossil fuels when measured on a total fuel cycle[6].

LPG Applications

LPG has multiple uses in numerous applications ranging from cooking, heating, air conditioning and transportation, as well as industrial uses where LPG can be used as a fuel in metallurgical plants or as a standby fuel. In some cases LPG is used as a chemical feedstock at manufacturing plants, and is also available for use in motor vehicles, where it is commonly referred to as autogas, although its introduction to the motor vehicle fuel market has thus far been limited.

From the point of LPG production either from natural gas processing or crude oil refining to where the product reaches the end user, LPG is bought, sold, transported or distributed by wholesalers and refiners, retail bulk plants and other functions to be utilized in multiple applications. The facilities and operations affected by PR 1177 are mainly represented by two Standard Industrial Classification (SIC) codes, 4925 - Mixed, Manufactured, or LPG Production and/or Distribution [North American Industry Classification System (NAICS) - no NAICS equivalent] and 5984 - LPG (Bottled Gas) Dealers [NAICS 454312]. However, processes not represented by either SIC code, but which include the transfer or dispensing of LPG, may still be subject to the requirements in PR 1177 and will be evaluated on an individual basis to determine

[5] NFPA Flammability Rating: 0 = Not Combustible; 1 = Combustible if heated; 2 = Caution: Combustible liquid flash point of 100° F to 200°F; 3 = Warning: Flammable liquid flash point below 100°F; 4 = Danger: Flammable gas or extremely flammable liquid

[6] Energetics, "Propane Reduces Greenhouse Gas Emissions – A Comparative Analysis," p. 3, 2009.

rule applicability. The following discussion describes the various LPG usage categories and the specific applications in each category.

Industrial: Industrial applications of LPG usage occur in manufacturing plants where the LPG is used as fuel for standby equipment, space heating, and flame cutting and metallurgical furnaces.

Commercial: Commercial applications of LPG usage typically occur at facilities such as motels and restaurants where LPG is utilized for space heating, water heating, cooking and laundering. The commercial category also includes sales of LPG to bottle fillers, campgrounds, and hardware stores.

Residential: In California and the district, residential LPG usage accounted for the largest market share of LPG sales. Typically, residential LPG is distributed in areas where there is a lack of infrastructure for distributing natural gas. Residential customers use LPG for space heating, indoor and outdoor cooking, water heating, swimming pool heating, clothes drying, lighting and cooling. Recreational vehicle (RV) fueling is also included in the residential market category and LPG is used in RVs for power generation, heating and refrigeration.

Chemical: The chemical market segment in the district accounts for only 20 percent of total LPG sales. LPG is sold to the petrochemical industry where it is used as a raw material in various chemical processes. Some typical products manufactured from LPG include ethylene, benzene, toluene, xylene, and methanol which are feed chemicals for manufacturing polymers and other specialty chemicals.

Internal Combustion Engine Fuel: The majority of LPG in this category is used as forklift fuel because VOC emissions from propane combustion are much less than if diesel or gasoline was used to fuel the forklifts. For this reason, LPG-fueled forklifts are widely used inside warehouses. In addition, LPG is also commonly used for fueling internal combustion engines that run highway vehicles, and oil field drilling and production equipment.

Agricultural: Agricultural use of LPG on farms accounts for about seven percent of total sales in the district. LPG is used by the farming industry for fueling tractors, irrigation engines, standby electric generators, space heaters in buildings (including farm houses). LPG is also used for cooking, crop drying, tobacco curing, poultry, and other related agricultural applications.

Sales to Retail: Wholesalers of LPG supply retail locations where 20-pound cylinder filling occurs such as dispensing stations or hardware stores which conduct LPG cylinder sales as part of exchange programs. An exchange program is when a customer brings in an empty portable LPG cylinder, and exchanges it for a full replacement cylinder. Exchange program cylinders are filled by weight at bulk loading facilities using an automated system and then delivered by trucks to exchange sites so that no LPG filling activities occur at the retail sites.

LPG Transportation Activities and Transfer Methods

There are three main ways that LPG is transported: 1) via railroad tank cars; 2) via tanker trucks; and, 3) via bobtail trucks. Depending on which way the LPG is transported, the transfer and dispensing method will vary according to the type of transportation involved. The following discussion describes each transportation activity and its corresponding transfer method.

Railroad Tank Car: Railroad tank cars deliver LPG to bulk plant unloading stations in very large quantities. Railroad tank cars are by far the largest DOT tanks that transport LPG, ranging in size from 4,000 gallons water capacity to 45,000 gallons water capacity. Each railroad tank car that transports LPG is equipped with fittings and valves enclosed in a protective dome that is located on the top of the cargo tank. There are valves, including the emergency shut-off valve, housed in the dome on the top of the railroad tank car. Also included in the dome area are liquid and vapor hose connections which connect to the plant piping system to allow the transfer of LPG from the railroad tank car to different locations within the plant. The sizes of railroad tank cars observed in the district range from 30,000 gallons water capacity to 34,000 gallons water capacity and railroad tank cars in this size range can be emptied within 45 minutes to one hour with the use of a compressor or pump.

A typical LPG railroad tank car has openings only on the top and none on the bottom. Unloading racks or stations have a ladder and platform that provide access to a manway on the railroad tank car, which provides access to the valves within the dome. Because railroad tank cars are not equipped with their own pumps or compressors, loading and offloading of product is accomplished via liquid and vapor hose connections each equipped with an emergency shutoff valve, that connect directly to the bulk plant's piping and pumping system. Multiple tank cars may be loaded or unloaded without moving the cars.

During offloading, the bulk plant's liquid pump cannot fully empty all of the LPG from the railroad tank car. Typically, there is a small amount of LPG left in the railroad tank car that is referred to as the "liquid heel." In addition, even if most of the liquid may be pumped out of the railroad tank car, the tank would still contain vapors in the air space above the liquid level left in the tank. These remaining vapors may have the equivalent of as much as three percent of the tank's capacity.

A compressor is equipped with a four-way valve system that can be used to facilitate the transfer of LPG from the railroad tank car to the bulk plant's stationary storage tank. In order to move liquid LPG product from the railroad tank car to the stationary storage tank, the vapor portion of the LPG in the stationary storage tank is drawn into the compressor through the vapor line and is slightly compressed. The compressed vapor then enters the top of the railroad tank car, thereby increasing the pressure in the railroad tank car and inversely reducing the pressure in the stationary storage tank. This difference in pressure between the railroad tank car and the stationary storage tank will cause the liquid to move through the separate liquid line from the railroad tank car into the stationary storage tank.

Once all of the liquid has been removed from the railroad tank car, the compressor four-way valve system setting is rotated 90 degrees to allow the vapor flow to change direction, thereby pulling vapors from the top of the railroad tank car and discharging them back into the liquid section of the stationary storage tank. This reversal of direction will prevent excessive pressure build up in the stationary storage tank. When this process is complete, the liquid line valve is placed in the closed position. The existing liquid in the stationary storage tank will condense the returned vapor into additional liquid. The goal of this process is to facilitate the movement of the vapors and condense them into liquid form in such a way that the changes in pressure in the two vessels are gradual.

Tanker Truck: Tanker trucks, also referred to as truck transports, are another way LPG can be delivered. Tanker trucks transporting LPG typically have a water capacity of approximately 10,000 gallons. Because of their size, tanker trucks deliver LPG to facilities that have a substantial storage capacity such as bulk loading facilities, including industrial sources or chemical plants.

To unload a tanker truck, the liquid line from the tanker truck is connected to the liquid line of the storage tank. Similarly, vapor lines from the tanker truck and the storage tank are also connected, thereby forming a closed loop vapor return/equalization system that promotes the efficient transfer of LPG from the tanker truck to the storage tank.

Unlike railroad tank cars, tanker trucks are equipped with either a pump or a compressor that is used during the LPG offloading process. However, using a compressor is preferred over a pump because it is more effective in facilitating a more complete transfer of liquid LPG from the tanker truck to the storage tank via the transfer lines. If a pump is used to offload the tanker truck, the transfer of LPG is not as complete because the hose of the liquid line may have some retention of residual liquid in it.

Bobtail Truck: Bobtail trucks are the third way LPG is transported to its customers. A bobtail truck is much smaller than a tanker truck such that a bobtail truck has a water capacity in the range of 2,500 gallons to 3,000 gallons. Due to their smaller size, bobtail trucks are used to transport smaller volumes of LPG to residential, industrial (for forklift tank fueling), commercial and retail sales facilities. These facilities tend to store relatively small amounts (less than 10,000 gallons) of LPG. For example, a bobtail truck can make multiple deliveries with one truck load of LPG to both residential and commercial customers, since residential tanks are typically sized between approximately 150 gallons water capacity and 500 gallons water capacity and commercial tanks can be as large as 1,000 gallons water capacity.

Unlike a tanker truck, a bobtail truck does not have a vapor return/equalization line. However, a bobtail truck is equipped with a pump that transfers LPG to the customer's storage tank via an extended hose line. Upon completion of the transfer process, the hose is disconnected and rolled back onto a spool at the end of the truck.

Also, unlike a tanker truck, when a bobtail truck is loaded with LPG, the bobtail truck is equipped with a FLLG which may be opened to varying degrees either intermittently or continuously, depending on operator practice. Opening of the FLLG ensures that the product (LPG) in the tank remains at a safe level during filling. The bobtail truck's cargo tank usually has a separate gauge that indicates the LPG volume, and an operator will usually determine that a tank is filled when liquid level is somewhere in the range of 80 to 87 percent capacity depending on the season, temperature or the period of time that the LPG is allowed to remain in the cargo tank before delivery.

LPG Storage

LPG storage can occur in portable storage cylinders or in stationary storage tanks. The following paragraphs describe each type of LPG storage.

Cylinders: Propane cylinders are the most common type of portable LPG storage vessels. All cylinders used for LPG storage are manufactured according to DOT specifications. The most

common type of LPG storage cylinder is a barbecue cylinder. Barbecue cylinders are typically used in gas grills, but they are also used to fuel outdoor space heaters such as those used on patios at outdoor restaurants. Barbecue cylinders are rated at 20 pounds which is equivalent to 4.7 gallons water capacity. In addition, a barbecue cylinder can be refilled at a local retailer or exchanged at a location that participates in a cylinder exchange program. Exchange program cylinders are filled by weight at bulk loading facilities using an automated system and then delivered by trucks to exchange sites so that no LPG filling activities occur at the retail exchange sites. According to the WPGA, over the last few years there has been a shift from refilling barbecue cylinders at retail stations to exchanging empty cylinders at exchange sites.

Forklift Cylinders: Forklifts are standard equipment found predominantly at industrial facilities and warehouses and can be used either indoors or outdoors. The fuel tank that is connected to the forklift is referred to as a forklift cylinder. Because forklift cylinders can be disconnected from the forklift for refilling or replacement, forklift cylinders, like barbecue cylinders, are portable. Thirty-three pound LPG cylinders can hold approximately 7.9 gallons of LPG and are typically used to power most of the forklifts used at industrial sites. There are some larger forklifts in use that are equipped with 40-pound LPG cylinders that can hold approximately 9.4 gallons of LPG. LPG used to fuel forklift cylinders is typically in liquid form. Also, forklift cylinders are frequently mounted horizontally on the back of the forklift, but some forklift designs have vertical mounts. In either case, the fuel gauge on a forklift is designed to accurately indicate LPG levels when the forklift cylinder is in either a horizontal or a vertical position.

To refill forklift cylinders, a forklift cylinder delivery service, similar to a barbecue cylinder exchange, is offered by many companies. In addition, there are other LPG providers that make service calls to fill the forklift cylinders onsite. Forklift cylinders can be filled either by weight or by volume, but cylinders that are filled offsite and are transported are required to be filled by weight according to DOT regulations. In addition, forklift cylinders that are filled by volume, can be filled either by relying on a gravity-fill system, a pressure-fill system using a pump and motor, or filled directly from a bobtail truck.

Residential and Commercial Storage Tanks: In addition to portable cylinders, LPG storage containers also include stationary storage tanks that are used at residential and commercial facilities. Storage tanks can range from 150 gallons to 500 gallons for residential applications and from 250 gallons to 1,100 gallons for commercial applications. Both residential and commercial storage tanks are filled by bobtail trucks and may be filled up to levels ranging from 80 percent to 87 percent of the tank's total capacity depending on the ambient temperature. In addition, some of these tanks have more than one FLLG to accommodate the different fill levels. For example, during the summer months, operators are more likely to fill these tanks to the 80 percent level to allow for expansion at higher ambient temperatures.

LPG Fuel Dispensing

A dispensing system for LPG fuel consists of four essential functional components: 1) a storage tank; 2) a pump; 3) a metering unit; and, 4) component-connection piping (including valves and other control elements) that leads from the metering unit to the dispensing nozzle or connector.

The design of the dispensing system must also reflect its use in a specific delivery application. For example, in situations where LPG is dispensed or transferred from a bulk loading facility storage tank to a tanker truck, the transfer is typically completed at a rate of 100 gallons per

minute (gpm) or higher. However, when the same tanker truck makes its deliveries, the transfer rate of LPG will range from approximately 50 gpm to 60 gpm for retail deliveries. However, for residential deliveries via bobtail trucks, the LPG transfer rate to smaller sized storage tanks is approximately 30 gpm.

During the LPG dispensing process, the dispensing system is a closed system that is designed to prevent any liquid or vapor leaks during the transfer while being able to withstand high pressures. A dispensing system for LPG is required to comply with operating pressures pursuant to the standards developed by the American Society of Mechanical Engineers (ASME) Pressure Vessel Code, Section 8 and adopted by the Uniform Fire Code. The dispensing system must also be capable of: 1) minimizing the production of vapor within the system; and, 2) eliminating small amounts of vapor that are released to the atmosphere. Lastly, the dispensing system shall be equipped with pressure relief valves that are designed to control the amount of LPG vented to the atmosphere in the event when internal pressures exceed safety limits.

Storage Tank and Pump: A stationary storage tank is designed with a liquid fill inlet for receiving LPG and a discharge line with an outlet for dispensing LPG. A storage tank also has a vapor port that accommodates the insertion of a pressure equalization line to increase delivery efficiency under certain circumstances. The vapor port also allows for volumetric testing or system calibration. The pump provides pressure to move product from the storage tank to the receiving tank and the pump design and operating characteristics are based on its application. Also, the discharge rate and pressure of the dispensing system have to be appropriate for the system to which it delivers product.

Metering Unit: A metering unit is a device that measures the volume of liquid LPG as it passes through the meter during the dispensing process. The amount of LPG that is metered is simultaneously available to the operator and customer during the dispensing process, which allows the system operator and customer to monitor the amount of liquid that is being continuously dispensed throughout the delivery.

Vapor Eliminator and Differential Pressure Valve: As liquid is drawn from the storage tank and transferred to a receiving tank, the pressure of the liquid LPG will drop and subsequently cause some of the liquid LPG to boil. Boiling LPG will create excess vapor that increases the amount of vapor in the tank's vapor space. This occurrence is typical of any liquid LPG delivery and dispensing. To help minimize the amount of vapor that is generated during the dispensing process, the metering unit is equipped with a vapor eliminator and a differential pressure valve. The purpose of the vapor eliminator and differential pressure valve is to prevent vapor from entering the meter so that only liquid can pass through the meter for measurement. The vapor eliminator separates any vapor that is produced from the liquid flow before it reaches the meter and returns it to the vapor space in the storage tank.

The differential pressure valve maintains the pressure so that the LPG remains in a liquid state as it passes through the meter. The differential pressure valve restricts flow on the discharge side of the meter to maintain a uniform pressure in the piping and metering element upstream that is at or above the product vapor pressure.

Receiving Vessels: Receiving vessels are tanks that receive the delivered product for storage. During LPG dispensing activities, both the receiving tank and the delivery system contain a

combination of vapor and liquid LPG at all times. As the liquid is pumped into the receiving tank, the liquid level rises and in turn, causes the existing vapor in the tank to become compressed. Increased compression on the vapors in the receiving tank causes the pressure and temperature in the receiving tank to rise. Eventually equilibrium is established when the vapor in the receiving tank condenses and returns to the liquid phase.

Vapor Return Systems: Previously, older vapor return systems were designed to alleviate the pressure build-up problem in receiving tanks by connecting a vapor line between the vapor spaces of the delivery tank and the receiving tank. The vapor line connection between the two tanks would allow for equilibrium to occur in both the delivery tank and the receiving tank. However, this is not beneficial to the purchaser because product that was being purchased was forcing existing product in the tank to be returned to the seller in the form of vapor.

As a result, delivery systems now consist of a pipe from the receiving tank that is extended into the vapor space and is designed in such a way that the incoming liquid product is sprayed upward toward the top of the tank. As cooler liquid droplets descend they condense the vapor, thereby lowering the pressure in the receiving tank and allowing the system pump to deliver liquid product more efficiently.

LPG Motor Fuel Dispensing: The construction of a filling station to dispense LPG for motor fuel is similar to a gasoline filling station. Filling stations that dispense LPG offer a range of retail (e.g., immediate payment upon completion of fill) or billing services depending on customer demand. A filling station dispenser can be designed with a basic pumping and metering system or with a sophisticated state-of-the-art data collection and processing module equivalent to the technology in place at gasoline dispensing stations. A typical fill rate of a motor vehicle using LPG is about 10 gallons per minute.

LPG Fugitive Emissions

During LPG transfer activities, there are many transfer points in the distribution chain that are inefficient, so fugitive emissions of LPG are released with each transfer, which translates into product loss. Specifically, LPG fugitive emissions from transfer and dispensing operations are released from three main areas: 1) volatilization of entrapped product during disconnection of LPG supply and transfer lines; 2) leaks in the equipment used for transfer and dispensing; and, 3) venting through FLLGs used as a safety device to ensure that pressurized receiving containers, cylinders and tanks are not overfilled.

The FLLG is usually found on bobtail truck tanks, stationary tanks and portable storage tanks and is attached to a dip tube that extends into the LPG storage container. The tube is inserted to be at the maximum level to which a receiving tank is to be filled and this level is set to 80 percent of the tank's capacity with the remainder as vapor space to account for impacts of fluctuating temperature. The connection outside of the tank serves as a bleed valve. When the valve is opened during filling, LPG vapor is pushed through the FLLG and, when the desired volume is reached, liquid LPG is ejected, thereby providing the operator with a visual indication that the tank has reached its capacity and filling is complete.

According to LPG transfer operators and field observations, LPG transfer practices seem to vary relative to the period of time the FLLG is left open. The 2011 edition of NFPA 58 – Liquefied Petroleum Gas Code, §7.3.1 contains the following requirements with respect to venting: part

(1) allows FLLGs to vent to the atmosphere provided that the maximum flow would not exceed that from a No. 54 drill orifice; part (2) allows the venting of LPG between shutoff valves before disconnecting the liquid transfer line from the container; and, part (3) allows the use of bleeder valves. Thus, NFPA 58 allows the limited venting of LPG gas where necessary via FLLGs or bleeder valves.

Further, NFPA 58 requires that the FLLG be used during LPG transfer mainly to address fire and safety concerns associated with overfills and possible release of large quantities of LPG. Numerous LPG industry members have indicated that they comply with this practice when transferring LPG to a storage tank equipped with a FLLG, while other members who monitor the transfer adjust the valve at different stages during the transfer process. As such, each LPG transfer event can release varying amounts of fugitive emissions to the atmosphere depending on the operator.

AFFECTED LPG EQUIPMENT AND METHODS OF COMPLIANCE

Table 1-1 contains a summary of all the LPG equipment that will be affected by adopting PR 1177, the corresponding compliance activity per equipment, and the number of affected units.

Table 1-1
Summary of Affected LPG Equipment and PR 1177 Compliance Activity

Affected LPG Equipment	PR 1177 Compliance Activity	Number of Affected Units
Residential Storage Tanks	Install replacement low emission FLLGs	39,712 [1]
Commercial Storage Tanks	Install replacement low emission FLLGs	5,643 [1]
Barbecue Cylinder Overpressure Devices	1. Convert from fill by volume to fill by weight system (supplier); 2. Exchange customer's existing, non-compliant cylinder with new cylinder; 3. Install replacement low emission FLLGs and low emission connectors on customer's existing cylinder; or, 4. Customer to purchase new, compliant cylinder	71,000 [2]
Bobtail Trucks	Install replacement low emission FLLGs	250
Bobtail Truck Dispensers	Install replacement low emission connectors	250
Tanker Trucks	Install replacement low emission connectors	100
Forklift Tanks, not using Gravity Fill	Install replacement low emission FLLGs	60,000 [1]
Forklift Tanks supplied from on-site tank sized between 46 gallons and 125 gallons, using Gravity Fill	Remove existing tanks and convert to cylinder exchange program	2,038 [3]
Delivery Trucks for Forklift cylinder exchange program	New delivery trucks needed to specifically accommodate deliveries of forklift cylinders	6
Forklift Tanks supplied from on-site tank sized between 172 gallons and 288 gallons, using Gravity Fill	Convert to a pressure-fill system by replacing each existing tank with a larger tank (499 gallon capacity) and installing a pump/motor	196 [3]
Forklift Tanks supplied from on-site tank sized between 499 gallons and 1,150 gallons, using Gravity Fill	Convert to a pressure-fill system by installing one pump/motor per tank	415 [3]
Service Dispensers (Hose End from stationary tank to portable tank)	Install replacement low emission connectors	5,000 [4]
Bulk Loading Operations with tanks > 10,000 gallons	Conduct quarterly inspections per year	200 (facilities)[5]

[1] LPG Tank Inventory provided by WPGA, Draft Staff Report for Proposed Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing, Appendix A, March 2012.

[2] Industry estimates that 50 percent of the total barbecue tank inventory (e.g., 142,000) is included in the exchange program that employs the fill by weight process which is carried out with the FLLG or "bleeder" valve closed. The remaining 50 percent will be addressed by PR 1177.

[3] Approximately 2,141 facilities currently fill their 2,649 forklift tanks using a fill by gravity system. These facilities will, depending on tank size, either convert to a cylinder exchange program, a pressure-fill system using a pump and motor per tank, or direct fill from a bobtail truck.

[4] Based on WPGA survey data.

[5] The number of facilities is shown instead of the number of affected units because the compliance activity pertains to inspections of bulk loading operations at each facility that is equipped with one or more tanks sized at 10,000 gallons or larger. While each facility has at least one tank within this size range, multiple tanks sized at 10,000 gallons or more may exist at one facility. Nonetheless, the number of inspections directly correspond to the number of facilities, and not the number of qualifying tanks at these facilities.

There are two main control techniques for reducing fugitive VOC emissions from LPG transfer and dispensing activities: fixed liquid level gauges (FLLGs) and low emission connectors. In

addition to the retrofitting existing barbecue cylinders and dispensers with FLLGs, and dispensers with low emission connectors, respectively, LPG suppliers may choose to convert their existing fill by volume system to a fill by weight system for barbecue cylinders or LPG customers may either buy a new barbecue cylinder fitted with a No. 72 orifice drill size FLLG or participate in a barbecue cylinder exchange program. Lastly, there are multiple options available for transferring LPG into forklift cylinders that currently use a gravity fill system.

Each of these methods of compliance is described in the following sections.

Fixed Liquid Level Gauge (FLLG)

A FLLG, also referred to as a bleeder valve, is a safety device that can be used to determine the level of LPG in a tank. The FLLG is connected to a fixed dip tube that extends into the tank. The dip tube is typically set at a length equal to 80 percent liquid level tank capacity. The FLLG combined with the dip tube is designed so that during the filling process, when the LPG entering the tank reaches the 80 percent mark, liquid will flow out of the opened FLLG or bleeder valve. When this occurs, the delivery operator will know that the tank has reached its maximum filling capacity. The maximum filling level will vary based on the season because external conditions, especially ambient temperature, will affect the expansion of LPG in the tank vapor space.

Currently, a FLLG with a No. 54 orifice drill size is used on most tanks and cylinders, although some tank owners have already retrofitted tanks with a No. 72 orifice drill size. The higher the number of the orifice drill size the smaller the actual orifice size will be. A low emission FLLG fitted with a No. 72 orifice size results in a physical configuration with a cross-sectional diameter of 0.025 inch when vented during LPG transfer or dispensing activities. Thus, using a No. 72 orifice drill size, which would be required under PR 1177, will result in a reduced amount of LPG emitted from the FLLG during the filling process.

There are several manufacturers that are currently producing and distributing these low emission FLLGs with smaller orifices. SCAQMD staff's research of FLLG manufacturers has determined that, although the No. 72 orifice drill size valve may not yet be available in commercial quantities for barbecue cylinders, they are available for storage tanks, forklift cylinders and cargo tanks. One manufacturer has indicated that the low emission FLLG is available in both brass and stainless steel for bobtail applications. Manufacturers further indicated that the lead time for bringing low emission FLLGs for barbecue cylinder applications to market is expected to range from a few weeks to a few months. They also anticipate little difficulty in meeting the expected demand that would be result from the timelines established for compliance with the requirements in PR 1177.

Installation of a low emission FLLG can be handled in a variety of ways, as follows: 1) a new tank, at the time of manufacture, can be equipped with a low emission FLLG; 2) an existing tank that is taken out of service for repair or during regularly scheduled maintenance, such as recertification, can be retrofitted with a low emission FLLG as part of that service call or recertification; or, 3) an existing tank can be retrofitted at the time of the next LPG delivery prior to refilling the tank. In each of these examples, the installation of the replacement low emission FLGGs is not expected to result in noticeable differences in appearance or function relative to the existing FLLGs.

Low Emission Connectors

A low emission connector is designed to result in a maximum emission release of four cubic centimeters of LPG when disconnected. Low emission connectors are designed for use in various applications within the LPG transfer and dispensing industry. Low emission connectors are designed to minimize the volume enclosed between two connection points, which limits the release of entrapped liquid upon disconnection. Other types of low emission connectors are used for the dispensing of LPG into cylinders. Low emission connectors may be able to achieve a reduction in fugitive emissions of up to 99.6 percent when compared to standard connectors in use today.

Installation of low emission connectors such as on bobtail trucks, tanker trucks and service dispensers (hoses) that connect between a stationary tank and a portable tank, can be handled in a variety of ways. For example, for bobtail trucks and tanker trucks, the retrofit can be done on site by operators at the shut-off valve as part of regular maintenance. Similarly, to retrofit a service dispenser, the LPG provider can make the switch-out during a regular refill visit. In each of these examples, the installation of the replacement low emission connectors is not expected to result in noticeable differences in appearance or function relative to the existing low emission connectors.

Compliance Options for Barbecue Cylinders

To comply with the requirements in PR 1177 that pertain to the overfill protection devices on barbecue cylinders, there is one compliance option available for the LPG supplier and three compliance options available for the customer, as explained in the following paragraphs.

On the supplier end, relative to how barbecue cylinders are filled, an LPG supplier that currently uses a fill by volume system for its stationary storage tank can convert to a fill by weight system. In order to do so, the LPG supplier would need to have a scale that may also be equipped with an automatic shut-off valve and the scale would need to be placed adjacent to the existing stationary storage tank so that the automatic shut-off valve can be connected to the LPG dispenser. Once the system is converted to fill by weight, the automatic shut-off valve will recognize when the barbecue cylinder, as it sits on the scale, reaches the maximum allowable weight during the filling process. The benefit of using a fill by weight system is that barbecue cylinders will no longer require the bleeder valve to be open during the filling process.

For customers or owners of barbecue cylinders, there are three options available to make sure that their cylinders are PR 1177-compliant, as follows: 1) the LPG supplier can exchange each customer's existing, non-compliant empty cylinder for a full cylinder at the point of exchange; 2) the LPG supplier can install a replacement low emission FLLG on each customer's existing cylinder at the time when a refill is needed; or, 3) the customer can purchase a new, compliant cylinder from a retailer and recycle the old cylinder at the point of purchase.

Conversions from Gravity-Fill Systems for Forklift Tanks

For existing forklift tanks that are currently gravity-filled via an existing stationary storage tank, converting to the smaller low emission FLLG orifice would result in a roughly fivefold increase in filling time. Rather than continue to utilize gravity-filling in this manner, the operator may choose to pursue an alternative compliance option. The operator will have the following compliance options available to convert from gravity-fill systems: 1) remove the existing stationary storage tank and convert to a portable forklift cylinder exchange program or fill on-site

program (e.g., filling cylinders directly from a bobtail truck) by buying multiple portable cylinders and installing a cage to store these cylinders; 2) convert to a pressure-fill system by replacing the existing stationary storage tank with a new, larger stationary storage tank that is also equipped with a pump and motor; or, 3) convert to a pressure-fill system by installing a pump and motor on an existing stationary storage tank.

Implementation of each of these options is expected to vary based on the size of the existing, stationary storage tanks and what would be needed to maintain the current supply of LPG based on the baseline forklift usage relative to cost. For example, for a facility with a small existing storage tank (e.g., within the range of 46 gallons and 125 gallons), the amount of LPG needed to operate the forklifts is relatively small. As such, the facility operator would likely remove the existing stationary storage tank and instead purchase multiple, portable forklift cylinders that can be filled as part of a cylinder exchange program or fill on-site program. In this scenario, when a cylinder becomes empty, it can be exchanged with a full, stand-by replacement cylinder. Then, the empty cylinders can either be picked up by the LPG provider and replaced with full cylinders, or ~~a~~ the LPG provider can send a bobtail truck to fill the empty cylinders at the facility site.

However, in order to participate in a portable cylinder exchange program or fill on-site program, the facility operator would also be required to install a storage cage to contain the portable cylinders that are not in use. Cylinder cages enable LPG cylinders to be both stored securely and safely outdoors. LPG storage cages are typically lockable, with open air metal mesh sides, and either rigid or castor-wheeled feet, with brakes on two of the castors. LPG storage cages are required to be positioned in the open air on level concrete or compact ground. The siting of LPG storage cages are also subject to a variety of requirements as specified in NFPA 58, §§6.2.2, 6.4.5, and 8.4.1, depending, for example, upon the amount of LPG to be stored and distances to the following types of receptors:

1) Nearest important building or group of buildings.
2) Line of adjoining property that can be built upon.
3) Busy thoroughfares or sidewalks on other than private property.
4) Line of adjoining property occupied by schools, churches, hospitals, athletic fields or other points of public gathering.
5) Dispensing station.

As part of the cylinder exchange program, the LPG supplier will either be delivering filled cylinders and picking up empty cylinders or delivering LPG and filling the facility-owned cylinders directly through a bobtail truck. To accommodate the potential business for cylinder deliveries, each of the six LPG suppliers anticipate that they will need to buy one new truck to specifically handle the potential shift from bobtail LPG deliveries to a cylinder exchange program.

For a facility with a medium-sized existing storage tank (e.g., within the range of 172 gallons and 288 gallons), the amount of LPG needed to operate the forklifts is large enough to justify converting to a larger sized storage tank equipped with a pressure-fill system. In this example, a smaller storage tank can be replaced with a larger 499-gallon capacity storage tank equipped with a pump and motor.

For a facility with a large-sized existing storage tank (e.g., within the range of 499 gallons and 1,150 gallons), the amount of LPG needed to operate the forklifts is very large such that no tank replacement would be needed. Instead, the facility operator can convert the existing tank to a pressure-fill system by retrofitting the tank with a pump and motor.

Lastly, while not required, facilities converting from gravity-fill systems that choose to maintain an on-site tank could also choose to further upgrade to fill by weight by installing a scale. However, it is unlikely that a fill by weight upgrade would be widely implemented because of the low volumes used by current gravity fill operations.

PROJECT DESCRIPTION

The following summarizes the requirements in PR 1177. A copy of PR 1177 is included in Appendix A.

Purpose - Subdivision (a)

The purpose of PR 1177 is to reduce fugitive VOC emissions during the transfer and dispensing of LPG.

Applicability - Subdivision (b)

PR 1177 would apply to the transfer of LPG to and from stationary storage tanks, ~~and~~ cargo tanks (~~,~~ including bobtails, tanker trucks and rail tank cars), and cylinders, and the transfer of LPG into portable tanks.

Definitions - Subdivision (c)

For clarity, continuity, and consistency with standard terms used in the LPG industry, PR 1177 includes 26 definitions of the following terms that are used throughout the rule: bobtail truck, bubble test, cargo tank, connector, container, cylinder, fill by weight, fixed liquid level gauge (FLLG), inspection, liquid tight, low emission FLLG, LPG or liquefied petroleum gas, LPG bulk loading facility, LPG low emission connector, LPG transfer and dispensing facility, LPG vapor recovery or equalization system, LPG vapors, mobile fueler, owner/operator, portable cylinder, portable storage tank, railroad tank car, stationary cylinder, stationary storage tank, valve, and vapor tight.

Equipment and Operation Requirements - Subdivision (d)

This subdivision is divided into two categories that focus on LPG transfers: 1) at bulk loading facilities; and, 2) at transfer and dispensing facilities, as follows:

LPG Transfer at LPG Bulk Loading Facilities – paragraph (d)(1):

- PR 1177 will require operators of railroad tank cars and ~~tanker trucks~~mobile fuelers equipped with vapor recovery or equalization systems to be maintained and operated according to manufacturer's specifications. [subparagraph (d)(1)(A)]
- PR 1177 will require the vapor return lines and liquid lines, including the hose, fittings and gaskets which facilitate the movement of LPG to be properly connected between the cargo tank and the stationary storage tank and maintained to ensure that the system remains vapor tight and liquid tight during the transfer process. [subparagraphs (d)(1)(B) and (d)(1)(C)]

LPG Transfer at LPG Transfer and Dispensing Facilities – paragraph (d)(2):

- Effective July 1, 2013, PR 1177 will require all owned or leased cargo tanks, stationary storage tanks, and cylinders that are used to transfer or dispense LPG to be fitted with LPG low emission connectors. [subparagraph (d)(2)(A)]
- Effective July 1, 2013, PR 1177 will allow dispensing of LPG to a stationary storage tank provided that either the FLLG is closed during the LPG transfer, using a filling technique or technology that monitors maximum fill level without use of an FLLG. [clause (d)(2)(B)(i)]
- Effective July 1, 2013, PR 1177 will allow dispensing of LPG to a newly installed stationary storage tank provided that it is equipped with a low emission FLLG. [subclause (d)(2)(B)(ii)(I)]
- Effective July 1, 2013, PR 1177 will require existing stationary storage tanks that are currently taken out of service or will be taken out of service to be equipped with a low emission FLLG prior to returning to service. [subclause (d)(2)(B)(ii)(I)]
- Effective July 1, 2015, PR 1177 will allow dispensing of LPG to a stationary storage tank without a low emission FLLG until July 1, 2017, provided that prior to July 1, 2015, the tank has been documented to show than a low emission FLLG cannot be safely installed without relocation and that a low emission FLLG is installed prior to being returned to service. [subclause (d)(2)(B)(ii)(II)]
- Effective July 1, 2013, PR 1177 will allow dispensing of LPG to or all owned or leased bobtails provided that either the FLLG is closed during the LPG transfer, or a filling technique or technology that monitors maximum fill level is employed without the use of the FLLG. [clause (d)(2)(C)(i)]
- Effective July 1, 2013, PR 1177 will allow dispensing of LPG to a new bobtail provided that it is equipped with a low emission FLLG. [subclause (d)(2)(C)(ii)(I)]
- Effective July 1, 2013, PR 1177 will allow dispensing of LPG to a bobtail without a low emission FLLG until July 1, 2017, provided that prior to July 1, 2013 the bobtail has been documented to show than the bobtail is scheduled to undergo a pressure test or similar maintenance activity that would require evacuation of the cargo tank and that a low emission FLLG is installed prior to being returned to service. [subclause (d)(2)(C)(ii)(II)]
- Effective July 1, 2017, PR 1177 will allow dispensing of LPG to a portable tank provided that either the FLLG is closed during the LPG transfer or a filling technique or technology that monitors maximum fill level without the use of an FLLG. [clause (d)(2)(D)(i)]
- Effective July 1, 2017, PR 1177 will require portable tanks to be equipped with a low emission FLLG. [clause (d)(2)(D)(ii)]

<u>Owner/Operator Leak Detection Program Requirements -Subdivision (e)</u>

Effective January 1, 2012, this subdivision contains leak detection requirements applicable to owners and/or operators of LPG bulk loading facilities and LPG transfer and dispensing facilities that offer LPG for sale to an end user, as follows:

- PR 1177 will require daily physical inspections of all connectors involved with the transfer of LPG to check for evidence of leaks. [paragraph (e)(1)]

- PR 1177 will require a leak check inspection of LPG connectors on stationary storage tanks and cargo tanks used to supply LPG to stationary storage tanks or cargo tank by using an analyzer or bubble test every 90 days. [paragraph (e)(2)]
- PR 1177 will require an employee training program for workers who will be responsible for conducting physical leak check inspections. [paragraph (e)(3)]
- PR 1177 will require leaking equipment or connectors to be taken out of service, repaired, and re-inspected prior to being returned to operation. PR 1177 will also require records be kept to memorialize the chain of events associated with the repaired equipment or connectors. [paragraph (e)(4)]
- PR 1177 contains a clarification that any leak or defect discovered during a required physical inspection that is repaired prior to returning to service will not be considered a violation of any vapor tight standard of Rule 1177. [paragraph (e)(4)]

Recordkeeping Requirements - Subdivision (f)

PR 1177 contains requirements for the following records to be maintained by owners/operators for at least two years, as follows:

- PR 1177 will require service personnel to provide records of installation, inspections and repairs of FLLGs or connectors immediately after completion of service. In addition, PR 1177 will also require owners/operators to maintain the results of testing or other maintenance records that are relied upon to demonstrate compliance. [subparagraph (f)(1)(A)]
- PR 1177 will require owners/operators to keep maintenance records of each vapor recovery or equalization system for railroad tank cars or ~~tanker trucks~~ mobile fuelers to demonstrate that each system is maintained according to manufacturer specifications. [subparagraph (f)(1)(B)]
- PR 1177 will require owners/operators to maintain current documentation which identifies that installed low emission FLLGs and connectors meet the low emission criteria. [paragraph (f)(2)]

Reporting Requirements - Subdivision (g)

- PR 1177 will require an owner/operator of an LPG bulk loading facility whose primary business is LPG transfer and dispensing to submit to the SCAQMD a report of monthly LPG purchase and dispensing volumes for calendar years 2013, 2014 and 2015 by July 1st of 2014, 2015, and 2016, respectively. [paragraph (g)(1)]
- PR 1177 will require an owner/operator of an LPG transfer and dispensing facility that offers LPG for sale to an end user to either submit a report of monthly LPG purchase and dispensing volumes for calendar years 2013, 2014, and 2015 by July 1 of the following year or arrange to have their LPG suppliers include their purchase volumes with their report submittal. [paragraph (g)(2)]
- PR 1177 will require an owner/operator of an LPG bulk loading facility to submit an end of year inventory of the facility's low emission connectors for calendar year 2013 by July 1, 2014. [paragraph (g)(3)]
- PR 1177 will require an owner/operator of an LPG bulk loading facility to submit an end of year inventory of their facility's containers which are associated with LPG storage or transfer for calendar years 2013, 2014, 2015, 2016, and 2017 by July 1 of 2014, 2015, 2016, 2017, and 2018, respectively. The inventory shall include the number of affected

containers by category and the number of all installed low emission FLLGs. [paragraph (g)(4)]

Test Method - Subdivision (h)

PR 1177 will require that measurements of leak concentrations to be conducted in accordance with the United States Environmental Protection Agency's (USEPA) Reference Method 21 by using an analyzer that is calibrated with methane prior to the inspection. PR 1177 establishes a leak as a measurement greater than 10,000 parts per million (ppm).

Confidentiality of Information - Subdivision (i)

PR 1177 will allow information submitted to the SCAQMD to be designated as exempt from disclosure provided that the owner/operator clearly specifies which information or data would qualify for the exempt from disclosure designation in accordance with the California Public Records Act per Government Code §6250-6276.48.

Exemptions - Subdivision (j)

PR 1177 will include three exemptions, as follows:

- The transfer of LPG into any container with a water capacity less than four gallons will be exempt from the requirements of PR 1177. [paragraph (j)(1)]
- Facilities that are subject to the requirements of SCAQMD Rule 1173 will be exempt from the requirements of PR 1177. [paragraph (j)(2)]
- The requirements in PR 1177 to either equip a portable storage tank with a low emission FLLG or to use a fill by weight or alternative fill technique will not apply to LPG cylinders that are specifically dedicated and installed for use with recreational vehicles. [paragraph (j)(3)]

CHAPTER 2 - ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Environmental Checklist and Discussion

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's potential adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Final ~~Draft~~ Environmental Assessment (EA) for Proposed Rule (PR) 1177 – Liquefied Petroleum Gas Transfer and Dispensing
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive Diamond Bar, CA 91765
CEQA Contact Person:	Ms. Barbara Radlein (909) 396-2716
PR 1177 Contact Person	Mr. Kennard Ellis (909) 396-2457
Project Sponsor's Name:	South Coast Air Quality Management District
Project Sponsor's Address:	21865 Copley Drive Diamond Bar, CA 91765
General Plan Designation:	Not applicable
Zoning:	Not applicable
Description of Project:	SCAQMD staff is proposing to adopt PR 1177 to reduce emissions of VOCs from the transfer and dispensing of LPG during deliveries to residential, industrial and commercial users, transfers to fueling stations and cylinder refueling. PR 1177 would apply to the transfer of LPG to and from stationary storage tanks, ~~and~~ cargo tanks (~~,~~ including bobtails, tanker trucks and rail tank cars), and cylinders, and the transfer of LPG into portable refillable tanks.
Surrounding Land Uses and Setting:	Not applicable
Other Public Agencies Whose Approval is Required:	Not applicable

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐	Aesthetics	☐	Geology and Soils	☐	Population and Housing
☐	Agriculture and Forestry Resources	☑	Hazards and Hazardous Materials	☐	Public Services
☑	Air Quality and Greenhouse Gas Emissions	☐	Hydrology and Water Quality	☐	Recreation
☐	Biological Resources	☐	Land Use and Planning	☑	Solid/Hazardous Waste
☐	Cultural Resources	☐	Mineral Resources	☑	Transportation/Traffic
☑	Energy	☑	Noise	☑	Mandatory Findings

DETERMINATION

On the basis of this initial evaluation:

☑ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline §15252, COULD NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts has been prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will NOT be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. An ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL ASSESSMENT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL ASSESSMENT pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL ASSESSMENT, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: March 30, 2012 Signature: Steve Smith

Steve Smith, Ph.D.
Program Supervisor

ENVIRONMENTAL CHECKLIST AND DISCUSSION

PR 1177 would apply to the transfer of LPG to and from stationary storage tanks, ~~and~~ cargo tanks (~~,~~ including bobtails, tanker trucks and rail tank cars), and cylinders, and the transfer of LPG into portable refillable tanks. The emissions inventory for sources that will be regulated by PR 1177 is comprised of fugitive VOC emissions released from LPG transfer and dispensing operations within the district. The sources of fugitive emissions are categorized by the following activities:

- Disconnection of liquid line
- Disconnection of vapor line
- Disconnection of the "jump line" that is used to connect truck and trailer cargo tanks.
- Vapor released from the FLLG
- Liquid released from the FLLG

By requiring the use of low emission connectors for transfer and dispensing of LPG to limit the discharge of LPG upon disconnection, the installation of low emission FLLGs on applicable receiving tanks (e.g., stationary tanks, portable tanks, and cargo tanks), the conversion of gravity-fill systems for filling forklift cylinders, and, the conversion of fill by volume systems for filling barbecue cylinders, PR 1177 is estimated to reduce VOC emissions from these sources by 6.1 tons per day. In order to achieve these emission reductions, physical modifications (e.g., the installation of low emission FLLGs and low emission connectors, the conversion of gravity-fill systems for filling forklift cylinders, and the conversion from fill by volume systems for filling barbecue cylinders) would need to be made on various LPG storage and transfer equipment. The effects of implementing these physical modifications have been analyzed in this chapter.

All other provisions in PR 1177 would not require any new physical modifications in order to achieve compliance, such as: 1) conducting routine leak detection inspections and repair by trained personnel; 2) keeping records and submitting reports to demonstrate compliance with PR 1177, and, 3) conduct proper maintenance of vapor recovery or equalization systems at bulk loading facilities. Thus, because these compliance activities would not involve any physical modifications, they are not expected to create any adverse environmental effects.

Therefore, the answers to the following checklist items are based on only the physical modifications that would be used to meet the requirements of PR 1177.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☑
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☑

Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

Discussion

I.a), b), c) & d) In order to comply with PR 1177, physical modifications (e.g. the installation of low emission FLLGs and low emission connectors and the resultant conversion of gravity-fill systems for filling forklift cylinders) would need to be made on various LPG storage and transfer equipment. Specifically, PR 1177 would require low emission FLLGs to be installed on residential tanks, commercial tanks, portable cylinders, bobtail trucks, and forklift tanks. These installations could be handled in a variety of ways: 1) a new tank, at the time of manufacture, could be equipped with a low emission FLLG; 2) an existing tank that is taken out of service for repair or part of regularly schedule maintenance such as recertification could be retrofitted with a low emission FLLG as part of that service call or recertification; or, 3) an existing tank could be retrofitted at the time of the next LPG delivery prior to refilling the tank.

PR 1177 would also require the installation of low emission connectors on bobtail trucks, tanker trucks and service dispensers (hoses) that connect between a stationary tank and a portable tank. These installations could be handled in a variety of ways. For example, for bobtail trucks and tanker trucks, the retrofit could be done on site by operators at the shut-off valve as part of regular maintenance. Similarly, to retrofit a service dispenser, the LPG provider could make the switch-out during a regular refill visit.

Installing or replacing existing FLLGs and connectors with PR 1177-compliant devices is not expected to noticeably alter the appearance or function relative to the existing FLLGs and connectors as there is little difference in the size and shape between compliant and noncompliant connectors and FLLGs.

To comply with the requirements in PR 1177 that pertain to the overfill protection devices on portable or barbecue cylinders, only the compliance option for the LPG supplier to convert a barbecue cylinder filling system from a fill by volume system to a fill by weight system is expected to create a visible, physical change. Specifically, under this option, the LPG supplier

would need to have a scale that may be equipped with an automatic shut-off valve and the scale would need to be placed adjacent to the existing stationary storage tank so that the automatic shut-off valve can be connected to the LPG dispenser. Because the size profile of the existing storage tank is so much larger than the scale and automatic shut-off that would be installed, and that the scale is a portable piece of equipment, the change in physical appearance is not expected to be substantially noticeable.

The other three compliance options for barbecue cylinders (exchanging barbecue cylinders, retrofitting barbecue cylinders, or buying new barbecue cylinders) focus on physical changes to the inner workings of the barbecue cylinder which would not noticeably change the outside appearance of the barbecue cylinder.

The resultant conversion of gravity-fill systems for filling forklift cylinders by converting to a cylinder exchange program, fill on-site program, or pressure-fill system may cause some physical changes at affected facilities. These facilities would be expected to, depending on tank size, either convert to a cylinder exchange program or a pressure-fill system using a pump and motor per tank.

The conversion to a cylinder exchange program or fill on-site program would mean the removal of existing stationary storage tanks in the estimated size range from 46 gallons to 125 gallons and the installation of a storage cage to hold four to 16 portable cylinders. The dimensions of a four cylinder capacity storage cage are approximately 3.25 feet high, 2.75 feet wide, and 3.0 feet deep and would occupy a footprint of 8.25 square feet. Similarly, the dimensions of a 16 cylinder capacity storage cage are approximately 5.8 feet high, 5.0 feet wide, and 3.0 feet deep and would occupy a footprint of 15 square feet. Since the footprint of the storage cage is similar to or less than that of the storage tank being removed (e.g., one 125-gallon LPG storage tank has a footprint of approximately 16 square feet), the overall visual profile for a conversion from a gravity-fill system to a cylinder exchange program is not expected to dramatically change.

The conversion to a pressure-fill system could involve the replacement of a smaller tank (e.g., within the estimated size range of 172 gallons to 288 gallons) with a larger tank (e.g., 499 gallon capacity) plus a small pump and motor rated up to 1.25 horsepower (HP) with flowrate of up to 15 gallons per minute (gpm). The replacement of a smaller tank with a larger tank could require the removal of an existing concrete pad and replacing it with a larger concrete pad. For example, the dimensions of a 250 gallon tank are approximately 7.2 feet wide by 3.3 feet high which is equivalent to a footprint of approximately 24 square feet. As a point of comparison, the dimensions of a 499 gallon tank are approximately 10 feet wide by 3.1 feet high which is equivalent to a footprint of approximately 31 square feet. Further, an additional two square feet may be needed to accommodate space for the pump and motor system. While the size of the footprint is expected to increase by approximately nine square feet, the projected increase in footprint is relatively small when compared to the size of warehouse space where forklifts are typically used.

Lastly, for some facilities, the conversion to a pressure-fill system could involve the upgrade of an existing tank (e.g., within the estimated size range of 499 gallons to 1,150 gallons) with a new pump and motor rated up to 3.0 HP with flowrate of up to 35 gpm. As mentioned previously, the dimensions of a 499 gallon tank are approximately 10 feet wide by 3.1 feet high which is equivalent to a footprint of approximately 31 square feet and the dimensions of a 1,150 gallon

tank are approximately 8.75 feet wide by 5.0 feet high which is equivalent to a footprint of approximately 43.75 square feet. In this example, since the tanks are existing and operational, no changes to the size profile of the storage tank or the existing concrete pad would be necessary and only a new concrete pad of up to two square feet would potentially be needed to accommodate the new pump and motor adjacent to the tank, if the existing concrete pad does not have sufficient space available.

Manufacturing or retrofitting tanks equipped with low emission FLLG valves and low emission connectors on LPG dispensing equipment would not appreciably change the visual profile of the building(s) where LPG storage and dispensing equipment are manufactured or serviced, because any changes to the manufacturing or service processes would occur inside the facility's buildings and, therefore, would not affect the exterior of the structure in any way.

For the aforementioned reasons, in each of these situations, the overall visual profile is not expected to cause a noticeable visual change from the existing setting. Thus, implementation of PR 1177 would not result in any new construction of buildings or other structures that would obstruct scenic resources or degrade the existing visual character of a site, including but not limited to, trees, rock outcroppings, or historic buildings.

With regard to potential light and glare impacts, PR 1177 would require minor modifications to existing equipment or replacing existing equipment (e.g., LPG storage tanks) with other storage tanks of similar size or larger. Neither modifications nor replacements would be expected to affect hours of operation, so additional operating hours at night that could require additional nighttime lighting would not be required or necessary. Further, additional light or glare impacts in the areas near affected facilities, because equipment used to comply with PR 1177 are not considered to be light generating equipment

Based upon these considerations, significant adverse aesthetics impacts are not anticipated and will not be further analyzed in this Final ~~Draft~~ EA. Since no significant adverse aesthetics impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?	☐	☐	☐	☑

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104 (g))?	☐	☐	☐	☑
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑

Significance Criteria

Project-related impacts on agriculture and forest resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Discussion

II.a), b), c) & d) Implementation of PR 1177 would not result in any new construction of buildings or other structures that would convert farmland to non-agricultural use or conflict with zoning for agricultural use, a Williamson Act contract, forest land, or timberland. Similarly, the proposed project would not require affected facility operators to acquire additional land to modify or replace existing equipment. Any physical changes at a facility in response to converting from gravity-fill systems for forklifts would be limited to existing facilities in typically commercial and industrial areas. In addition, any physical changes in response to converting from fill by volume to fill by weight for barbecue cylinders would be limited to existing facilities like gas stations or other retail LPG suppliers. Further, the manufacturing or retrofit of tanks equipped with low emission FLLG valves and low emission connectors would

not require converting farmland to non-agricultural uses because these activities are expected to occur completely within the confines of existing affected industrial, commercial, residential, retail, or agricultural settings where the LPG storage and dispensing activities currently occur.

The use of low emission FLLGs and low emission connectors that would be required to comply with the requirements in PR 1177 is expected to be similar in function to the existing devices being replaced, including LPG storage and dispensing activities occurring in agricultural settings. Even though there may be LPG transfer and dispensing activities in agricultural settings, installing low emission FLLGs and low emission connectors on the affected units to comply with PR 1177 will be a one-time event and will not affect farming or agricultural practices. For these same reasons, PR 1177 would not result in the loss of forest land or conversion of forest land to non-forest use.

Based upon these considerations, significant adverse agriculture and forest resources impacts are not anticipated and will not be further analyzed in this ~~Draft~~ Final EA. Since no significant agriculture and forest resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
III. AIR QUALITY AND GREENHOUSE GAS EMISSIONS. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑	☐
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☐	☑	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐
f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑	☐

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
g) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
h) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

Air Quality Significance Criteria

To determine whether or not air quality impacts from adopting and implementing PR 1177 are significant, impacts will be evaluated and compared to the criteria in Table 2-1. The project will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 2-1 are equaled or exceeded.

Table 2-1
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction [b]**	**Operation [c]**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO2eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants [d]		
NO2 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour average annual average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation) 1.0 μg/m^3	
PM2.5 24-hour average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation)	
SO2 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 μg/m^3 (state)	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day Average Rolling 3-month average Quarterly average	1.5 μg/m^3 (state) 0.15 μg/m^3 (federal) 1.5 μg/m^3 (federal)	

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[d] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million μg/m^3 = microgram per cubic meter ≥ = greater than or equal to
MT/yr CO2eq = metric tons per year of CO2 equivalents > = greater than

III.a) The 2007 Air Quality Management Plan, specifically Control Measure CM#2007 MCS-07 – Application of All Feasible Measures, contains general VOC emission reduction goals. PR 1177 would partially implement CM#2007 MCS-07 to achieve VOC emission reductions from LPG transfer and dispensing activities. Therefore, PR 1177 is not expected to conflict with or obstruct implementation of the applicable air quality control plan because the 2007 AQMP demonstrates that the effects of all existing rules, in combination with implementing all AQMP control measures (including "black box" measures not specifically described in the 2007 AQMP) would bring the district into attainment with all applicable national and state ambient air quality standards. Therefore, PR 1177 is not expected to significantly conflict or obstruct implementation of the applicable air quality plan, but instead, would contribute to attaining and maintaining the ozone and PM standards by achieving VOC reductions.

III.b) & f) For a discussion of these items, refer to the following analysis:

Construction Impacts

Construction impacts were analyzed for all the LPG equipment that would be affected by adopting PR 1177 in accordance with the compliance dates summarized in Table 2-2.

Table 2-2
Summary of Affected LPG Equipment and PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date
Residential Storage Tanks	39,712	Install replacement low emission FLLGs	a. July 1, 2013 for new tanks or existing tanks taken out of service b. July 1, 2017 if documentation provided regarding unsafe retrofit c. July 1, 2015 for all others
Commercial Storage Tanks	5,643	Install replacement low emission FLLGs	a. July 1, 2013 for new tanks or existing tanks taken out of service b. July 1, 2017 if documentation provided regarding unsafe retrofit c. July 1, 2015 for all others

Table 2-2 (continued)
Summary of Affected LPG Equipment and PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date
Barbecue Cylinder Overpressure Devices	71,000	1. Convert from fill by volume to fill by weight system (3,300 suppliers); 2. Exchange customer's existing empty cylinder with a full cylinder; 3. Install replacement low emission FLLG on each customer's existing cylinder; or, 4. Customer to purchase new cylinder equipped with low emission FLLGs and low emission connectors	a. July 1, 2013 for low emission connector retrofit on dispenser b. July 1, 2017 for FLLG retrofit or no FLLG if fill by weight with existing FLLG closed
Bobtail Trucks	250	Install replacement low emission FLLGs	a. July 1, 2013 for new or leased bobtails b. July 1, 2017 if documentation is provided by July 1, 2013 for pressure test, maintenance, etc.
Bobtail Truck Dispensers	250	Install replacement low emission connectors	July 1, 2013
Tanker Trucks	100	Install replacement low emission connectors	July 1, 2013
Forklift Tanks, not using Gravity Fill	60,000	Install replacement low emission FLLGs	July 1, 2017
Forklift Tanks sized between 46 gallons and 125 gallons, using Gravity Fill	2,038	Remove existing tanks and convert to cylinder exchange program	July 1, 2017
Delivery Trucks for forklift cylinder exchange program	6	Purchase new delivery trucks needed to specifically accommodate deliveries of forklift cylinders*	July 1, 2017*
Forklift Tanks sized between 172 gallons and 288 gallons, using Gravity Fill	196	Convert to a pressure-fill systems by replacing each existing tank with one larger tank (499 gallon capacity) and installing a pump/motor	July 1, 2017

* While there is no compliance requirement in PR 1177 for LPG providers to buy a new delivery truck for the forklift cylinder exchange program, but the timing by which these new truck purchases are expected to occur will correspond to the July 1, 2017 compliance date for the conversion of forklift tanks sized between 46 gallons and 125 gallons, using gravity fill, to a cylinder exchange program.

Table 2-2 (concluded)
Summary of Affected LPG Equipment and PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date
Forklift Tanks sized between 499 gallons and 1,150 gallons, using Gravity Fill	415	Convert to a pressure-fill system by installing one pump/motor per existing tank	July 1, 2017
Service Dispensers (Hose End from stationary tank to portable tank)	5,000	Install replacement low emission connectors	July 1, 2013
Bulk Loading Operations with tanks > 10,000 gal	200 (facilities)	Conduct quarterly inspections per year	January 1, 2013

Installing Low Emission FLLGs and Low Emission Connectors

In order to comply with PR 1177, physical modifications (e.g. the installation of low emission FLLGs and low emission connectors, the conversion of fill by volume for filling barbecue cylinders, and the conversion of gravity-fill systems for filling forklift cylinders) would need to be made on various LPG storage and transfer equipment. Specifically, PR 1177 would require low emission FLLGs to be installed on residential tanks, commercial tanks, barbecue cylinders, bobtail trucks, and forklift tanks, unless these tanks are filled by a technique or technology that does not require the FLLG to be opened. These installations can be handled in a variety of ways: 1) a new tank, at the time of manufacture, can be equipped with a low emission FLLG; 2) an existing tank that is taken out of service for repair or part of regularly schedule maintenance, such as recertification, can be retrofitted with a low emission FLLG as part of that service call or recertification; or, 3) an existing tank can be retrofitted with a low emission FLLG at the time of the next LPG delivery prior to refilling the tank. Physical modifications on affected equipment that would require the replacement of FLLGs as shown in Table 2-2 are expected to occur through the use of hand tools, instead of high emitting off-road construction equipment or other equipment requiring a generator, and drop-in replacement units or parts.

PR 1177 will also require the installation of low emission connectors on bobtail trucks, tanker trucks and service dispensers (hoses) that connect between a stationary tank and a portable tank. These installations can be handled in a variety of ways. For example, for bobtail trucks and tanker trucks, the retrofit can be done on site by operators at the shut-off valve as part of regular maintenance. Similarly, to retrofit a service dispenser, the LPG provider can make the switch-out during a regular refill visit. Physical modifications on affected equipment that would require the replacement of low emission connectors as shown in Table 2-2 are expected to occur through the use of hand tools, instead of high emitting off-road construction equipment or other equipment requiring a generator, and drop-in replacement units or parts.

The first step of the replacement process is that each LPG provider would need to order PR 1177-compliant replacement parts and the amount of parts ordered would directly correspond to the number of customers and the number of affected equipment per customer. Because LPG providers typically keep replacement parts on-hand to have during regular service calls and leak repairs, any additional replacement parts that would be required by PR 1177 would be offset by an equal reduction in orders for the older, non-compliant replacement parts. Thus, this analysis assumes that there would not be an increase in the need for additional delivery trips for the delivery of PR1177-compliant parts.

The second step of the replacement process would be for each LPG provider to work with each customer, according to the compliance schedule in PR 1177, to decide which affected equipment would be retrofitted with new low emission FLLGs and/or low emission connectors. Once this determination is made, the LPG provider would schedule the replacement as part of a regular delivery or regular maintenance service call, as appropriate. Because the majority of replacements could be accomplished by a service technician during regular LPG deliveries or maintenance service calls, whether on-site or off-site as determined based on the location of the affected equipment, with the use of hand tools, this analysis assumes that PR 1177 would not require heavy-duty construction equipment. Further, for these same reasons, PR 1177 would not cause an increase in deliveries or service calls for the sole purpose of replacing old FLLGs and low emission connectors with PR 1177-compliant devices. Thus, for any affected LPG equipment identified in Table 2-2 with a compliance activity shown to require the installation of replacement low emission FLLGs or replacement low emission connectors, the analysis assumes that there would be no new truck trips for the delivery of the replacement parts and there would be no new truck trips for the LPG providers to actually install the replacement parts on the affected units. Since there would be no new truck trips that would associated with these installations and no use of construction equipment, no increase in combustion emissions above the existing setting are expected to occur as a result of implementing this portion of PR 1177.

Barbecue Cylinders

To comply with the requirements in PR 1177 that pertain to the overfill protection devices on barbecue cylinders, only the compliance option for the LPG supplier to convert a barbecue cylinder filling system from a fill by volume system to a fill by weight system is expected to create a physical change at an affected facility. Specifically, under this option, the LPG supplier would need to install a scale that may be equipped with an automatic shut-off valve and the scale would need to be placed adjacent to the existing stationary storage tank so that the automatic shut-off valve can be connected to the LPG dispenser. Scales that are used for weighing barbecue cylinders during the filling process are typically portable units that consist of a single platform. Dimensions of a typical scale are approximately 1.5 feet long by 2.25 feet deep which is equivalent to a footprint of 3.4 square feet. An LPG scale is a pre-fabricated self-supporting unit that is delivered in a container complete and ready to operate. Because the scale is a portable unit, there is no requirement to anchor the scale to a concrete slab. Once the scale is delivered, it may take one to two existing employees to offload and place the scale in the needed location and one employee using hand tools to connect the optional automatic shut-off valve, as applicable.

There are approximately 3,300 facilities that currently provide LPG service for filling barbecue cylinders. Currently, an estimated 71,000 barbecue cylinders are filled by volume at service stations. Of these facilities, approximately 20 percent or 660 are estimated to continue to use a

fill by volume system when filling barbecue cylinders. The remaining 80 percent are projected to use an existing fill by weight system for barbecue cylinder refilling. To convert to a fill by weight system, one scale plus one automatic shut-off valve is assumed to be installed for each facility that currently utilizes a fill by volume system. Thus, 660 scales and 660 optional automatic shut-off valves may be installed at 660 facilities. For compatibility reasons, the manufacturer of the scale is expected to be the same as the manufacturer of the automatic shut-off valve. Therefore, it is expected that both units would be shipped together in one delivery trip per facility. WPGA has projected that these affected facilities will take about one year from the adoption of PR 1177 to begin assessing future compliance activities that will pertain to conversions to fill by weight systems[7]. Since the compliance date is July 1, 2017, WPGA assumes that conversions would be expected to occur over a more conservative time-frame – a four-year period (e.g., between July 1, 2013 and July 1, 2017), instead of the five-year period (e.g., June 1, 2012 to July 1, 2017) that would be provided under PR 1177. Thus, the delivery and installation of 660 scales and 660 optional automatic shut-off valves over a four-year period, at 260 working days per year, results in an average of one round trip delivery per day. To provide a more conservative analysis of delivery trips, the average number of truck trips is doubled to provide a peak daily trip rate of up to two round trip deliveries per day. Table 2-3 contains a summary of the peak daily "worst-case" construction emissions from delivery trips associated with the conversion to fill by weight systems for barbecue cylinders.

Table 2-3
Peak Daily "Worst-Case" Construction Emissions from the Conversion to Fill by Weight Systems for Barbecue Cylinders

Peak Construction Activity	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Delivery of Scales/Valves (2 round trips/day)	0	3	3	0.01	0	0
Peak TOTAL	**0**	**3**	**3**	**0.01**	**0**	**0**
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Lastly, the other three compliance options for barbecue cylinders (exchanging barbecue cylinders, retrofitting barbecue cylinders, or buying new barbecue cylinders) focus on fitting each cylinder with a low emission FLLG. The physical modifications that may be made on barbecue cylinders that would require the replacement of FLLGs are described in the previous section pertaining to installing compliant low emission FLLGs on various equipment. Thus, no new truck trips that would be associated with the installations of compliant low emission FLLGs on barbecue cylinders, no use of construction equipment, and no increase in combustion emissions above the existing setting are expected to occur as a result of implementing this portion of PR 1177.

Forklift Cylinders

The conversion of gravity-fill systems for filling forklift cylinders by converting to a cylinder exchange program, fill on-site program, or pressure-fill system may cause some physical changes at affected facilities. These facilities would be expected to, depending on tank size, either

[7] Personal communication between Kennard Ellis, SCAQMD and Lesley Brown Garland, Western Propane Gas Association (WPGA), March 8, 2012.

convert to a cylinder exchange program, fill on-site program, or a pressure-fill system using a pump and motor per tank.

Conversion to Cylinder Exchange or Fill On-site Program

The conversion to a cylinder exchange program or fill on-site program would mean the removal of existing stationary storage tanks in the estimated size range from 46 gallons to 125 gallons with a footprint of approximately 16 square feet. Currently, degassing and then removing a storage tank must be done by LPG professionals who are required to be licensed, which demonstrates that they are knowledgeable regarding the procedures for dismantling and removing LPG tanks, including all of the valves and fittings. The current procedures for removing an LPG tank typically include the following: 1) the tank is inspected and assessed for its overall condition and value by a licensed LPG professional; 2) the tank is degassed and cleaned; 3) the tank is disconnected from the concrete slab; and, 4) the tank is hauled away. Because it is common for used LPG tanks to have economic value, used LPG tanks are frequently restored or repaired and recertified for reuse elsewhere. For damaged or deteriorated LPG tanks unfit for resale, the tanks can either be disposed of or the metal can be sold for scrap. It is important to note, however, that even if a tank is removed, there is no requirement in PR 1177 to install a new stationary storage tank or remove or otherwise disturb the existing concrete pad upon which the LPG tank previously rested.

In this example, there are 2,308 existing tanks, ranging in capacity between 46 gallons and 125 gallons, that may be removed from affected facilities. Of these tanks, the size distribution is as follows: 250 tanks in the 46 gallon size; 330 tanks in the 50 gallon size; 1,308 tanks in the 96 gallon size, and 150 tanks in the 125 gallon size. As is the case with barbecue cylinders, the final compliance date is July 1, 2017. However, WPGA assumes that it will take industry about one year to decide how to address complying with PR 1177. Thus, WPGA estimated that conversions would be expected to occur over a more conservative, shortened time-frame – a four-year period (e.g., between July 1, 2013 and July 1, 2017), instead of a five-year period (e.g., June 1, 2012 to July 1, 2017)[8]. Further, the removal of each tank is assumed to correspond to one round trip. The LPG industry utilizes medium-duty crane trucks (15,000 gross vehicle weight) for tank removals.

Based on the aforementioned assumptions, the removal of 2,038 existing tanks, over a four-year period, at 260 working days per year may result in an average of two tank removals per day. To provide a more conservative analysis of tank removals, the average number of tank removals per day is doubled to provide a peak daily "worst-case" rate of four tank removals per day.

The next step in the process of converting to a cylinder exchange program for forklift tanks is to quantify the number of LPG cylinders that need to be purchased and delivered. This number is based on the capacity of the cylinder (e.g., one filled LPG forklift cylinder contains 33 pounds, which is equivalent to approximately 7.9 gallons of LPG) at a ratio proportionate to the storage capacity offset for each removed stationary storage tank. For example, six new cylinders would be needed for every 46 gallon or 50 gallon tank removed, 12 new cylinders would be needed for every 96 gallon tank removed, and 16 new cylinders would be needed for every 125 gallon tank removed.

[8] Personal communication between Kennard Ellis, SCAQMD and Lesley Brown Garland, Western Propane Gas Association (WPGA), March 8, 2012.

Lastly, because these surplus cylinders would need a suitable storage location, each owner/operator of an affected facility would also be required to purchase and install a storage cage capable of holding as little as four cylinders (to replace the 46 gallon and 50 gallon sized tanks that were removed) up to as many 16 portable cylinders (to replace the 125 gallon sized tanks that were removed). Thus, each owner/operator of the 1,530 affected facilities would also be expected to purchase 1,530 storage cages of varying sizes by July 1, 2017. LPG storage cages are typically lockable, with open air metal mesh sides, and either rigid or castor-wheeled feet, with brakes on two of the castors. LPG storage cages are required to be positioned in the open air on level concrete or compact ground. The siting of LPG storage cages are also subject to a variety of requirements as specified in NFPA 58, §§6.2.2, 6.4.5, and 8.4.1 depending on the amount stored and distances to a variety of different types of receptors (for more information on distance requirements, see the discussion under the section entitled *Conversions from Gravity-Fill Systems for Forklift Tanks*. Thus, installation of a storage cage does not require any construction activities such as pouring a new concrete slab or bolting the cage to an existing concrete slab.

In summary, as part of the process of converting to a cylinder exchange program, the owners/operators of the 1,530 affected facilities would be expected to purchase 21,576 portable LPG cylinders and 1,530 storage cages by July 1, 2017 as summarized in Table 2-4.

Table 2-4
Cylinders & Storage Cages Needed For Equivalency with Existing Storage Capacity for Forklift Tanks

	Existing Tanks				
	46 gallon	**50 gallon**	**96 gallon**	**125 gallon**	**TOTAL**
No. of Facilities	250	330	800	150	**1,530**
No. of Existing Tanks to be Removed	250	330	1,308	150	**2,038**
No. of Replacement Cylinders Needed	1,500	1,980	15,696	2,400	**21,576**
No. of Cylinder Storage Cages Needed	250	330	800	150	**1,530**

Notes:
1. One forklift cylinder can hold approximately 7.9 gallons of LPG.
2. The storage capacity of one 46-gallon tank or one 50-gallon tank is equivalent to approximately six forklift cylinders.
3. The storage capacity of one 96-gallon tank is equivalent to approximately 12 forklift cylinders.
4. The storage capacity of one 125-gallon tank is equivalent to 16 forklift cylinders.
5. One storage cage is needed per facility and the size of the storage cages can vary between holding four cylinders and 16 cylinders.

WPGA assumes that it will take industry about one year to decide how to address complying with this aspect of PR 1177. Thus, WPGA assumes that conversions would be expected to occur over a more conservative, shortened time-frame – a four-year period (e.g., between July 1, 2013 and July 1, 2017), instead of a five-year period (e.g., June 1, 2012 to July 1, 2017)[9]. The purchase of the replacement cylinders and storage cages is assumed to correspond to one combined round trip delivery per facility. Thus, the purchase and delivery of replacement cylinders and storage cages to 1,530 facilities, over a four-year period at 260 working days per year, is estimated to result in an average of two deliveries per day. To provide a more

[9] Personal communication between Kennard Ellis, SCAQMD and Lesley Brown Garland, Western Propane Gas Association (WPGA), March 8, 2012.

conservative analysis of delivery trips, the average number of delivery trips is doubled to provide a peak daily trip rate of up to four round trip deliveries per day.

Table 2-5 contains a summary of the peak daily "worst-case" construction emissions from the truck trips associated with removing existing LPG storage tanks, and delivering replacement cylinders and storage cages as part of converting to a cylinder exchange program for forklift tanks.

Table 2-5
Peak Daily "Worst-Case" Construction Emissions from the Conversion to a Cylinder Exchange Program for Forklift Tanks

Peak Construction Activity	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Tank Removal Truck Trips (4 roundtrips per day)	1	6	6	0.01	0	0
Delivery of replacement cylinders and storage cages (4 roundtrips per day)	1	6	6	0.01	0	0
Peak TOTAL	**2**	**11**	**13**	**0**	**0**	**0**
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Lastly, as part of the conversion to a cylinder exchange program, the empty portable forklift cylinders can either be picked up and full cylinders can be dropped off via a cylinder delivery truck or the facility can continue to receive LPG via a bobtail truck to fill their empty cylinders on-site. For any facility that previously received LPG via a bobtail truck to fill a stationary storage tank that will continue to receive LPG via a bobtail truck to directly fill their forklift cylinders instead, the peak daily bobtail truck trips are not expected to increase above the existing setting. However, for LPG suppliers to deliver full replacement cylinders and to pick up empty cylinders, WPGA indicated that all six of the LPG suppliers would need to purchase one new delivery truck each that is designed specifically to accommodate deliveries of forklift cylinders since their current bobtail trucks are not equipped to handle cylinder deliveries. However, because the deliveries that these trucks would be making would be offset by an equal reduction in trips previously made by bobtail trucks to deliver bulk LPG to the previous stationary storage tanks, no net increase in truck trips is anticipated to result in response to the purchase of the new trucks.

Conversion to Pressure-Fill Systems

The conversion to a pressure-fill system could involve the replacement of a smaller tank (e.g., within the estimated size range of 172 gallons to 288 gallons) with a larger tank (e.g., 499 gallon capacity) plus a small pump and motor rated up to 1.25 HP with flowrate of up to 15 gpm. Currently, degassing and removing a storage tank must be done by LPG professionals who are required to be licensed, which demonstrates that they are knowledgeable regarding the procedures for dismantling and removing LPG tanks, including all of the valves and fittings. The current procedures for removing an LPG tank typically include the following: 1) the tank is inspected and assessed for its overall condition and value by a licensed LPG professional; 2) the tank is degassed and cleaned; 3) the tank is disconnected from the concrete slab; and, 4) the tank is hauled away. Because it is common for used LPG tanks to have economic value, used LPG tanks are frequently restored or repaired and recertified for reuse elsewhere. For damaged or

deteriorated LPG tanks unfit for resale, the tanks can either be disposed of or the metal can be sold for scrap.

The replacement of a smaller tank with a larger tank could require the removal of an existing concrete pad and pouring of a larger concrete pad. Since horizontal tanks generally occupy a larger footprint than vertical tanks of the same capacity, this analysis assumes that each removed tank will be replaced with a new horizontal tank. For example, the dimensions of an existing, horizontal 250 gallon tank is approximately 7.2 feet long by 3.3 feet high which occupies a footprint of approximately 24 square feet. As a point of comparison, the dimensions of a new, horizontal 499-gallon tank is approximately 10 feet long by 3.1 feet high which would occupy a footprint of approximately 31 square feet. Further, an additional two square feet may be needed to accommodate the pump and motor system. Thus, the installation of a new 499-gallon tank equipped with a pump and motor system would require a slightly larger concrete slab to accommodate approximately 33 square feet, an increase of approximately nine square feet larger than the existing setting.

Lastly, for some facilities, the conversion to a pressure-fill system could involve the upgrade of an existing tank (e.g., within the estimated size range of 499 gallons to 1,150 gallons) with a new pump and motor rated up to 3.0 HP with flowrate of up to 35 gpm. While no demolition activities would be required, an additional two square feet may be needed to accommodate space for the new pump and motor system. If the concrete slab for the existing LPG storage tank is not large enough to accommodate the new pump and motor system, an additional concrete slab may need to be poured adjacent to the existing tank for this purpose.

Table 2-6 summarizes the quantities and capacities of existing LPG storage tanks that may be converted to pressure-fill systems.

Table 2-6
Conversion of Existing Storage Capacity to Pressure-Fill Systems for Forklift Tanks

	Existing Tanks						
	172 gallon	**250 gallon**	**288 gallon**	**499 gallon**	**1,000 gallon**	**1,150 gallon**	**TOTAL**
No. of Facilities	11	100	85	350	5	60	**611**
No. of Existing Tanks to be Removed	11	100	85	0	0	0	**196**
No. of Concrete Pads to be Demolished and Re-Poured	11	100	85	0	0	0	**196**
No. of New Replacement Tanks Needed (with 499 gallon capacity)	11	100	85	0	0	0	**196**
No. of Pumps/Motors Needed	11	100	85	350	5	60	**611**
Size of Pumps & Motors Needed	1.25 HP; 15 gpm	1.25 HP; 15 gpm	1.25 HP; 15 gpm	1.25 HP; 15 gpm	3 HP 35 gpm	3 HP 35 gpm	

Key: HP = horsepower; gpm = gallons per minute

In this example, there are 196 existing tanks, ranging in capacity between 172 gallons and 288 gallons, that may be removed from affected facilities and replaced with 196 new tanks sized at a 499-gallon capacity each and equipped with one pump and motor system per tank for a total of 196 units. Of these tanks, the size distribution is as follows: 11 tanks in the 172-gallon size; 100

tanks in the 288-gallon size; and 85 tanks in the 288-gallon size. In addition, there are 415 existing tanks, ranging in capacity between 499 gallons and 1,150 gallons, that may be equipped with one pump and motor system per tank, for a total of 415 units.

As is the case with the forklift cylinder conversions discussed in the previous section, the compliance date is July 1, 2017. However, WPGA assumes that it will take industry about one year to decide how to address complying with PR 1177. Thus, WPGA estimated that conversions would be expected to occur over a more conservative, shortened time-frame – a four-year period (e.g., between July 1, 2013 and July 1, 2017), instead of a five-year period (e.g., June 1, 2012 to July 1, 2017)[10]. To remove 196 tanks over a four-year period, at 260 working days per year, results in an average of 0.18 round trip delivery per day. To provide a more conservative analysis of delivery trips, the average number of truck trips is doubled to provide a peak daily trip rate of up to one round trip deliveries per day. The LPG industry utilizes medium-duty crane trucks (15,000 gross vehicle weight) for removing old tanks and delivering new tanks.

In addition, the manufacturer of the pump and motor system is not necessarily expected to be the same as the manufacturer of the replacement LPG tank. Thus, to install 611 pump and motor systems at 611 facilities, over a four-year period, at 260 working days per year, results in an average of 0.59 round trip delivery per day. To provide a more conservative analysis of delivery trips, the average number of truck trips is doubled to provide a peak daily trip rate of up to one round trip delivery per day.

Based on the aforementioned assumptions, the removal of 196 existing tanks, over a four-year period, at 260 working days per year may result in an average of one tank removal per day or a peak daily "worst-case" of two tank removals per day. Similarly, the delivery of 196 new tanks, over the same four-year period, may result in an average of one tank delivery per day or a peak daily "worst-case" of two tank deliveries per day. Lastly, the delivery of 611 pump and motor systems, over the same four-year period, may result in an average of one pump and motor delivery per day or a peak daily "worst-case" of two pump and motor deliveries per day.

Table 2-7 contains a summary of the peak daily "worst-case" construction emissions from the truck trips and construction activities associated with removing existing LPG storage tanks, and delivering replacement storage tanks, and delivering pumps and motors as part of converting to a pressure-fill system for certain forklift tanks.

[10] Personal communication between Kennard Ellis, SCAQMD and Lesley Brown Garland, Western Propane Gas Association (WPGA), March 8, 2012.

Table 2-7
Peak Daily "Worst-Case" Construction Emissions from the Conversion to a Pressure-Fill System for Forklift Tanks

Peak Construction Activity	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Tank Removal Truck Trips (2 roundtrips per day)	0.41	2.82	3.15	0.01	0.12	0.10
Delivery of replacement Tanks (2 roundtrips per day)	0.41	2.82	3.15	0.01	0.12	0.10
Delivery of pump and motor systems (2 roundtrips per day)	0.41	2.82	3.15	0.01	0.12	0.10
Off-Road Construction Equipment	1.27	4.77	6.87	0.01	0.44	0.41
On-Road Construction Worker Vehicles	0.04	0.43	0.04	0.00	0.01	0.00
On-Road Construction Waste Hauling	0.21	1.41	1.58	0.00	0.06	0.05
Peak TOTAL	**3**	**15**	**18**	**0**	**1**	**1**
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Quarterly Inspections of Bulk Loading Operations

PR 1177 would require LPG providers to conduct quarterly inspections at approximately 200 bulk loading facilities that have one or more storage tanks greater than 10,000 gallons in capacity. The analysis in this EA assumes that these facilities are already conducting inspections as part of their existing fire safety requirements and, thus, PR 1177 would not be expected to create new trips that would be associated with the quarterly inspection requirement. Since there would be no new truck trips that would be associated with these quarterly inspection, no increase in combustion emissions above the existing setting are expected to occur as a result of implementing this portion of PR 1177.

Summary of Construction Assumptions

With respect to analyzing the logistics of implementing these device replacements, a summary of the CEQA assumptions that were applied to the analysis in this EA is shown in Table 2-8.

Table 2-8
Summary of Affected LPG Equipment and CEQA Assumptions for PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date	CEQA Assumptions
Residential Storage Tanks	39,712	Install replacement low emission FLLGs	a. July 1, 2013 for new tanks or existing tanks taken out of service b. July 1, 2017 if documentation provided regarding unsafe retrofit c. July 1, 2015 for all others	a. Each new tank would be already manufactured with a low emission FLLG (e.g., no new trips). For existing tanks taken out of service for other reasons, the retrofit can occur as part of the other service (e.g., no new trips) b. For documented tanks taken out of service for other reasons, the retrofit can occur as part of the other service (e.g., no new trips). c. Existing tanks can be retrofitted during existing service call trip during LPG refills (e.g., no new trips).
Commercial Storage Tanks	5,643	Install replacement low emission FLLGs	a. July 1, 2013 for new tanks or existing tanks taken out of service b. July 1, 2017 if documentation provided regarding unsafe retrofit c. July 1, 2015 for all others	a. Each new tank would be already manufactured with a low emission FLLG (e.g., no new trips). For existing tanks taken out of service for other reasons, the retrofit can occur as part of other service (e.g., no new trips). b. For documented tanks taken out of service for other reasons, the retrofit can occur as part of other service (e.g., no new trips). c. Existing tanks can be retrofitted during existing service call trip during LPG refills (e.g., no new trips).

Table 2-8 (continued)
Summary of Affected LPG Equipment and CEQA Assumptions for PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date	CEQA Assumptions
Barbecue Cylinder	71,000	1. Convert from fill by volume to fill by weight system (3,300 suppliers); 2. Exchange customer's empty cylinder with a full cylinder; 3. Install replacement low emission FLLG on each customer's existing cylinder; or, 4. Customer to purchase new cylinder equipped with low emission FLLG	a. July 1, 2013 for low emission connector retrofit on dispenser b. July 1, 2017 for FLLG retrofit or no new FLLG if fill by weight with existing FLLG closed	a. Installation of each low emission connector can be handled during regular general maintenance of dispenser or as part of a cylinder exchange program (e.g., no new trips). b. Installation of each low emission FLLG can occur during regular general maintenance of dispenser or as part of a cylinder exchange program (e.g., no new trips). However, the timing would be dependent upon when the cylinder needs to be re-certified. For example, new tanks are first certified for 12 years, but after the initial certification, cylinders are required to be re-certified every five years. Further, since the WPGA assumes that 50 percent or 35,500 cylinders are filled-by-weight, only 35,500 cylinders are assumed to need new low emission FLLGs. c. Converting from fill by volume to fill by weight is assumed to affect 20 percent of the 3,300 facilities (e.g., 660 facilities) that are currently suppliers of LPG within the district. Each affected facility is assumed to install a scale equipped with an optional automatic shut-off valve. The analysis assumes that the deliveries of the scales equipped with automatic shut-off valves would create two new round trip truck trips.
Bobtail Trucks	250	Install replacement low emission FLLGs	a. July 1, 2013 for new or leased bobtails b. July 1, 2017 if documentation is provided by July 1, 2013 for pressure test, maintenance, etc.	a. Since hydrotesting of bobtail trucks is currently required at the time of manufacture and again at a DOT-certified testing facility every five years, retrofit of low emission FLLGs can occur when the bobtail is being re-certified (e.g., no new trips). b. Since documented bobtail trucks are also required to undergo hydrotesting at a DOT-certified testing facility every five years, retrofit of low emission FLLGs can occur when the bobtail is being re-certified (e.g., no new trips).

Table 2-8 (continued)
Summary of Affected LPG Equipment and CEQA Assumptions for PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date	CEQA Assumptions
Bobtail Truck Dispensers	250	Install replacement low emission connectors	July 1, 2013	Retrofit of low emission connectors can be done on site by operators or service technicians at the shut-off valve as part of regular maintenance (e.g., no new trips).
Tanker Trucks	100	Install replacement low emission connectors	July 1, 2013	Retrofit of low emission connectors can be done on site by operators or service technicians at the shut-off valve as part of regular maintenance (e.g., no new trips).
Forklift Tanks, not using Gravity Fill	60,000	Install replacement low emission FLLGs	July 1, 2017	Installation of low emission FLLGs can be done during regular general maintenance (e.g., no new trips). However, the timing is dependent upon when the tank needs to be re-certified. For example, new tanks are first certified for 12 years, but after the initial certification, tanks are required to be re-certified every five years.
Forklift Tanks supplied from on-site tank sized between 46 gallons and 125 gallons, using Gravity Fill	2,038	Remove existing tanks and convert to cylinder exchange program	July 1, 2017	The removal of each tank is assumed to correspond to four new round trips per day. In addition, the delivery and exchange of cylinders is assumed to correspond to four new round trips per day.
Delivery Trucks for forklift cylinder exchange program	6	Purchase new delivery trucks needed to specifically accommodate deliveries of forklift cylinders*	July 1, 2017*	Because LPG suppliers may need to deliver cylinders which will offset some deliveries of LPG directly through a bobtail truck (e.g., reduction in old bobtail truck trips) and instead would be delivering filled cylinders and picking up empty cylinders as part of the cylinder exchange program (e.g., equal increase in new cylinder delivery truck trips). Thus, no net increase in new truck trips is anticipated.
Forklift Tanks supplied from on-site tank sized between 172 gallons and 288 gallons, using Gravity Fill	196	Convert to a pressure-fill systems by replacing each existing tank with one larger tank (499 gallon capacity) and installing a pump/motor	July 1, 2017	Existing storage tanks are assumed to be replaced with a larger 499 gallon capacity storage tank equipped with a pump and motor in order to convert to a pressure-fill system. The removal of 196 existing tanks is assumed to result in two new truck trips per day. Similarly, the delivery of 196 new tanks is assumed to result in two new truck trips per day. Lastly, the delivery of 196 pump and motor systems is assumed to result in one new truck trip per day. Thus, a total increase of five new truck trips is assumed to occur.

Table 2-8 (concluded)
Summary of Affected LPG Equipment and CEQA Assumptions for PR 1177 Compliance

Affected LPG Equipment	Number of Affected Units	Compliance Activity	Compliance Date	CEQA Assumptions
Forklift Tanks supplied from on-site tank sized between 499 gallons and 1,150 gallons, using Gravity Fill	415	Convert to a pressure-fill system by installing one pump/motor per existing tank	July 1, 2017	The amount of LPG needed to operate the forklifts is very large such that no tank replacement is assumed to be needed. Instead, the facility operator is assumed to convert the existing tank to a pressure-fill system by retrofitting the tank with a pump and motor. The delivery of 415 pump and motor systems is assumed to result in one new truck trip per day.
Service Dispensers (Hose End from stationary tank to portable tank)	5,000	Install replacement low emission connectors	July 1, 2013	LPG provider would make switch out during regular refill visit (e.g., no new trips).
Bulk Loading Operations with tanks > 10,000 gal	200 (facilities)	Conduct quarterly inspections per year	January 1, 2013	The 800 trips that would be required to conduct quarterly inspections would be incorporated into each facility's regular maintenance schedule (e.g., no new trips).

* While there is no compliance requirement in PR 1177 for LPG providers to buy a new delivery truck for the forklift cylinder exchange program, but the timing by which these new truck purchases are expected to occur will correspond to the July 1, 2017 compliance date for the conversion of forklift tanks sized between 46 gallons and 125 gallons, using gravity fill, to a cylinder exchange program.

Construction Emissions Summary

Since all of the various compliance activities pertaining to implementing PR 1177 are expected to overlap with each other, Table 2-9 contains a summary of all the construction emissions associated with the proposed project.

Table 2-9
Summary of Peak Daily "Worst-Case" Construction Emissions from PR 1177 (All Emission Sources)

Peak Construction Activity	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Barbecue Cylinders: Delivery of Scales/Valves (2 round trips/day)	0	3	3	0.01	0	0
Forklift Cylinder Conversions: Tank Removal Truck Trips (4 roundtrips per day)	1	6	6	0.01	0	0
Forklift Cylinder Conversions: Delivery of replacement cylinders and storage cages (4 roundtrips per day)	1	6	6	0.01	0	0
Forklift Tank Pressure-Fill Conversions: Tank Removal Truck Trips (2 roundtrips per day)	0.41	2.82	3.15	0.01	0.12	0.10
Forklift Tank Pressure-Fill Conversions: Delivery of replacement Tanks (2 roundtrips per day)	0.41	2.82	3.15	0.01	0.12	0.10
Forklift Tank Pressure-Fill Conversions: Delivery of pump and motor systems (2 roundtrips per day)	0.41	2.82	3.15	0.01	0.12	0.10
Forklift Tank Pressure-Fill Conversions: Off-Road Construction Equipment	1.27	4.77	6.87	0.01	0.44	0.41
Forklift Tank Pressure-Fill Conversions: On-Road Construction Worker Vehicles	0.04	0.43	0.04	0.00	0.01	0.00
Forklift Tank Pressure-Fill Conversions: On-Road Construction Waste Hauling	0.21	1.41	1.58	0.00	0.06	0.05
Peak TOTAL	**5**	**29**	**34**	**0**	**1**	**1**
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As a result according to the preceding analysis of potential construction impacts, there would be no significant adverse construction air quality impacts resulting from the proposed project for any criteria pollutants.

Operational Impacts

In order to comply with PR 1177, physical modifications (e.g., the installation of low emission FLLGs and low emission connectors, the conversion of fill by volume for filling barbecue cylinders, and the conversion of gravity-fill systems for filling forklift cylinders), as described above in the "Construction Impacts" section, would need to be made on various LPG storage and transfer equipment to limit the discharge of LPG into the atmosphere. By making these physical

modifications to affected equipment, PR 1177 is estimated to reduce VOC emissions from these sources by 6.1 tons per day upon full implementation. Thus, PR 1177 is expected to have a direct and beneficial VOC emission reductions effect.

It is important to note that once the physical modifications are made during the construction phase, few changes to operational activities are expected. Specifically, of all the compliance activities summarized in Table 2-8, only two categories of LPG affected equipment are expected to experience slight changes from baseline in their daily operational activities, as follows: 1) conversions to a forklift cylinder exchange program; and, 2) conversions to a forklift tank pressure-fill system for existing stationary tanks sized between 172 gallons and 288 gallons.

Operational activities associated with conversions to a forklift cylinder exchange program are expected to change because cylinder truck trips will be needed to accommodate regularly scheduled deliveries of filled replacement cylinders in exchange for empty cylinders. However, since the facilities that convert to a cylinder exchange program would no longer have a stationary LPG storage tank in place, refills of the cylinders would either occur via a delivery of full, replacement cylinders on a cylinder delivery truck or the cylinders could be filled via a regularly scheduled bulk delivery of LPG via a bobtail truck. Since the operational activities will require one new cylinder delivery truck for each of the six LPG suppliers and one less bobtail truck delivery to each customer participating in a forklift cylinder exchange program, there would be no net increase in truck trips for operational activities associated with conversions to a forklift cylinder exchange program. In addition, because trucks delivering cylinders and bobtail trucks delivering bulk LPG are both considered medium-duty trucks with the same emission factors, no change to operational air quality impacts is expected for any bobtail truck trip that is replaced with a cylinder delivery truck trip.

Similarly, changes to operational activities may also occur as a result of conversions to a forklift tank pressure-fill system for existing stationary tanks sized between 172 gallons and 288 gallons because these conversions are expected to result in one new, larger-sized tank (499-gallon capacity) to replace each removal of an existing, smaller storage tank. From an operational point of view, one bobtail truck would still be needed to deliver LPG to fill the stationary, storage tank in one day, but since the replacement storage tank would be sized at a larger capacity, more LPG would be transferred per delivery to fill the tank. Since the receiving facility would have a larger storage capacity, it would take longer to use up the LPG and, thus, bobtail deliveries would occur less frequently on an annual basis. However, the amount of deliveries expected to occur on a peak day would be expected to remain the same.

Lastly, no other criteria pollutants are expected to be directly affected by PR 1177, because of the narrow regulatory focus of PR 1177. Further, since PR 1177 does not alter the existing operating practices of LPG transfer and dispensing activities, no increases in secondary criteria pollutant impacts, such as combustion emissions from air pollution control equipment are expected from the proposed project. Therefore, PR 1177 is not expected to create significant adverse operational air quality impacts.

III.c) The preceding analysis concluded that the increase in construction emissions would create less than significant air quality impacts and a reduction of 6.1 tons per day of operational VOC emissions would not exceed the applicable SCAQMD construction or operational significant thresholds. Since PR 1177 is not expected to create significant adverse air quality impacts, the

proposed project is not expected to be cumulatively considerable as defined in CEQA Guidelines §15064(h)(1) and, therefore, is not expected to create significant adverse cumulative air quality impacts.

III.d) As explained in Section III.b), PR 1177 is estimated to reduce VOC emissions from various sources, including LPG tanks and transfer and dispensing equipment located at or near residences and other sensitive receptors, by 6.1 tons per day upon full implementation. While LPG is not classified as a toxic or as a hazardous air pollutant, it is a regulated substance subject to both the California and Federal Risk Management Plan (RMP) programs in accordance with the California Code of Regulations (CCR), Title 19, §2770.4.1 and Chapter 40 of the Code of Federal Regulations(CFR) Part 68, §68.126. A Risk Management Plan (RMP) is a document prepared by the owner or operator of a stationary source containing detailed information including, but not limited to:

- Regulated substances held onsite at the stationary source;
- Offsite consequences of an accidental release of a regulated substance;
- The accident history at the stationary source;
- The emergency response program for the stationary source;
- Coordination with local emergency responders;
- Hazard review or process hazard analysis;
- Operating procedures at the stationary source;
- Training of the stationary source's personnel;
- Maintenance and mechanical integrity of the stationary source's physical plant; and
- Incident investigation.

The threshold quantity for propane as a regulated substance for accidental release prevention is 10,000 pounds. However, when LPG is used as a fuel by an end user (as is frequently the case with residential portable and stationary storage tanks), or when it is held for retail sale as a fuel, it is excluded from these RMP requirements, even if the amount exceeds the threshold quantity. As such, there are some LPG storage and transfer equipment under PR 1177 that are subject to the RMP requirements and some that are not, irrespective of their location to sensitive receptors.

Trucks delivering cylinders and bobtail trucks delivering bulk LPG are both considered medium-duty trucks with the same emission factors. Fuels for medium duty trucks can include both gasoline and diesel. In 1998, CARB identified diesel particulate matter from internal combustion engines as a toxic air contaminant. Even if all medium duty trucks affected by the proposed project are diesel-fueled trucks, no increases in exposure to diesel particulate matter are expected for the following reasons. For facilities switching to a forklift cylinder exchange program, operational activities would require one new cylinder delivery truck for each of the six LPG suppliers and one less bobtail truck delivery to each customer participating in the forklift cylinder exchange program. This means that there would be no net increase in truck trips for operational activities associated with conversions to a forklift cylinder exchange program. Because deliveries by these medium duty trucks would be offset by an equal reduction in trips previously made by bobtail trucks to deliver bulk LPG to the previous stationary storage tanks, no net increase in truck trips is anticipated to result in response to the purchase of the new trucks and, therefore, no increase in exposure by nearby sensitive receptors, if any, to diesel particulate matter would occur.

Reducing VOC emissions by 6.1 tons per day in the district, PR 1177 is expected to contribute to the SCAQMD's efforts to attain and maintain all state and national ambient air quality standards for ozone, PM10, and PM2.5, throughout the district. Since these standards are health-based standards, improving air quality would also create human health benefits. Because the proposed project will not increase medium duty truck traffic to LPG transfer and dispensing equipment, no increased exposure to diesel particulate matter to nearby sensitive receptors are anticipated. Therefore, PR 1177 is not expected to create significant adverse air quality impacts to sensitive receptors.

III.e) Odor problems depend on individual circumstances, materials involved, and individual odor sensitivities. For example, individuals can differ quite markedly from the population average in their sensitivity to odor due to any variety of innate, chronic or acute physiological conditions. This includes olfactory adaptation or smell fatigue (i.e., continuing exposure to an odor usually results in a gradual diminution or even disappearance of the smell sensation).

Because LPG is odorless, as a fire and safety precaution, to warn users of its presence in the event of leaks, approximately one pound of ethyl mercaptan for every 10,000 gallons of LPG is added as an odorant. Thus, if there is an odor detected during LPG transfer and dispensing activities, there may be a leak and immediate attention would be required to prevent an explosion or fire. As a supplement to existing safety practices currently employed within the LPG industry, PR 1177 contains requirements for leak detection and repair to minimize LPG leaks and in turn, minimize the exposure of people to substantial odors. These requirements combined with the overall effect of reducing 6.1 tons per day of VOC from LPG transfer and dispensing activities will minimize the potential for exposure to odors.

Lastly, as already noted, PR 1177 would only require the limited use of heavy-duty diesel construction equipment for removing existing concrete pads and installing, larger, replacement concrete pads at 196 facilities that convert to a pressure-fill system for existing stationary tanks sized between 172 gallons and 288 gallons that are used for filling forklift cylinders. Because these limited construction activities will occur at 196 existing facilities spread out over four years throughout the district and high emitting heavy-duty construction equipment are not expected to be used for construction activities, no noticeable odor impacts associated with diesel exhaust from either on-road or off-road mobile sources are expected to occur.

For these reasons, PR 1177 is not expected to create new objectionable odors that would affect a substantial number of people.

III.g) & h) Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of greenhouse gas (GHG) emissions in the atmosphere. The six major types of GHG emissions identified in the Kyoto Protocol are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHG emissions absorb longwave radiant energy emitted by the earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect."

Combustion processes generate GHG emissions in addition to criteria pollutants. The following analysis focuses on directly emitted CO2 and CH4 because these are the primary GHG pollutants emitted during the combustion process and are the GHG pollutants for which emission factors are most readily available. CO2 and CH4 emissions were estimated using emission factors from CARB's EMFAC2007 and Offroad2007 models.

The analysis of GHGs is a much different analysis than the analysis of criteria pollutants for the following reasons. For criteria pollutants, the significance thresholds are based on daily emissions because attainment or non-attainment is primarily based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health, e.g., one-hour and eight-hour standards. Since the half-life of CO2 is approximately 100 years, for example, the effects of GHGs occur over a longer term which means they affect the global climate over a relatively long time frame. As a result, the SCAQMD's current position is to evaluate the effects of GHGs over a longer timeframe than a single day. GHG emissions are typically considered to be cumulative impacts because GHG emissions from a single project would have no noticeable effect on global climate. Instead, it is the GHG emissions contributions from multiple projects that affect global climate.

The primary sources of GHG emissions for the proposed project would be from converting LPG suppliers from fill by volume to fill by weight would require construction truck trips associated with the delivery and installation of scales and automatic shut-off valve and the combustion emissions from these truck trips have the potential to increase CO2, N2O, and CH4 emissions, which is typically expressed in CO2 equivalents or CO2e. For the purposes of addressing the GHG emission impacts from PR 1177, the overall impacts of CO2, N2O, and CH4 emissions from the proposed project were estimated and evaluated from initial implementation of the proposed project beginning July 1, 2013 to July 1, 2017[11].

Without employing the VOC emission controls as part of the proposed project, there would be no change to the CO2, N2O, or CH4 emissions baseline over the same time frame. However, implementation of PR 1177 would require some physical changes to affected equipment requiring construction activities. As a result, construction emissions of criteria pollutants and GHGs are expected to be generated by the proposed project. Table 2-10 summarizes the GHG impacts as CO2eq from construction activities. Refer to Appendix B for the GHG calculations.

[11] Even though compliance can begin as soon as the PR 1177 is adopted (e.g., June 1, 2012), WPGA assumes that compliance activities that would involve construction would be expected to occur over a more conservative time-frame – a four-year period (e.g., between July 1, 2013 and July 1, 2017), instead of the five-year period (e.g., June 1, 2012 to July 1, 2017) that would be provided under PR 1177. Personal communication between Kennard Ellis, SCAQMD and Lesley Brown Garland, Western Propane Gas Association (WPGA), March 8, 2012.

Table 2-10
Overall CO2eq Increases Due to Construction Activities

Construction Category	CO2 (lb/day)	CH4 (lb/day[1])	N2O (lb/day[1])	CO2e (lb/day)	CO2eq (MT [2])	CO2eq (MT/project[2])	CO2eq (MT/yr[2, 3])
Barbecue Cylinders	556	0	0	557	0	167	6
Forklift Cylinder Conversions	2,225	0	0	2,227	1	1,802	60
Forklift Tank Pressure-Fill Conversions	2,891	0	0	2,895	1	392	13
GHG Construction TOTAL	**5,673**	**0**	**0**	**5,679**	**3**	**2,360**	**79**
Significance Threshold	n/a	n/a	n/a	n/a	n/a	n/a	**10,000**
Exceed Significance?	n/a	n/a	n/a	n/a	n/a	n/a	**NO**

[1] CH4 and N2O are so low, the net result is substantially less than 1.0 pound per day.
[2] 1 metric ton (MT) = 2,205 pounds
[3] GHGs from construction activities are amortized over 30 years.

Once construction is complete, additional GHG emissions are expected to be generated due to the additional electricity that may be needed to operate the pump/motor systems that would be installed for certain stationary LPG storage tanks that supply forklift tanks. Table 2-11 summarizes the amount of electricity that will be needed to operate the pump/motor systems after converting to pressure fill systems for forklift tanks. Refer to Appendix B for the calculations.

Table 2-11
Electricity Needed to Convert to Pressure-Fill Systems for Forklift Tanks

	Existing Tanks						
	172 gallon	**250 gallon**	**288 gallon**	**499 gallon**	**1,000 gallon**	**1,150 gallon**	**TOTAL**
No. of Facilities	11	100	85	350	5	60	**611**
No. of Existing Tanks to be Removed	11	100	85	0	0	0	**196**
No. of New Replacement Tanks Needed (with 499 gallon capacity)	11	100	85	0	0	0	**196**
No. of Pumps/Motors Needed	11	100	85	350	5	60	**611**
Size of Pumps & Motors Needed in horsepower (HP)	1.25	1.25	1.25	1.25	3	3	**n/a**
Size of Pumps & Motors Needed per Tank in kilowatts (kW)	0.93	0.93	0.93	0.93	2.24	2.24	**n/a**
Fill Rate of Pump in gallons per minute (gpm)	15	15	15	15	35	35	**n/a**
Filling Frequency of New Tanks	once per month (12 days/year)	once per month (12 days/year)	once per month (12 days/year)	once every two weeks (24 days/year)	once every two weeks (24 days/year)	once every two weeks (24 days/year)	**n/a**
Time Needed to Fill 1 Tank when equipped w/pump and motor in hours/day	0.19	0.28	0.32	0.55	0.48	0.55	**n/a**
Electricity Needed to fill All tanks during one day megawatt-hours (MWh/day)	0.0020	0.0259	0.0254	0.1809	0.0053	0.0735	**0.31**

The amount of electricity that the pumps may need can be used to estimate the amount of CO2eq emissions that may be generated as a result of operation activities of the newly installed pump/motor systems for forklift tanks. Table 2-12 summarizes the GHG impacts as CO2eq from pump/motor operation activities. Refer to Appendix B for the GHG calculations.

Table 2-12
Overall CO2eq Increases Due to Operation Activities

Operational GHG Activity	Peak Electricity Demand (MWh/day)	CO2 (MT/yr)	N2O (MT/yr[1])	CH4 (MT/yr[1])	CO2eq (MT/yr [2])
Operation of pump/motor systems[3]	0.31	3.43	0.0000	0.0000	3

[1] CH4 and N2O are so low, the net result is substantially less than 1.0 metric ton per year.
[2] 1 metric ton (MT) = 2,205 pounds
[3] The emission factor is 1,110 lb CO2eq/MWh for electricity when source of power is not identified (CEC, September 6, 2007 - Reporting and Verification of Greenhouse Gas Emissions in the Electricity Sector).

Table 2-13
Summary of Total GHG Emissions as CO2eq Increases Due to PR 1177

	CO2eq from Temporary Construction Activities [1, 2] (MT/yr)	CO2eq from Operational Electricity Use From Pumps/Motors [1] (MT/yr)	Total CO2eq [1] (MT/yr)	CO2eq significance Threshold [1] (MT/yr)	Significant?
TOTAL	**79**	**3**	**82**	**10,000~~0~~**	**NO**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.

GHG Summary

While PR 1177 is not expected to increase the amount of LPG combusted as fuel or alter the manufacturing processes of replacement equipment, PR 1177 would slightly alter the deliveries of replacement equipment needed for construction. Further, in limited situations (e.g., concrete pad removal and replacement), PR 1177 may require the use of some heavy-duty diesel construction equipment. However, because PR 1177 is designed within the current regulatory framework applicable to the LPG industry relative to the timing of inspections and maintenance, PR 1177 will not create new operational truck trips for these purposes. In addition, CO2, N2O, and CH4 emissions would not be expected to change due to the reduction in fugitive LPG emissions because LPG does not contain CO2, N2O, or CH4. Further, PR 1177 does not require an increase in the demand for or the combustion of LPG, so no change in combustion GHG emissions would be expected to occur. Based on the above analysis, PR 1177 has the potential to increase GHG emissions as CO2eq by approximately 82 metric tons per year, which is below the GHG significance threshold of 10,000 metric tons per year for industrial sources. Thus, the GHG impacts that may result from the proposed project are less than significant.

As shown above, overall PR 1177 is not expected to exceed the SCAQMD's GHG significance threshold for industrial projects. On an individual basis, some affected facilities would not be expected to generate GHG emission impacts, while GHG emission impacts, primarily from construction activities at over 600 affected facilities replacing existing tanks with new tanks, would be substantially less than one metric ton per year. If these affected facilities are located in a city or county with an adopted GHG reduction plan, it is unlikely that a GHG emission increase per facility of less than one metric ton per year would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Air Quality and GHG Analysis Conclusion
Based on the preceding evaluation of air quality impacts from PR 1177, SCAQMD staff has concluded that PR 1177 does not have the potential to generate significant adverse air quality and GHG impacts. Since less than significant adverse air quality and GHG impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:				
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Significance Criteria

Impacts on biological resources will be considered significant if any of the following criteria apply:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion

IV. a), b), c), & d) PR 1177 would require low emission FLLGs to be installed on the following types of LPG tanks: residential tanks, commercial tanks, portable tanks, bobtail trucks, and forklift tanks. These installations could be handled in a variety of ways: 1) a new tank, at the time of manufacture, can be equipped with a low emission FLLG; 2) an existing tank that is taken out of service for repair, or part of regularly schedule maintenance such as recertification can be retrofitted with a low emission FLLG as part of that service call or recertification; or, 3) an existing tank can be retrofitted with a low emission FLLG at the time of the next LPG delivery prior to refilling the tank.

PR 1177 would also require the installation of low emission connectors on bobtail trucks, tanker trucks and service dispensers (hoses) that connect between a stationary tank and a portable tank. These installations can be handled in a variety of ways. For example, for bobtail trucks and tanker trucks, the retrofit could be done on site by operators at the shut-off valve as part of regular maintenance. Similarly, to retrofit a service dispenser, the LPG provider can make the switch-out during a regular refill visit.

In each of these examples, the installation of these low emission devices is not expected to be noticeably different in appearance or function relative to the existing FLLGs and connectors. In addition, it is expected that the devices installed would be drop-in replacement units that would not need heavy-duty diesel construction equipment for installation. Instead, hand tools may be used to install the replacement devices.

The conversion of gravity-fill systems for filling forklift cylinders by converting to a cylinder exchange program, fill on-site program, or pressure-fill system may cause some physical changes at affected facilities. These existing facilities would be expected to, depending on tank size, either convert to a cylinder exchange program or a pressure-fill system using a pump and motor per tank.

The conversion to a cylinder exchange program or fill on-site program for the forklift cylinders would mean the removal of smaller existing stationary storage tanks and the installation of a storage cage to hold four to 16 portable cylinders. The conversion to a pressure-fill system could involve the replacement of a medium-sized tank (e.g., within the estimated size range of 172 gallons to 288 gallons) with a larger tank (e.g., 499 gallon capacity) plus a small pump and motor. The tank replacements could require the removal of an existing concrete pad and replacing it with a larger concrete pad. Lastly, for some facilities, the conversion to a pressure-fill system could involve the upgrade of an existing tank (e.g., within the estimated size range of 499 gallons to 1,150 gallons) with a new pump and motor.

It is expected that affected facility operators who choose to replace gravity-fill systems and install a storage cage to hold portable cylinders or replace existing tanks with larger size pressure-fill tanks would perform all modifications within the boundaries of the existing facility. Space requirements for storage cages to hold portable cylinders are relatively small, so cages would likely be placed on the site of the old tank or elsewhere on site as long as a the distance requirements of NFPA 58, §§6.2.2, 6.4.5, and 8.4.1 are adhered to. Similarly, for those affected facility operators who choose to replace existing gravity fill tanks with larger pressure-fill tanks, would likely install the new tank at the same location as the old tank. If for any reason there are space limitations that preclude installing a storage cage to hold portable cylinders or replacing an existing tank with a new larger tank, then the affected facility operators would likely convert to a cylinder exchange program or, in the case of replacing one tank with a second tank, the replacement tank could be the same size as the old tank. It is speculative to assume that affected facility operators would purchase additional land for constructing storage cages to hold portable cylinders or replacing existing tanks with new, larger tanks because additional adjacent land may not be available and the cost of purchasing additional land would likely be substantially greater than conversion to a cylinder exchange program. Therefore, the potential effects of purchasing additional land will not be considered further.

As indicated in the preceding paragraph, it is speculative to assume that affected facility operators would need to acquire land to comply with the provisions of PR 1177. Although, implementing PR 1177 could result in minor construction activities associated with the placement of storage cages to hold portable cylinders or new tanks to replace old tanks, it is expected that any new structures would be built entirely within the boundaries of the existing facility. As a result, implementing PR 1177 is not expected to adversely affect in any way habitats that support riparian habitat, are federally protected wetlands, or are migratory corridors. Similarly, although implementing PR 1177 could result in construction of small structures entirely within the boundaries of existing facilities, special status plants, animals, or natural communities are not expected to be adversely affected by the proposed project.

IV.e) & f) It is not envisioned that PR 1177 would conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans because it is not likely that the proposed project would require acquisition of additional land to convert from

gravity-fill tanks to other compliance options. Further, any construction of any structures would occur entirely within the boundaries of existing facilities, so no development in protected areas is anticipated. Further, PR 1177 would require compliance activities at existing facilities that are located in appropriately zoned areas. Compliance with PR 1177 is not expected to require zoning changes that could affect or conflict with any adopted Habitat Conservation Plans, Natural Community Conservation Plans, or any other relevant habitat conservation plans.

The SCAQMD, as the Lead Agency for the proposed project, has found that, when considering the record as a whole, there is no evidence that PR 1177 would have potential for any new adverse effects on wildlife resources or the habitat upon which wildlife depends. Accordingly, based upon the preceding information, the SCAQMD has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in §753.5 (d), Title 14 of the California Code of Regulations.

Based upon these considerations, significant adverse biological resources impacts are not anticipated and will not be further analyzed in this Draft EA. Since no significant adverse biological resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource, site, or feature?	☐	☐	☐	☑
d)	Disturb any human remains, including those interred outside formal cemeteries?	☐	☐	☐	☑

Significance Criteria

Impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion

V.a), b), c), & d) PR 1177 does not require construction of new buildings or structures, increasing the floor space of existing buildings or structures, or any other construction activities that would require disturbing soil that may contain cultural resources, although in some cases, affected facility operators may choose compliance options that result in minor construction activities as discussed below. The predominate activities expected to occur as a result of PR 1177 is the removal of old and replacement with new low emission FLLGs and low emission connectors on LPG transfer and dispensing equipment. Compliant devices are drop in replacements, so removal and installation would occur primarily using hand tools.

The conversion of gravity-fill systems for filling forklift cylinders by converting to a cylinder exchange program, fill on-site program, or pressure-fill system may cause some physical changes at affected facilities. These existing facilities would be expected to, depending on tank size, either convert to a cylinder exchange program, fill on-site program, or a pressure-fill system using a pump and motor per tank.

The conversion to a cylinder exchange program or fill on-site program for forklift cylinders would mean the removal of smaller existing stationary storage tanks and the installation of a storage cage to hold four to 16 portable cylinders. The conversion to a pressure-fill system could involve the replacement of a medium-sized tank (e.g., within the estimated size range of 172 gallons to 288 gallons) with a larger tank (e.g., 499 gallon capacity) plus a small pump and motor. The tank replacements could require the removal of an existing concrete pad and replacing it with a larger concrete pad. Lastly, for some facilities, the conversion to a pressure-fill system could involve the upgrade of an existing tank (e.g., within the estimated size range of 499 gallons to 1,150 gallons) with a new pump and motor.

Since some tank replacements could require the removal and replacement of an existing concrete pad, some construction-related activities may occur that would minimally disturb soil in order to expand the size of the new concrete pad by a small amount. However, the analysis assumes that the replacement of an existing concrete pad or expansion of an existing concrete pad, if needed, will be in the same location of or immediately adjacent to the previous concrete pad, whose area was previously disturbed.

In general, facilities that would be affected by PR 1177 are existing facilities that are typically located in commercial or industrial areas. Any cultural resources present in such areas would have been highly disturbed in the past due to the original construction and development in the area of roadways, utilities, and other types of infrastructure. Similarly, construction of each affected facility would have caused further disturbances of the each facility's site. Consequently, depending on when the area of each affected facility was developed, any cultural resources encountered in the past would likely have been destroyed. If development occurred in the recent past, there are stringent laws in place with regard how to treat the discovery of culturally significant resources, which include: contingency funding and a time allotment sufficient to allow recovering an archaeological sample or to employ one of the avoidance measures, data recovery through excavation, et cetera. For these reasons, it is unlikely that PR 1177 compliance options that involve minor construction activities, would uncover culturally significant resources at affected facilities.

For the aforementioned reasons, no impacts to historical or cultural resources are anticipated to occur. PR 1177 is not expected to require physical changes to the environment that would disturb paleontological or archaeological resources or disturb human remains interred outside of formal cemeteries. Furthermore, it is envisioned that the areas where the affected devices exist are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed.

Based upon these considerations, significant adverse cultural resources impacts are not expected from implementing PR 1177 and will not be further assessed in this ~~Draft~~ Final EA. Since no significant cultural resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
VI.	**ENERGY.** Would the project:				
a)	Conflict with adopted energy conservation plans?	☐	☐	☑	☐
b)	Result in the need for new or substantially altered power or natural gas utility systems?	☐	☐	☑	☐
c)	Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☐	☑	☐
d)	Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☐	☑	☐
e)	Comply with existing energy standards?	☐	☐	☑	☐

Significance Criteria

Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Discussion

VI.a) & e) Some of the physical modifications that are expected to occur as a result of implementing PR 1177 are the removal of old and replacement with new low emission FLLGs and low emission connectors on various LPG transfer and dispensing equipment. Because of the small size of the replacement parts, the items are expected to be ordered in bulk and combined with a shipment of other items that may be needed to be kept on hand for conducting regular

maintenance. Thus, no increases in supply delivery trips which could increase fuel use are expected.

Once the new low emission FLLGs and low emission connectors are delivered, replacement of these devices are drop in replacements, so removal and installation would occur primarily using hand tools. Thus, no large heavy-duty construction equipment that would need electricity, diesel or gasoline to function would be required to implement this portion of PR 1177. Further, neither the old nor the replacement devices need electricity to function.

The conversion of gravity-fill systems for filling forklift cylinders by converting to a cylinder exchange program, fill on-site program or pressure-fill system may cause some physical changes at affected facilities that would be expected to have a slight energy impact. These existing facilities would be expected to, depending on tank size, either convert to a cylinder exchange program, fill on-site program, or a pressure-fill system using a pump and motor per tank.

The conversion to a cylinder exchange program or fill on-site program for forklift cylinders would mean the removal of smaller existing stationary storage tanks and the installation of a storage cage to hold four to 16 portable cylinders. The conversion to a pressure-fill system could involve the replacement of a medium-sized tank (e.g., within the estimated size range of 172 gallons to 288 gallons) with a larger tank (e.g., 499 gallon capacity) plus a small pump and motor. The tank removal and replacements could require the removal of an existing concrete pad and replacing it with a larger concrete pad. Lastly, for some facilities, the conversion to a pressure-fill system could involve the upgrade of an existing tank (e.g., within the estimated size range of 499 gallons to 1,150 gallons) with a new pump and motor.

Thus, some construction equipment, such as the Bobcat M-series compact excavators, operating on diesel or gasoline fuels would likely be used for any necessary physical modifications. In addition, some supply delivery trips, worker trips, and hauling truck trips are expected to occur as a result of implementing these portions of PR 1177. These trips are expected to increase fuel use (e.g., diesel and gasoline) and this fuel use is summarized in Table 2-14. In addition, because the conversion to pressure fill systems for forklift tanks would require the use of pump/motor systems that need electricity to function, some energy impacts that pertain to slight increases in electricity demand are expected. However, because the penetration of natural gas vehicles into on-road and off-road mobile source fleets has been relatively minor, none of the construction equipment, worker trips or truck trips are expected to be fueled by natural gas, no energy impacts from the use of natural gas are expected.

Energy information, as it relates to construction and operational activities, was derived as part of the air quality analysis in this chapter and are summarized in Table 2-14. The analysis shows an overall increase in diesel and gasoline use during construction of approximately 314 gallons per day and three gallons per day, respectively, and an overall increase in peak electricity demand during operation of 0.31 megawatt-hours per day. The energy calculations are shown in Appendix B of this Final ~~Draft~~ EA.

Table 2-14
Summary of Overall Increases in Energy Use

Equipment Category	Diesel Fuel Usage (gal/day)	Gasoline Fuel Usage (gal/day)	Peak Electricity Demand (MWh/day)
Barbecue Cylinders	33.33	0	0
Forklift Cylinder Conversions	133.34	0	0
Forklift Tank Pressure-Fill Conversions	147.35	3	0.31
TOTAL Usage for Proposed Project	**314**	**3**	**0.31** = 0.01 MW (instantaneous)
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000	8,362 MW [b] (instantaneous)
% of Fuel Supply	0.00003%	0.00000005%	0.0002%
Significant (Yes/No)[c]	No	No	No

[a] Year 2000 California Energy Commission (CEC) projections. Construction activities in future years would yield similar results.

[b] California Energy Demand 2008-2018 Staff Revised Forecast, Staff Final Report, California Energy Commission, , November 2007 (CEC-200-2007-015-SF2). See Form 1.4 b, Peak Demand by LSE: summer Peak Demand Coincident with Planning Area Peak for the following agencies/areas: SCE (Anaheim, Azusa, Banning, Colton, Metropolitan Water District, Rancho Cucamonga, Riverside and Vernon), Cities of Burbank, Glendale and Pasadena, and LADWP. http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDFb

[c] SCAQMD's energy threshold is 1% or more of supply.

KEY:
MWh = megawatt-hour
MW(Megawatt) = 1 MW = 1,000 kilowatts (KW)

Since the proposed project does not exceed the SCAQMD's energy threshold of one percent of supply for both diesel and gasoline fuels and electricity, the proposed project is expected to have less than significant energy demand impacts due to fuel use during construction or electricity demand during operation. Further, once construction is completed, the fuel use projected during construction will end. Increased fuel demand during construction activities to comply with PR 1177 is not considered to be a wasteful use of energy and, therefore, is not considered to be a significant energy impact. Thus, any potential increased fuel demand impacts during construction would be less than what has been analyzed during the peak for the proposed project because once construction is completed, demand for diesel or gasoline fuels for construction of projects to comply with PR 1177 would cease. Similarly, increased electricity demand during operation is not considered to be a wasteful use of electrical energy and therefore, is not considered to be significant.

Since the proposed project does not exceed any of the SCAQMD's energy thresholds of one percent of supply, the proposed project is expected to have less than significant energy impacts. Further, because the increase in electricity demand is below the SCAQMD's energy significance threshold of one percent above available supplies, any increased demand that may result from the proposed project can be met with the existing electrical capacity at each of the affected facilities. Lastly, based on this analysis, it is not anticipated that new or substantially altered power utility systems will need to be built to accommodate any additional electricity demands created by the proposed project.

For the above reasons, even if affected facilities are subject to adopted energy conservation plans or energy standards, implementation of PR 1177 would not be expected to increase demand for electricity during operation or gasoline and diesel fuel use during construction, to the extent that there would be conflicts with adopted energy conservation plans or violate existing energy standards. Additionally, those who manufacture or install PR 1177-compliant devices are expected to comply with any relevant existing energy conservation plans and standards because the manufacture and replacement of compliant devices would likely require the same equipment as is currently used by the LPG industry.

VI.b), c), & d) The manufacturing of compliant replacement devices is expected to create little or no additional demand for energy at affected facilities because activities and practices that involve the manufacturing or application of these compliant devices are already in place and are not expected to change as a result of implementing PR 1177. Based on the analysis in the Section III Air Quality and Greenhouse Gases of this EA, manufacturers are expected to use the same or functionally similar materials to manufacture compliant replacement devices when compared to existing devices. As such, PR 1177 would require little or no additional energy use to manufacture compliant devices and replace old devices. For these reasons, PR 1177 will not increase the demand for energy or require new or modified energy utilities.

Once the new low emission FLLGs and low emission connectors are delivered, replacement of these devices are drop in replacements, so removal and installation would occur primarily using hand tools. Thus, no heavy-duty construction equipment that would need electricity or fuel to function would be required. Further, neither the old nor the replacement devices need electricity, natural gas, gasoline or diesel fuel to function.

However, the conversion to a fill by weight system for barbecue cylinders and the conversion of gravity-fill systems for filling forklift cylinders by converting to either a cylinder exchange program, fill-on site, or pressure-fill system may cause some physical changes at affected facilities and some of these changes would be expected to have a slight energy impact. As indicated in discussion VI. a) & e) above. The analysis shows an overall increase in diesel and gasoline use during construction of approximately 314 gallons per day and three gallons per day, respectively, and an overall increase in peak electricity demand during operation of 0.31 megawatt-hours per day. Further, any potential increased fuel demand impacts during construction would be less than what has been analyzed during the peak for the proposed project because once construction is completed, demand for diesel or gasoline fuels for construction of projects to comply with PR 1177 would cease. Similarly, increased electricity demand during operation is not considered to be a wasteful use of electrical energy and therefore, is not considered to be significant.

In light of the above information and because the primary effect of PR 1177 would be to reduce fugitive emissions of LPG without creating significant construction or operational impacts, PR 1177 would not create any significant adverse effects on peak and base period demands for electricity, natural gas, or other forms of energy, or adversely affect energy producers or energy distribution infrastructure.

Based upon these considerations, PR 1177 is not expected to generate significant adverse energy resources impacts and will not be discussed further in this ~~Draft~~ Final EA. Since less than significant energy impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
VII.	**GEOLOGY AND SOILS.** Would the project:				
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☑
	• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☐	☑
	• Strong seismic ground shaking?	☐	☐	☐	☑
	• Seismic–related ground failure, including liquefaction?	☐	☐	☐	☑
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c)	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☑
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☑
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Significance Criteria
Impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion
VII.a), b), & c) The physical modifications that are expected to occur as a result of implementing PR 1177 is the removal of old FLLGs and connectors and replacement with new low emission FLLGs and low emission connectors on various LPG transfer and dispensing equipment. Replacement of these devices are drop in replacements, so removal and installation would occur primarily using hand tools. Thus, no heavy-duty diesel-fueled construction equipment would be required. Therefore, retrofitting affected equipment with PR 1177-compliant devices is not expected to affect geology or soils.

The manufacture of low emission FLLGs and low emission connectors is expected to occur at existing industrial facilities that already manufacture these devices so no changes to equipment or operations are expected to be necessary to continue to manufacture these compliant devices. The function of the compliant devices is essentially the same the devices being replaced, so effects, if any, on geology or soils would not change compared to the existing setting.

The conversion of gravity-fill systems for filling forklift cylinders by converting to a cylinder exchange program, fill on-site program, or pressure-fill system may cause some physical changes at affected facilities. These existing facilities would be expected to, depending on tank size, either convert to a cylinder exchange program, fill on-~~iste~~site, or a pressure-fill system using a pump and motor per tank.

The conversion to a cylinder exchange program or fill on-site program for forklift cylinders would mean the removal of smaller existing stationary storage tanks and the installation of a storage cage to hold four to 16 portable cylinders. The conversion to a pressure-fill system could involve the replacement of a medium-sized tank (e.g., within the estimated size range of 172 gallons to 288 gallons) with a larger tank (e.g., 499 gallon capacity) plus a small pump and motor. The tank replacements could require the removal of an existing concrete pad and replacing it with a larger concrete pad. Lastly, for some facilities, the conversion to a pressure-fill system could involve the upgrade of an existing tank (e.g., within the estimated size range of 499 gallons to 1,150 gallons) with a new pump and motor.

Since some tank replacements could require the removal and replacement of an existing concrete pad, some construction-related activities may occur that would minimally disturb soil in order to expand the size of the new concrete pad. Because there may be space constraints at affected

facilities and the disturbed area would be very small, small scale equipment, such as the Bobcat M-series compact excavators, would likely be used. The analysis in the "Aesthetics" section concluded that up to nine square feet of area per affected facility could potentially be disturbed as part of replacing or modifying an existing concrete pad. However, the analysis also assumes that the replacement of an existing concrete pad or expansion of an existing concrete pad, if needed, will be in the same location of or immediately adjacent to the previous concrete pad, whose area was previously disturbed and likely, previously graded. Thus, any potential disruption or overcovering of soil is expected to be minimal and limited to previously paved or small new paved areas within existing facilities. To the extent that existing affected facilities are already located on unstable geologic units or soils, this is part of the existing setting. As explained above, there are no provisions in PR 1177 that would adversely affect the stability of local geologic units or soils.

Since PR 1177 would not require the construction of new structures or modify any existing structures, PR 1177 would not expose persons or property to new geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards.

There are no provisions in PR 1177 that would require the construction of new or modified structures or the construction or installation of air pollution control equipment that would call for the changes in topography or surface relief features, the erosion of beach sand, or a change in existing siltation rates. In addition, the proposed project would not require the drilling or removal of underground products (e.g., water, crude oil, etc.) that could produce subsidence effects. Since no major groundwork or earth moving activities would be required as part of implementing PR 1177, no new landslides effects or other changes to unique geologic features would occur.

VII.d) & e) Since PR 1177 is not expected to involve major or substantial earth-moving activities, no persons or property would be exposed to new impacts from expansive soils or soils. Further, because PR 1177 does not require construction of any structures that require wastewater disposal, the installation of septic tanks or other alternative waste water disposal systems is not anticipated as a result of adopting PR 1177.

Based upon these considerations, significant geology and soils impacts are not expected from the implementation of PR 1177 and will not be further analyzed in this Final ~~Draft~~ EA. Since no significant geology and soils impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials?	☐	☐	☑	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑	☐
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
g)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☑	☐
h)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☑	☐

Significance Criteria

Impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Discussion

VIII.a), b), c), & h) PR 1177 would regulate existing and new LPG transfer and dispensing activities at affected facilities and LPG is considered an existing fire hazard. A number of physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, MSDS lists the National Fire Protection Association 704 flammability hazard ratings (i.e., NFPA 704). NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying flammability hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative flammability hazards of a material[12]. Using this standard, LPG is rated "4" as an extreme flammability hazard and is rated "1" for a slight health hazard.

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance's fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each these chemical characteristics.

> Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark. The auto-ignition temperature of LPG is 878 degrees Fahrenheit (470 degrees Centigrade).
>
> Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of vapor bubbles within the liquid. The boiling point of LPG is -40 degrees Fahrenheit (-40 degrees Centigrade).
>
> Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is a represented as a unitless ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates

[12] National Fire Protection Association, FAQ for Standard 704. http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1#23057

generally have an inverse relationship to boiling points, (i.e., the higher the boiling point, the lower the rate of evaporation). The LPG evaporates at a ratio of 272:1 from liquid to vapor.

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. There are different methods that can be used to determine the flashpoint of a solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C.§1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) "Extremely Flammable" if the flash point is below 20 degrees Fahrenheit; 2) "Flammable" if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or, 3) "Combustible" if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

The flash point of LPG is -155 degrees Fahrenheit (-104 degrees Centigrade). Because the flash point is below 20 degrees Fahrenheit, LPG is classified as extremely flammable.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less that 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source. The LEL of LPG is 2.1 percent by volume.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn. The UEL of LPG is 9.5 percent by volume.

> Vapor Pressure: Vapor pressure is an indicator of a chemical's tendency to evaporate into gaseous form. Depending on how LPG is stored, the vapor pressure can range between 23 pounds per square inch gauge (psig) to 132 psig at 70 degrees Fahrenheit (21.1 degrees Centigrade).

While LPG is classified as a fire hazard, it is not classified as a toxic or as a hazardous air pollutant. LPG is a regulated substance subject to both the California and Federal RMP programs in accordance with the CCR, Title 19, §2770.4.1 and Chapter 40 of the CFR Part 68, §68.126[13]. A RMP is a document prepared by the owner or operator of a stationary source containing detailed information including, but not limited to:

- Regulated substances held onsite at the stationary source;
- Offsite consequences of an accidental release of a regulated substance;
- The accident history at the stationary source;
- The emergency response program for the stationary source;
- Coordination with local emergency responders;
- Hazard review or process hazard analysis;
- Operating procedures at the stationary source;
- Training of the stationary source's personnel;
- Maintenance and mechanical integrity of the stationary source's physical plant; and
- Incident investigation.

The threshold quantity for LPG (as propane) as a regulated substance for accidental release prevention is 10,000 pounds. However, when LPG is used as a fuel by an end user (as is frequently the case with residential portable and stationary storage tanks), or when it is held for retail sale as a fuel, it is excluded from these RMP requirements, even if the amount exceeds the threshold quantity. As such, there are some LPG storage and transfer equipment under PR 1177 that are subject to the RMP requirements and some that are not, irrespective of their location to sensitive receptors such as schools.

PR 1177 would regulate existing and new transfer and dispensing activities of LPG only. However, PR 1177 would not cause new LPG transfer and dispensing activities to occur or existing activities to increase. Further, PR 1177 would not cause an increase in the production of LPG to be made available on the market for later transfer and dispensing.

Lastly, while impacts associated with fire hazards would be considered significant if the project creates a significant fire hazard to the public through the use of more flammable materials by consumers, PR 1177 will not increase the use of LPG or cause a switch of the use of LPG to some other fuel type as explained in the following paragraph. Even for those 196 facilities that replace their existing tanks with new larger tanks, PR 1177 will not increase the use of LPG, because the LPG use is based on the demand for fueling the forklift cylinders. Further, for those facilities that replace their existing tanks with new, larger tanks (e.g., 499 gallon), the installation and operation of these larger tanks will still be subject to rigorous permitting, operational and inspection requirements per NFPA standards. For example, LPG tanks sized at 125 gallons or greater require a permit that is renewable every five years and the tanks have to be reinspected by an

[13] The federal RMP program is administered in California through the California Accidental Release Prevention (CalARP) program (Health & Safety Code (H&SC), §§ 25531 to 25543.3 and California Code of Regulations, Title 19 (19 CCR or "Title 19"), §§ 2735.1 to 2785.1).

authorized inspector upon permit renewal. Further, permits are valid for a specific tank at a specific location. If a tank is replaced, the permit is invalid and new permit is required for the new replacement tank. Lastly, LPG tanks sized at 125 gallons or greater are required to be equipped with level gauges and thermometers.

Operators who currently transfer and dispense LPG are well aware of the hazardous nature of LPG, including its flammability and receive periodic training for the safe handling of LPG for the following reasons. Facility operators with a dispensing system for LPG are required to comply with operating pressures pursuant to the standards developed by the American Society of Mechanical Engineers (ASME) Pressure Vessel Code, Section 8; NFPA 58 with regard to venting LPG to the atmosphere; and for LPG tanks that are subject to RMP requirements, the operators must obtain permits from, and submit RMPs to the local Certified Unified Program Agency (CUPA) with is typically the city or county fire department. For similar reasons, industrial and commercial customers on the receiving end of LPG deliveries are also well aware of the safety issues associated with LPG. Residential customers, through warning labels on the portable cylinders and on the units to which the portable cylinders connect, are notified of the flammability dangers associated with LPG. PR 1177 will not cause a change in the existing requirements for the safe handling of LPG in all of these situations.

Reducing VOC emissions by 6.1 tons per day, PR 1177 is expected to contribute to the SCAQMD's efforts to attain and maintain all state and national ambient air quality standards for ozone, PM10, and PM2.5 in the district. Since these standards are health-based standards, improving air quality would also create a human health benefits and may produce slight a slight fire safety benefit by reducing or eliminating the small amounts of vapor that are released to the atmosphere during LPG dispensing, especially to nearby sensitive receptors relative to the location of LPG transfer and dispensing equipment.

Based on the above information, PR 1177 is not expected to create significant adverse hazards and hazardous materials impacts.

VIII.d) Government Code §65962.5 typically refers to a list of facilities that may be subject to Resource Conservation and Recovery Act (RCRA) permits. Since PR 1177 relates to LPG transfer and dispensing activities, PR 1177 is not expected to have direct impacts on facilities affected by Government Code §65962.5. However, if affected facilities are subject to Government Code §65962.5, they would still need to comply with any regulations relating to that code section. The replacement of non-compliant FLLGs and low emission connectors with PR 1177-compliant FLLGs and low emission connectors, the conversion to fill by weight systems for barbecue cylinders, and the conversion to either cylinder exchanges or pressure fill systems for forklift tanks are not expected to generate increased hazardous waste about the existing baseline or interfere with existing hazardous waste management programs. Accordingly, PR 1177 is not expected to result in a new significant impact to the public or environment from sites on lists compiled pursuant to Government Code §65962.5.

Lastly, affected facilities would be expected to continue to manage any and all hazardous materials and hazardous waste, in accordance with federal, state and local regulations.

VIII.e) Since the implementation of PR 1177 is not expected to generate significant adverse new hazardous emissions in general (see the discussions under *III. Air Quality and Greenhouse*

Gas Emissions) or increase the manufacture or use of hazardous materials (see discussion VIII.a), b), c), & h) above), PR 1177 is not expected to increase or create any new safety hazards to people working or residing in the vicinity of public/private airports.

VIII.f) As already noted, low emission FLLGs and low emission connectors would likely be manufactured using the same or functionally similar materials as the current non-compliant LPG flow devices in place today. Further, LPG, irrespective of PR 1177, will continue to be manufactured, transported, stored and used in the same or similar quantities. For these reasons, PR 1177 is not expected to conflict with business emergency response plans. With respect to suppliers and sellers of LPG, Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in the emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

1. Identification of individuals who are responsible for various actions, including reporting, assisting emergency response personnel and establishing an emergency response team;
2. Procedures to notify the administering agency, the appropriate local emergency rescue personnel, and the California Office of Emergency Services;
3. Procedures to mitigate a release or threatened release to minimize any potential harm or damage to persons, property or the environment;
4. Procedures to notify the necessary persons who can respond to an emergency within the facility;
5. Details of evacuation plans and procedures;
6. Descriptions of the emergency equipment available in the facility;
7. Identification of local emergency medical assistance; and
8. Training (initial and refresher) programs for employees in:
    a. The safe handling of hazardous materials used by the business;
    b. Methods of working with the local public emergency response agencies;
    c. The use of emergency response resources under control of the handler; and
    d. Other procedures and resources that will increase public safety and prevent or mitigate a release of hazardous materials.

In general, every county or city and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area. Based on the analysis in VIII.a), b), & c) and VIII.h), PR 1177 will not worsen or change the already hazardous properties of LPG. Therefore, PR 1177 is not expected to impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

VIII.g) Since PR 1177 will not change the amount of LPG that is manufactured, transported, and distributed, implementation of PR 1177 is not expected to increase fire hazards. In actuality, by reducing the amount of released VOCs as fugitive LPG, PR 1177 may reduce the chances for fire hazards that may otherwise occur because of a leak (see VIII. a), b), c) &h)). Further, many of the affected manufacturing, storage, and distributing facilities are located in appropriately zoned commercial or industrial areas, which do not typically include wildlands. For those affected facilities located near wildlands, the facilities would likely be devoid of brush or landscape plants specifically for fire safety reasons. For these reasons, risk of loss or injury associated with wildland fires is not expected as a result of implementing PR 1177. Therefore, PR 1177 is not expected to be significant for exposing people or structures to risk of loss, injury or death involving wildland fires.

Based upon these considerations, significant hazards and hazardous materials impacts are not expected from the implementation of PR 1177. Since no significant hazards and hazardous materials impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards, waste discharge requirements, exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, or otherwise substantially degrade water quality?	☐	☐	☐	☑
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off-site or flooding on- or off-site?	☐	☐	☐	☑
d)	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☑
e)	Place housing or other structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, which would impede or redirect flood flows?	☐	☐	☐	☑
f)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
g)	Require or result in the construction of new water or wastewater treatment facilities or new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
h)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
i) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑

Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases demand for total water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Discussion

IX. a), b), h) & i) Since PR 1177-compliant technologies (e.g., low emission FLLGs and low emission connectors) do not utilize water as part of the LPG transfer and dispensing, no additional water demand or wastewater generation is expected to result from the retrofitting affected units with PR 1177-compliant devices. Because PR 1177 has no provision that would increase demand for water or increase the generation of wastewater, the proposed project would not require the construction of additional water resource facilities, increase the need for new or expanded water entitlements, or alter existing drainage patterns. For these same reasons the proposed project would not substantially deplete groundwater supplies. Therefore, no water demand impacts are expected as the result of implementing PR 1177.

PR 1177 would not require construction of new buildings. Some affected facilities have a compliance option of removing smaller existing gravity-fill stationary storage tanks and replacing them with larger pressure-fill tanks. The analysis in the "Aesthetics" section concluded that up to nine square feet of area per affected facility could potentially be disturbed as part of replacing or modifying an existing concrete pad. Affected facilities that replace existing tanks with new tanks would likely use the same concrete pads or demolish existing pads and construct new pads in approximately the same locations. Consequently, the proposed project is not expected to interfere substantially with groundwater recharge. For these same reasons, PR 1177 would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

Since compliance with PR 1177 does not involve water that would generate wastewater processes, there would be no change in the composition or volume of existing wastewater streams from the affected facilities. For these reasons, PR 1177 is not expected to require additional wastewater disposal capacity, violate any water quality standard or wastewater discharge requirements, or otherwise substantially degrade water quality.

Complying with PR 1177 will not change existing operations at affected facilities, nor would it result in an increased water demand that would cause a generation of increased volumes of wastewater because the water is not required as part of the LPG transfer and dispensing process. As a result, there are no potential changes in water demand or wastewater volume or composition expected from complying with the requirements in PR 1177. Further, PR 1177 is not expected to cause affected facilities to violate any water quality standard or wastewater discharge requirements since there would be no water needed and no wastewater volumes generated as a result of implementing PR 1177.

Since PR 1177 project is not expected to generate significant adverse water quality impacts, no changes to existing wastewater treatment permits, for those facilities that have them, are expected to be necessary. As a result, it is expected that operators of affected facilities would continue to comply with existing wastewater treatment requirements of the applicable Regional Water Quality Control Boards or sanitation districts.

IX. c) & g) PR 1177 would not require construction of new buildings. Some affected facilities have the compliance option of replacing an existing gravity-fill tank with a new larger pressure-fill tank. The analysis in the "Aesthetics" section concluded that up to nine square feet of area per affected facility could potentially be disturbed as part of replacing or modifying an existing concrete pad. Affected facilities that replace existing tanks with new tanks would likely use the same concrete pads or demolish existing pads and construct new pads in approximately the same locations. For these reasons PR 1177 is not expected to increase storm water discharge. For the same reasons PR 1177 would not increase storm water runoff during operation. Therefore, no new storm water discharge treatment facilities or modifications to existing facilities will be required due to the implementation of PR 1177. Accordingly, PR 1177 is not expected to generate any impacts relative to construction of new storm water drainage facilities.

IX. d) Implementation of PR 1177 in industrial and commercial settings would occur at existing facilities that are typically located in areas that are paved and already have drainage infrastructures in place. Since PR 1177 would not involve major construction activities that

would include activities such as site preparation, grading, et cetera, no changes to storm water runoff, drainage patterns, groundwater characteristics, or flow are expected. Therefore, these impact areas are not expected to be affected by PR 1177.

IX. e) & f) The proposed project would not require construction of new housing, contribute to the construction of new building structures, or require modifications or changes to existing structures. Further, PR 1177 is not expected to require additional permanent workers at affected facilities. Therefore, PR 1177 is not expected to generate construction of any new structures in 100-year flood areas as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map. As a result, PR 1177 is not expected to expose people or structures to any new flooding risks, or make worse any existing flooding risks. Finally, PAR 1177 will not affect any potential flood hazards inundation by seiche, tsunami, or mud flow that may already exist relative to existing facilities or create new hazards at existing facilities.

In conclusion, PR 1177 is not expected to have any water demand or water quality impacts for the following reasons:

- The proposed project does not increase demand on the existing water supply.
- The proposed project does not increase demand for total water by more than 5,000,000 gallons per day.
- The proposed project does not increase demand for potable water by more than 262,820 gallons per day.
- The proposed project does not require construction of new water conveyance infrastructure.
- The proposed project does not create a substantial increase in mass inflow of effluents to public wastewater treatment facilities.
- The proposed project does not result in a substantial degradation of surface water or groundwater quality.
- The proposed project does not result in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The proposed project does not result in alterations to the course or flow of floodwaters.

Based on these considerations, significant adverse impacts to hydrology and water quality are not expected to occur from implementing PR 1177. Since there are no significant adverse impacts, no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑

Significance Criteria

Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by local jurisdictions.

Discussion

X.a) There are no provisions in PR 1177 that would require construction or installation of air pollution control equipment. It is expected that compliance with PR 1177 would be achieved primarily through replacing existing FLLGs and connectors with PR 1177-compliant low emission FLLGs and low emission connectors, converting to fill by weight systems for barbecue cylinders, and converting to cylinder exchange or pressure fill systems for filling forklift tanks. Further, because the low emission FLLGs and low emission connectors are drop-in replacements within existing units, no heavy-duty, diesel-fueled construction equipment would be needed. For converting to fill by weight systems for barbecue cylinders, and converting to cylinder exchange or pressure fill systems for forklift tanks, some minor construction activities and additional truck trips may be needed. However, as explained in the *IV. Biological Resources* section, it is expected that affected facility operators who choose to replace gravity-fill systems and install a storage cage to hold portable cylinders or replace existing tanks with larger size pressure-fill tanks would perform all modifications within the boundaries of the existing facility. Further, it is speculative to assume that affected facility operators would purchase additional land for constructing storage cages to hold portable cylinders or replacing existing tanks with new, larger tanks because additional adjacent land may not be available and the cost of purchasing additional land would likely be substantially greater than conversion to a cylinder exchange program. For these reasons and because of the limited scope of these activities as explained previously in the *III. Air Quality and Greenhouse Gas Emissions* discussion, implementation of PR 1177 would not be expected to cause any major modifications that would have the effect of physically dividing an established community.

X.b) There are no provisions in PR 1177 that would affect land use plans, policies, or regulations for the same reasons given in discussion X. a) above. Further, land use and other planning considerations are determined by local governments and no land use or planning requirements would be altered by PR 1177 requirements.

Based upon these considerations, significant land use and planning impacts are not expected from the implementation of PR 1177. Since no significant land use and planning impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XI.	**MINERAL RESOURCES.** Would the project:				
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b)	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☑

Significance Criteria

Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion

XI.a) & b) There are no provisions in PR 1177 that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Some examples of mineral resources are gravel, asphalt, bauxite, and gypsum, which are commonly used for construction activities or industrial processes. Since the main focus of PR 1177 is to replace FLLGs and connectors with low emission FLLGs and low emission connectors, to convert to fill by weight systems for barbecue cylinders, and to convert to either cylinder exchange or pressure fill systems for forklift tanks, PR 1177 would have no effect on the use of important minerals, such as those described above. Therefore, no new demand for mineral resources is expected to occur and significant adverse mineral resources impacts from implementing PR 1177 are not anticipated.

Based upon these aforementioned considerations, significant mineral resources impacts are not expected from the implementation of PR 1177. Since no significant mineral resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XII. NOISE. Would the project result in:				
a) Exposure of persons to or generation of permanent noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☑
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑
c) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
d) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Significance Criteria

Noise impact will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion

XII.a), b), & c) Modifications or changes associated with implementing the proposed project involving construction equipment would typically occur at existing facilities that are located in commercial or industrial settings. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting each facility premises.

It is expected that compliance with PR 1177 would be achieved primarily through replacing existing FLLGs and connectors with low emission FLLGs and low emission connectors, converting to fill by weight systems for barbecue cylinders, and converting to either cylinder exchange or pressure fill systems for forklift tanks. Low emission FLLGs and low emission connectors are drop-in replacements within existing units, so no heavy-duty, diesel-fueled

construction equipment would be needed. Replacement of FLLGs and connectors would not require heavy-duty diesel-fueled construction equipment. Instead, the replacements can be made with hand tools. Neither the hand tools nor the replaced devices generate noise or ground vibration.

Construction activities for the proposed project may generate some noise associated with the use of construction equipment and construction-related traffic. Specifically, while there are no provisions in PR 1177 that would require major construction of new or modified structures or the construction or installation of air pollution control equipment, some minor, short-term construction activities involving off-road equipment and truck deliveries associated with conversions to either cylinder exchange or pressure fill systems for forklift tanks may cause temporary noise impacts on-site during construction. Because of potential size constraints at each affected facility and the small area within each facility that would need to be disturbed, small scale construction equipment such as Bobcat M-series equipment would likely be used. According to the manufacturer[14], noise levels from M-series equipment can be 60 percent lower than comparable equipment. Further, noise levels are reduced by six dBA for each doubling distance from the noise source. If there are structures or walls between the noise source and offsite receptors, noise levels would be reduced even further.

For facility operators who choose to convert to pressure fill systems for forklift tanks, installation of small (e.g., within the range of 1.25 HP to 3.0 HP) pump and motor systems is expected and may be a permanent source of noise at an affected facility. The noise rating for a typical pump and motor system within this size range is approximately 70 decibels (dBA) or less, per unit, which is equivalent to the sound of a vacuum cleaner. The pump and motor systems would be located immediately adjacent to a storage tank within the property lines of each existing affected facility and would only operate when the storage tank is being filled. As shown in Table 2-11, the amount of time it would take to fill the largest tank - a tank sized at 1,150 gallons - with the assistance of a 3.0 HP pump and motor system would be approximately 33 minutes. Further, the analysis assumes the fill frequency for the largest tank to be twice per month or 24 fills per year. As indicated in the construction noise discussion, noise levels are reduced by six dBA for each doubling distance from the noise source and the presence of structures or walls between the noise source and offsite receptors would be reduced noise levels even further. Thus, if pump and motor systems are installed, new noise sources would be present at affected facilities during project, but would unlikely to be distinguishable from other local noise sources.

Nonetheless, noise from the proposed project, whether from construction or operation activities, is not expected to produce noise in excess of current operations measurable at the property line of each of the existing facilities because it is expected that each facility affected will comply with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (CalOSHA) have established noise standards to protect worker health. Because the noise level may increase within an affected facility intermittently and at a level that would not be expected to be noticeable at the property line, PR 1177 is not expected to expose persons to the permanent generation of excessive or prolonged noise levels above current levels where the affected devices are located. Further, because the pumps are relatively small, PR 1177 is not expected to generate substantial ground vibrations.

[14] Bobcat. 2012. Two Big Reasons to get M-powered. http://www.bobcat.com/loaders/models/skidsteer/s850.

In summary, any potential noise increases that may result from implementing PR 1177 are not expected to be noticeable at the property line and further, are expected within the allowable noise levels established by the local noise ordinances for commercial and industrial areas, and thus are expected to be less than significant.

XII.d) Though some of the facilities affected by the proposed project may be located at sites within an airport land use plan, or within two miles of a public airport, the intermittent noise from construction equipment, truck trips, or the operation of pump and motor systems would not expose people residing or working in the project area to an additional degree of excessive noise levels for the same reasons described in discussion XII. a), b), & c) above. Indeed ambient noise levels near airports have the potential to be much higher than other areas because of the noise associated with airplanes landing and taking off. All noise producing equipment must comply with local noise ordinances and applicable OSHA or CalOSHA workplace noise reduction requirements.

Based upon these considerations, significant noise impacts are not expected from the implementation of PR 1177. Since no significant noise impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Significance Criteria

Impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion

XIII.a) & b) The proposed project is not anticipated to generate any significant effects, either direct or indirect, on the district's population or population distribution as no permanent additional workers are anticipated to be required to comply with PR 1177. Replacement of existing FLLGs and connectors with low emission FLLGs and low emission connectors on LPG

transfer and dispensing equipment typically requires one worker as part of an existing service call, which can be accommodated by the existing labor pool in southern California. No additional workers would be required to manufacture the replacement parts needed to comply with PR 1177 because the low emission FLLGs and low emission connectors are already being manufactured and are currently in use and would continue to be used in greater numbers.

PR 1177 may require some minor, short-term construction activities involving off-road equipment and truck deliveries associated with conversions to either cylinder exchange or pressure fill systems for forklift tanks to occur. Specifically, two construction workers may be needed to handle any removal and repouring of concrete pads as part of converting some forklift tanks to pressure fill systems. Because the analysis assumes that at most, it may take five days to remove, re-frame and re-pour concrete, the additional construction workers would be needed on a short-term basis.

Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing PR 1177. As such, PR 1177 would not result in changes in population densities or induce significant growth in population. Further, PR 1177 is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of persons or housing elsewhere in the district.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of PR 1177. Since no significant population and housing impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
XIV. PUBLIC SERVICES. Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
a) Fire protection?	☐	☐	☐	☑
b) Police protection?	☐	☐	☐	☑
c) Schools?	☐	☐	☐	☑
d) Other public facilities?	☐	☐	☐	☑

Significance Criteria
Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion
XIV.a) Potential adverse impacts to fire departments as a result of implementation of PR 1177 are not expected to occur for the following reasons. In general, there are potential fire hazard impacts associated with the storage and handling of LPG because it is classified by the NFPA as a flammable gas and as an extremely flammable liquid (fire rating = 4)[15]. Due to the flammability of LPG, proper handling and storage of LPG is also regulated by the Department of Transportation (DOT) and the Occupational Safety and Health Administration (OSHA) as a hazardous material.

Service technicians for LPG service calls are required to be licensed, which demonstrates that they are knowledgeable regarding the procedures for dismantling and removing LPG tanks, including all of the valves and fittings. They are already highly trained in safety and fire protection procedures due to the highly flammable nature of LPG. For example, service technicians receive training on filling and dispensing procedures for LPG, leak detection, and leak repair. Service technicians are also trained in conducting regular maintenance of equipment used for LPG dispensing and transfer activities. Thus, since the main physical modifications that would occur as a result of implementing PR 1177 would be the replacement of old FLLGs and connectors with low emission FLLGs and low emission connectors, which are functionally identical to the replaced devices, there is no reason to expect that PR 1177 would cause service technicians to need additional fire protection as part of their day-to-day activities. Further, the functionally identical replacement of these devices would not be expected to cause an increase in accidental release of LPG (a hazardous material) such that fire departments would have to respond more frequently to accidental release incidences. In fact, because PR 1177 is expected to reduce or eliminate the small amounts of vapor that are released to the atmosphere during LPG dispensing, there is the potential for a slight reduction in the probability of fires or explosions during dispensing activities.

Conversion to fill by weight systems for barbecue cylinders to pressure-fill systems for forklift tanks would also rely on the same licensed LPG service technicians. In addition to their training in safety and fire protection procedures, LPG service technicians also have expertise with regard to emptying and dismantling any storage tanks, installing new tanks, connecting automatic shut-off valve to barbecue cylinder scales, and connecting pump and motor systems to forklift tanks.

PR 1177 will not increase the amount of LPG (a hazardous and flammable material) to be used at the affected sites or cause a switch of the use of LPG to some other fuel type as explained in the following discussion. In addition, for those 196 facilities that are assumed to replace their existing tanks with new larger tanks, PR 1177 will not increase the use of LPG, because the LPG use is based on the demand for fueling the forklift cylinders and not necessarily, the quantity of

[15] NFPA Flammability Rating: 0 = Not Combustible; 1 = Combustible if heated; 2 = Caution: Combustible liquid flash point of 100^{o} F to 200^{o}F; 3 = Warning: Flammable liquid flash point below 100^{o}F; 4 = Danger: Flammable gas or extremely flammable liquid

LPG stored in the supply tank. Further, for those facilities that replace their existing tanks with new, larger tanks (e.g., 499 gallon), the installation and operation of these larger tanks will still be subject to rigorous permitting, operational and inspection requirements per NFPA standards. For example, LPG tanks sized at 125 gallons or greater require a permit that is renewable every five years and the tanks, as with the replaced tanks, have to be reinspected by an authorized inspector upon permit renewal. Further, permits are valid for a specific tank at a specific location. If a tank is replaced, the permit is invalid and new permit is required for the new replacement tank. Lastly, LPG tanks sized at 125 gallons or greater are required to be equipped with level gauges and thermometers.

Thus, once the new tanks are permitted and inspected, fire departments would not have to conduct additional safety inspections beyond what would already be required as part of the replacement process. Lastly, since it is expected that implementing PR 1177 would not increase the use of LPG (a hazardous and flammable material), there would be no need for new or additional fire fighting resources nor is PR 1177 expected to adversely affect fire departments' abilities to maintain acceptable service ratios, response times or other performance objectives.

XIV.b) Local police departments are also first responders to emergency situations such as fires, for example, to cordon off the area and provide crowd control. As noted in Section VIII.a), b), c) & h), PR 1177 is not expected to significantly increase adverse hazards or hazardous material impacts. Similarly as explained in Section XIV.a), implementing PR 1177 is not expected to increase fire hazards compared to the existing setting. As a result, no significant adverse impacts to local police departments such as maintaining acceptable service ratios, response times or other performance objectives are expected because no increases in hazardous material or fire emergencies are anticipated.

XIV.c) & d) The local labor pool (e.g., workforce) of employees who will be replacing the FLLGs and low emission connectors, removing and installing tanks equipped with pump and motor systems, and connecting automatic shut-off valves to barbecue cylinder scales as part of their day-to-day activities is expected to remain the same since PR 1177 would not trigger substantial changes to current manufacture of the replacement devices or to the number of LPG service calls. Therefore, with no increase in local population anticipated (see discussion "XIII. Population and Housing"), construction of new schools or additional demands on existing schools are not anticipated. Therefore, no significant adverse impacts are expected to local schools.

XIV.e) PR 1177 would not result in the need for new or physically altered facilities, in order to maintain acceptable service ratios. As noted in other sections, PR 1177 is not expected to increase the use of LPG, a hazardous and flammable material that would require public agency oversight or affect in any way public agency service ratios, response times or other performance objectives. Further, there would be no increase in population and, therefore, no need for physically altered government facilities.

Based upon these considerations, significant adverse public services impacts are not expected from the implementation of PR 1177. Since no significant public services impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XV.	**RECREATION.**				
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment or recreational services?	☐	☐	☐	☑

Significance Criteria

Impacts to recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion

XV.a) & b) As discussed under "Land Use and Planning" above, there are no provisions in PR 1177 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments. No land use or planning requirements would be altered by the adoption of PR 1177, which only affects LPG transfer and dispensing equipment at existing facilities. Further, PR 1177 would not affect in any way district population growth or distribution (see Section XIII), in ways that could increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment because it would not directly or indirectly increase or redistribute population.

Based upon these considerations, significant recreation impacts are not expected from the implementation of PR 1177. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XVI. SOLID/HAZARDOUS WASTE. Would the project:				
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑	☐

Significance Criteria

The proposed project impacts on solid/hazardous waste will be considered significant if the following occurs:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion

XVI.a) & b) Compliance with PR 1177 focuses primarily on the replacement of non-compliant FLLGs and connectors used in LPG transfer and dispensing activities with low emission FLLGs and low emission connectors. Because PR 1177 would require old, non-compliant FLLGs and connectors to be replaced with new devices, an increase in the amount of solid waste is expected to be generated when the replacements occur. The composition of the old FLLGs and connectors are typically made of metal such as brass or steel. Thus, any scrap metal generated due to replacements of FLLGs and connectors has economic value and is expected to be recycled. Further, since replacement of these devices would not require the use of hazardous materials, no hazardous materials waste is expected to be generated from implementing PR 1177.

In addition to replacing existing FLLGs and connectors with low emission FLLGs and low emission connectors, PR 1177 may also involve conversions to fill by weight systems for barbecue cylinders, and conversions to cylinder exchange or pressure fill systems for forklift tanks and these conversions may involve some minor construction activities that may generate solid waste.

For example, for barbecue cylinder conversions, an LPG supplier that currently uses a fill by volume system for its stationary storage tank can convert to a fill by weight system. In order to do so, the LPG supplier would need to have a scale that may be equipped with an automatic shut-off valve and the scale would need to be placed adjacent to the existing stationary storage tank so that the automatic shut-off valve (if installed) can be connected to the LPG dispenser. The packaging for the scale and automatic shut-off valve may be considered solid waste, but because it is likely to mostly be comprised of cardboard which has a monetary value, the packaging will likely be recycled, rather than disposed of in a landfill.

For customers or owners of barbecue cylinders, there are three options available to make sure that their cylinders are PR 1177-compliant, as follows: 1) the LPG supplier could exchange each

customer's existing, empty cylinder for a full cylinder at the point of exchange recycle the old cylinder; 2) the LPG supplier could install a replacement low emission FLLG on each customer's existing cylinder at the time when a refill is needed and recycled the old devices; or, 3) the customer could purchase a new cylinder fitted with a low emission FLLG from a retailer and recycle the old cylinder at the point of purchase.

For existing forklift tanks that are currently gravity-filled via an existing stationary storage tank, the operator would have three compliance options available to convert from gravity-fill systems: 1) remove the existing stationary storage tank and convert to a portable forklift cylinder exchange program by buying multiple portable cylinders and installing a cage to store these cylinders; 2) convert to a pressure-fill system by replacing the existing stationary storage tank with a new, larger stationary storage tank that is also equipped with a pump and motor; or, 3) convert to a pressure-fill system by installing a pump and motor on an existing stationary storage tank.

If the operator chooses to remove a tank, it is less likely the removed tank would be disposed of in a landfill because used LPG tanks have economic value. Used LPG tanks are frequently restored or repaired and recertified for reuse elsewhere. For damaged or deteriorated LPG tanks unfit for resale, the tanks can either be disposed of or the metal can be sold for scrap.

It is important to note, however, that even if a tank is removed, there is no requirement in PR 1177 to remove or otherwise disturb the existing concrete pad upon which the LPG tank previously rested. However, if the operator needs to modify or remove an existing concrete pad to make room for a new larger storage tank, for example, the removed concrete would be a new, one-time waste stream. The analysis in the "Aesthetics" section concluded that the largest area of a concrete pad that could be demolished would be approximately 24 square feet for a 250 gallon tank. Assuming the concrete pad is six inches thick, approximately 12 cubic feet or 1.3 cubic yards of construction waste may be generated per tank removed. The analysis estimates that 196 facilities may need to remove the concrete pads that previously supported their LPG storage tanks. Thus, the maximum amount of solid waste that may be generated from demolishing 196 concrete pads from replacing tanks sized between 172 gallons and 288 gallon with larger 499 gallon tanks is approximately 261 cubic yards. For solid waste disposal, facility operators will likely dispose of their solid waste in a landfill located within the district.

Specifically, construction-related waste would be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 48 Class II/Class III landfills within the SCAQMD's jurisdiction. Based on a search of the California Integrated Waste Management Board's Solid Waste Information System (SWIS) on May 16, 2007, the landfills that accept construction waste in Los Angeles, Orange, Riverside and San Bernardino counties have a combined remaining disposal capacity of approximately 750,846,000 cubic yards (1,250,367,507 tons). Thus, 261 cubic yards of solid waste that may be generated by the proposed project represents 0.00003 percent of landfill disposal capacity within the district.

Lastly, PR 1177 is not expected to significantly increase existing waste or generate new waste, either solid or hazardous[16], as a result of manufacturing PR 1177-compliant devices (e.g., low

[16] As explained in Section IX - Hydrology and Water Quality, no liquid wastes are expected to be generated by PR 1177. Further, because the disposal of liquid wastes in landfills is prohibited, the discussion in this section will only focus on solid and hazardous waste.

emission FLLGs and low emission connectors), since manufacturing operations are already using the same or functionally similar materials and disposal methods to produce these devices.

Thus, no hazardous waste products associated with adopting PR 1177 were identified and nonhazardous solid waste impacts specifically associated with PR 1177 are expected to be minor. As a result, no substantial change in the amount or character of solid or hazardous waste streams is expected to occur. For these reasons, PR 1177 is not expected to substantially increase the volume of solid or hazardous wastes from affected facilities, require additional waste disposal capacity, or generate waste that does not meet applicable local, state, or federal regulations.

Based upon these considerations, PR 1177 is not expected to increase the volume of solid or hazardous wastes in amounts that exceed the disposal capacities of existing municipal or hazardous waste disposal facilities or require additional waste disposal capacity. Further, implementing PR 1177 is not expected to interfere with any affected facility's ability to comply with applicable local, state, or federal waste disposal regulations.

Therefore, significant adverse solid or hazardous waste impacts are not expected from the implementation of PR 1177. Since no significant solid/hazardous waste impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
XVII. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☑	☐

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b)	Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☑	☐
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d)	Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e)	Result in inadequate emergency access?	☐	☐	☐	☑
f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☑

Significance Criteria

Impacts on transportation/traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees

- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day
- Increase customer traffic by more than 700 visits per day.

Discussion

XVII.a) & b) The manufacture or use of PR 1177-compliant devices is not expected to adversely affect transportation or traffic. In general, the volumes of PR 1177-compliant devices are not expected to increase when compared to the volumes of non-compliant devices currently used and to be replaced. Thus, the current level of transportation demands related to transporting replacement devices is not expected to increase. PR 1177 is not expected to affect existing operations or use of compliant devices that would change or cause additional worker trips to distribution or retail facilities or increase transportation demands or services. Therefore, since no substantial increase in operational-related trips are anticipated, implementing PR 1177 is not expected to significantly adversely affect circulation patterns on local roadways or the level of service (LOS) at intersections near affected facilities or other sites that use LPG.

Minor construction activities resulting from implementing the proposed project may generate a slight, albeit temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, the delivery of construction materials, and the hauling away of waste materials. Table 2-15 summarizes the truck trips that are assumed to occur during construction. Due to the small number of trips that may be needed during construction activities at affected facilities and the small number of affected facilities that may replace existing tanks, it is highly unlikely that the daily trips would noticeably affect the LOS at any intersection in the vicinity of affected facilities because the trips would be dispersed throughout the district.

Table 2-15
Summary of Construction Truck Trips

PR 1177 Equipment Category	Transportation Activity During Construction	Peak Round Trips per Day
Barbecue Cylinders	Delivery of Scales/Valves	2
Forklift Cylinder Conversions	Tank Removal Truck Trips	4
Forklift Cylinder Conversions	Delivery of replacement cylinders and storage cages	4
Forklift Tank Pressure-Fill Conversions	Tank Removal Truck Trips	2
Forklift Tank Pressure-Fill Conversions	Delivery of replacement Tanks	2
Forklift Tank Pressure-Fill Conversions	Delivery of pump and motor systems	2
Forklift Tank Pressure-Fill Conversions	Off-Road Construction Equipment	1
Forklift Tank Pressure-Fill Conversions	On-Road Construction Worker Vehicles	2
Forklift Tank Pressure-Fill Conversions	On-Road Construction Waste Hauling	1
	TOTAL	**20**
	Significance Threshold	350
	Exceed Significance?	**NO**

Based on the information above, the work force at each affected facility is not expected to increase as a result of the proposed project so no new work commute trips would be generated. Further, as demonstrated in Table 2-15, the proposed project is not expected to cause a

significant increase in construction-related traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities. Also, for the aforementioned reasons, the proposed project is not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during construction .

XVII.c) The height and appearance of the existing structures where the PR 1177-compliant devices would be manufactured or used is not expected be affected in any way because existing vapor control devices are similar in size to compliant devices. For this same reason, installing PR 1177-compliant devices at affected facilities is not expected noticeably affect the height profile of affected facilities. The proposed project has the potential for some affected facility operators to replace a gravity-fill tank with a potentially larger pressure-fill tank. For example, the dimensions of a 250 gallon tank are approximately 7.2 feet wide by 3.3 feet high which is equivalent to a footprint of approximately 24 square feet. As a point of comparison, the dimensions of a 499 gallon tank are approximately 10 feet wide by 3.1 feet high which is equivalent to a footprint of approximately 31 square feet while the dimensions of a 1,150 gallon tank are approximately 8.75 feet wide by 5.0 feet high which is equivalent to a footprint of approximately 43.75 square feet. Consequently, implementation of PR 1177 is not expected to require construction of structures that have the potential to adversely affect air traffic patterns. Further, PR 1177 would not affect in any way air traffic in the region because the compliant FLLGs and low emission connectors are typically shipped via ground transportation and not by air.

XVII.d) The manufacturing and use of PR 1177-compliant devices is meant for LPG transfer and dispensing equipment and, thus, is not expected to require construction or modification of structures or roadways. Further, complying with PR 1177 requirements, which may include replacing existing tanks with new tanks at affected facilities, would also not involve construction or modifications to existing roadways. Consequently, implementing the proposed project would not create roadway hazards or incompatible roadway uses.

XVII.e) Use of PR 1177-compliant devices is not expected to affect or require changes to emergency access at affected facilities or other sites where LPG transfer and dispensing activities occur since PR 1177 would not require construction or physical modifications to any structure associated with manufacturing or selling PR 1177-compliant devices (e.g., low emission FLLGs and low emission connectors). The manufacture and use of PR 1177-compliant devices are specific to LPG transfer and dispensing equipment and, thus, would not be expected to affect businesses' emergency response plans (see discussion in Section VIII.f). Therefore, PR 1177 is not expected to adversely affect emergency access.

XVII.f) No modifications at facilities or other sites where LPG transfer and dispensing activities occur are expected that would conflict with alternative transportation, such as bus turnouts, bicycle racks, et cetera. Although some affected facilities that have LPG transfer and dispensing equipment may be maintenance and fueling stations for public transit buses, installing PR 1177 compliant devices to reduce fugitive emissions is not expected to affect the performance or safety of affected transit facilities (see the *VIII. Hazards and Hazardous Materials* discussion above). Consequently, implementing PR 1177 would not create any conflicts with these modes of transportation.

Based upon these considerations, PR 1177 is not expected to generate significant adverse transportation/traffic impacts. Since no significant transportation/traffic impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☑	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☑	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☑	☐

XVIII.a) As discussed in the "Biological Resources" section of this EA, PR 1177 is not expected to significantly adversely affect plant or animal species or the habitat on which they rely because the proposed project would likely only require the replacement of FLLGs and connectors with low emission FLLGs and low emission connectors on LPG transfer and dispensing equipment at existing sites. Furthermore, it is envisioned that the areas where the affected devices exist are already either devoid of significant biological resources or whose biological resources have been previously disturbed.

The proposed project does not require the acquisition of land to comply with the provisions of PR 1177. Also, implementation of PR 1177 may result in construction of cages to store propane cylinders or new tanks that would replace existing tanks. However, construction of any structures is expected to occur entirely with the boundaries of existing affected facilities. As a result, implementing PR 1177 is not expected to adversely affect in any way habitats that support riparian habitat, are federally protected wetlands, or are migratory corridors. Similarly, since implementing PR 1177 would not require construction of any structures, special status plants, animals, or natural communities and important examples of the major periods of California history or prehistory are not expected to be adversely affected by the proposed project.

XVIII.b) Based on the preceding analyses, PR 1177 is not expected to generate any project-specific significant adverse environmental impacts for the following reasons. The environmental topics checked 'No Impact' (e.g., aesthetics, agriculture and forestry resources, biological resources, cultural resources, geology and soils, hydrology and water quality, land use and planning, mineral resources, population and housing, public services, and recreation) would not be expected to make any contribution to potential cumulative impacts whatsoever. For the environmental topics checked 'Less than Significant Impact' (e.g., air quality, energy, hazards and hazardous materials, noise, solid/hazardous waste, and transportation/traffic), the analysis indicated that project impacts would not exceed any project-specific significance thresholds. Based on these conclusions, incremental effects of the proposed project would be minor and, therefore, are not considered to be cumulatively considerable as defined by CEQA Guidelines §15064(h)(1). Since impacts from the proposed project are not considered to be cumulatively considerable, the proposed project has no potential for generating significant adverse cumulative impacts.

XVIII.c) Based on the preceding analyses, PR 1177 is not expected to cause adverse effects on human beings, either directly or indirectly. Less than significant air quality and greenhouse gases, energy, hazards and hazardous materials, noise, solid/hazardous waste, and transportation/traffic impacts from implementing PR 1177 were identified. PR 1177 would result in a reduction of 6.1 tons of VOC emissions per day by minimizing excess releases of LPG, a VOC as well as a flammable material, into the atmosphere. By minimizing releases of excess LPG into the atmosphere, PR 1177 would also reduce potential existing flammable impacts associated with LPG handling and storage, a benefit.

Based on the discussion in items I through XVIII, the proposed project is not expected to have the potential to cause significant adverse environmental effects to any environmental topic.

APPENDIX A

PROPOSED RULE 1177

In order to save space and avoid repetition, please refer to the latest version of Proposed Rule 1177 located elsewhere in the Governing Board Package. The version of Proposed Rule 1177 that was circulated with the Draft EA and released on April 3, 2012 for a 30-day public review and comment period ending May 2, 2012 was identified as "PR1177-v01-r48."

Original hard copies of the Draft EA, which include the draft version of the proposed rule listed above, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-2039.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

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Worksheet B-12
Barbecue Cylinder Conversions

Activity	**No. of Scales/Auto Shut-off Valves**	**3,300 facilities service barbecue cylinders - 20% currently fill by volume (660 facilities)**
Converting LPG Suppliers from fill by volume systems to fill by weight systems	**1**	**delivery and installation of 660 scales and 660 automatic shut-off valves to occur between 7/1/2013 and 7/1/2017**

average 1 scale-valve/day peak 2 scales-valves/day

Activity	Days/ wk	Wks/ month	Days/ month	Months	Total Days	Crew Size
Delivery of Scale/Valve	5	4.33	21.67	0	1.00	1
			Total	**0**	**1.00**	

Delivery/Installation of Scales/Valves		Number	Number of Round trips/day	Round-trip Distance	Mileage Rate	2013 Mobile Source Emission Factors								
On-Road Equipment Type	Fuel	Needed	Needed	(miles/day)	(miles/ gallon)	VOC (lb/mile)	CO (lb/mile)	NOx (lb/mile)	SOx (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	CO2 (lb/mile)	CH4 (lb/mile)	N2O (lb/hr) *
Medium Duty Delivery Truck (> 8,500 lbs)	diesel	1	1	100	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001

*N2O values are estimated from a ratio of N2O emissions factors to CH4 emission factors (e.g., 0.94) as presented for on-road vehicles in CARB's Regulation for Mandatory Reporting of GHG Emissions.

Incremental Increase in Combustion Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
Medium Duty Delivery Truck (> 8,500 lbs)	0.41	2.82	3.15	0.01	0.12	0.10	556.33	0.02	0.02	**562**	0.26	168.33	6
SUBTOTAL	**0.41**	**2.82**	**3.15**	**0.01**	**0.12**	**0.10**	**556.33**	**0.02**	**0.02**	**562.39**	**0.26**	**168.33**	**5.61**

Equation: No. of Vehicles x Emission Factor (lb/mile) x No. of Round-Trips/Day x Round-Trip length (mile) = Offsite Construction Emissions (lb/day)

Total Incremental Combustion Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
Peak TOTAL	**0**	**3**	**3**	**0**	**0**	**0**	**556**	**0**	**0**	**562**	**0**	**168**	**6**
Significant Threshold	75	550	100	150	150	55	n/a	n/a	n/a	n/a	n/a	n/a	10,000
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**NO**

*1 metric ton (MT) = 2,205 pounds; GHGs from temporary construction activities are amortized over 30 years

Incremental Increase in Fuel Usage From Delivery Trucks	Total Hours	Equipment Type	Diesel Fuel Usage (gal/hr)	Total Diesel Fuel Usage (gal/day)	Total Gasoline Fuel Usage (gal/day)
Medium Duty Delivery Truck (> 8,500 lbs)	N/A	Delivery Truck	N/A	33.33	N/A
			TOTAL	**33**	**0**

Sources:
On-Road Mobile Emission Factors (EMFAC 2007 v2.3), Scenario Year 2013, On-Road Vehicles, Delivery Truck > 8,500 lbs.
http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

Worksheet B-2
Conversions to Forklift Cylinder Exchange

Activity	No. of Tanks	
		2,038 existing tanks in size range between 46 gallons & 125 gallons to be removed from 1,530 facilities
		21,576 new cylinders and 1,530 storage cages will be delivered to 1,530 facilities
		removal and hauling away of existing tanks & delivery of replacement cylinders and storage cages to occur between 7/1/2013 and 7/1/2017
Converting to a Cylinder Exchange Program for Forklift Tanks (sized between 46 gallons and 125 gallons)	1	

					average	2	removed tank/day	peak	4	removed tanks/day
					average	2	delivery trips/day	peak	4	delivery trips/day

Activity	Days/ wk	Wks/ month	Days/ month	Months	Total Days	Crew Size
Haul away removed tank	5	4.33	21.67	0	1.00	1
Deliver Replacement Cylinders/Storage Cages	5	4.33	21.67	0	1.00	1
			Total	0	2	

Removal of existing tanks		Number	Number of Round trips/day	Round-trip Distance	Mileage Rate	2013 Mobile Source Emission Factors								
On-Road Equipment Type	Fuel	Needed	Needed	(miles/day)	(miles/ gallon)	VOC (lb/mile)	CO (lb/mile)	NOx (lb/mile)	SOx (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	CO2 (lb/mile)	CH4 (lb/mile)	N2O (lb/hr) *
Medium Duty (15,000 GVW) crane truck for tank removals	diesel	1	1	100	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001
Medium Duty (>8,000 lbs) delivery truck	diesel	1	1	100	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001

*N2O values are estimated from a ratio of N2O emissions factors to CH4 emission factors (e.g., 0.94) as presented for on-road vehicles in CARB's Regulation for Mandatory Reporting of GHG Emissions.

Incremental Increase in Combustion Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N20 (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
Medium Duty (15,000 GVW) crane truck	0.83	5.63	6.31	0.01	0.24	0.20	1112.65	0.04	0.04	**1125**	0.51	1039.59	35
Medium Duty (>8,000 lbs) delivery truck	0.83	5.63	6.31	0.01	0.24	0.20	1112.65	0.04	0.04	**1125**	0.51	780.459	26
SUBTOTAL	**1.65**	**11.26**	**12.62**	**0.02**	**0.48**	**0.40**	**2225.31**	**0.08**	**0.07**	**2249.56**	**1.02**	**1820.05**	**60.67**

Equation: No. of Vehicles x Emission Factor (lb/mile) x No. of Round-Trips/Day x Round-Trip length (mile) = Offsite Construction Emissions (lb/day)

Worksheet B-23

Conversions to Forklift Cylinder Exchange (concluded)

~~**Conversions to Forklift Pressure Fill (continued)**~~

Total Incremental Combustion Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N20 (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
Peak TOTAL	**2**	**11**	**13**	**0**	**0**	**0**	**2225**	**0**	**0**	**2250**	**1**	**1820**	**61**
Significant Threshold	75	550	100	150	150	55	n/a	n/a	n/a	n/a	n/a	n/a	10,000
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**NO**

*1 metric ton (MT) = 2,205 pounds; GHGs from temporary construction activities are amortized over 30 years

Incremental Increase in Fuel Usage From Delivery Trucks	Total Hours	Equipment Type	Diesel Fuel Usage (gal/hr)	Total Diesel Fuel Usage (gal/day)	Total Gasoline Fuel Usage (gal/day)
Medium Duty (15,000 GVW) crane truck	N/A	Crane Truck	N/A	66.67	N/A
Medium Duty (>8,000 lbs) delivery truck	N/A	Delivery Truck	N/A	66.67	N/A
		TOTAL	**133**	**0**	

Sources:
On-Road Mobile Emission Factors (EMFAC 2007 v2.3), Scenario Year 2013, On-Road Vehicles, Delivery Truck > 8,500 lbs.
http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

Worksheet B-3
Conversions to Forklift Pressure Fill

Activity	No. of Tanks	
		196 existing tanks in size range between 172 gallons & 288 gallons to be removed from 196 facilities 196 new tanks and 611 pump and motor systems to be delivered to 611 facilities removal and hauling away of existing tanks & delivery of replacement tanks plus pumps/motors to occur between 7/1/2013 and 7/1/2017
Converting to a Pressure-Fill System for Forklift Tanks (sized between 172 gallons and 1,150 gallons)	1	

				average	1	removed tank/day	peak	2 removed tanks/day
				average	1	delivery new tank/day	peak	2 deliveries new tanks/day
				average	1	delivery pump & motor/day	peak	2 deliveries pumps & motors/day

Activity	Days/ wk	Wks/ month	Days/ month	Months	Total Days	Crew Size
Haul away removed tank	5	4.33	21.67	0	1.00	1
Deliver Replacement Tank	5	4.33	21.67	0	1.00	1
Deliver Pump/Motor systems	5	4.33	21.67	0	1.00	1
Demo Existing Concrete Pad	5	4.33	21.67	0	1.00	2
Pour New Concrete Pad	5	4.33	21.67	0	5.00	2
			Total	**0**	**9.00**	

Construction Re: Concrete Pad		Rating	Number	Operation Schedule	2013 Off-Road Emission Factors								
Off-Road Equipment Type	Fuel	(hp)	Needed	(hr/day)	VOC (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)	N2O (lb/hr) *
front end loader	diesel	50	1	4	0.1200	0.3641	0.3118	0.0004	0.0292	0.0269	31.1	0.0108	0.0102
concrete saw	diesel	comp.	1	4	0.1002	0.4088	0.5572	0.0007	0.0452	0.0416	58.5	0.0090	0.0085
jack hammer	diesel	comp.	1	4	0.0872	0.3765	0.7938	0.0013	0.0330	0.0304	123	0.0079	0.0074
cement mixer	diesel	comp.	1	4	0.0091	0.0421	0.0556	0.0001	0.0026	0.0024	7.2	0.0008	0.0008

*N2O values are estimated from a ratio of N2O emissions factors to CH4 emission factors (e.g., 0.94) as presented for off-road vehicles in CARB's Regulation for Mandatory Reporting of GHG Emissions.

Removal of existing tanks, delivery of new tanks, and delivery of pumps/motors		Number	Number of Round trips/day	Round-trip Distance	Mileage Rate	2013 Mobile Source Emission Factors								
On-Road Equipment Type	Fuel	Needed	Needed	(miles/day)	(miles/gallon)	VOC (lb/mile)	CO (lb/mile)	NOx (lb/mile)	SOx (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	CO2 (lb/mile)	CH4 (lb/mile)	N2O (lb/mile) *
Medium Duty (15,000 GVW) crane truck for tank removals & deliveries	diesel	1	1	100	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001
Medium Duty (>8,000 lbs) delivery truck for pump & motor systems	diesel	1	1	100	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001
Offsite (Construction Worker Vehicle)	gasoline	2	1	30	20	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001
Medium Duty (>8,000 lbs) waste haul truck	diesel	1	1	100	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001

*N2O values are estimated from a ratio of N2O emissions factors to CH4 emission factors (e.g., 0.94) as presented for on-road vehicles in CARB's Regulation for Mandatory Reporting of GHG Emissions.

Incremental Increase in Onsite Combustion Emissions from Construction Equipment	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
front end loader	0.48	1.46	1.25	0.00	0.12	0.11	124.60	0.04	0.04	**138**	**0.06**	**12**	**0.41**
concrete saw	0.40	1.64	2.23	0.00	0.18	0.17	233.85	0.04	0.03	**245**	**0.11**	**22**	**0.73**
jack hammer	0.35	1.51	3.18	0.01	0.13	0.12	490.65	0.03	0.03	**500**	**0.23**	**44**	**1.48**
cement mixer	0.04	0.17	0.22	0.00	0.01	0.01	28.99	0.00	0.00	**30**	**0.01**	**3**	**0.09**
SUBTOTAL	**1.27**	**4.77**	**6.87**	**0.01**	**0.44**	**0.41**	**878.10**	**0.11**	**0.11**	**913.78**	**0.41**	**81.23**	**2.71**

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)

Incremental Increase in Combustion Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
Medium Duty (15,000 GVW) crane truck - tank removals	0.41	2.82	3.15	0.01	0.12	0.10	556.33	0.02	0.02	**562**	**0.26**	**50**	**1.67**
Medium Duty (15,000 GVW) crane truck - tank deliveries	0.41	2.82	3.15	0.01	0.12	0.10	556.33	0.02	0.02	**562**	**0.26**	**50**	**1.67**
Medium Duty (>8,000 lbs) delivery truck	0.41	2.82	3.15	0.01	0.12	0.10	556.33	0.02	0.01	**559**	**0.25**	**155**	**5.16**
Offsite (Construction Worker Vehicle)	0.04	0.43	0.04	0.00	0.01	0.00	66.05	0.00402	0.00	**66**	**0.03**	**35**	**1.18**
Medium Duty (>8,000 lbs) waste haul truck	0.21	1.41	1.58	0.00	0.06	0.05	278.16	0.01	0.00	**278**	**0.13**	**25**	**0.82**
SUBTOTAL	**1.49**	**10.28**	**11.08**	**0.02**	**0.43**	**0.35**	**2013.20**	**0.07**	**0.04**	**2028.36**	**0.92**	**314.92**	**10.50**

Equation: No. of Vehicles x Emission Factor (lb/mile) x No. of Round-Trips/Day x Round-Trip length (mile) = Offsite Construction Emissions (lb/day)

Total Incremental Combustion Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/project)	CO2eq (MT*/yr)
Peak TOTAL	**3**	**15**	**18**	**0**	**1**	**1**	**2891**	**0**	**0**	**2942**	**1**	**396**	**13**
Significant Threshold	75	550	100	150	150	55	n/a	n/a	n/a	n/a	n/a	n/a	10,000
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**NO**

*1 metric ton (MT) = 2,205 pounds; GHGs from temporary construction activities are amortized over 30 years

Incremental Increase in Fuel Usage	Total Hours	Equipment Type	Diesel Fuel Usage (gal/hr)	Total Diesel Fuel Usage (gal/day)	Total Gasoline Fuel Usage (gal/day)
Medium Duty (15,000 GVW) crane truck - tank removals	N/A	Crane Truck	N/A	33.33	N/A
Medium Duty (15,000 GVW) crane truck - tank deliveries	N/A	Crane Truck	N/A	33.33	N/A
Medium Duty (>8,000 lbs) delivery truck	N/A	Delivery Truck	N/A	33.33	N/A
Medium Duty (>8,000 lbs) Haul truck	N/A	Haul Truck	N/A	3.00	N/A
Operation of Portable Equipment	4	front end loader	3.048	12.19	N/A
Operation of Portable Equipment	4	Concrete Saw	2.68	10.72	N/A
Operation of Portable Equipment	4	jack hammer	2.68	10.72	N/A
Operation of Portable Equipment	4	cement mixer	2.68	10.72	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Vehicles	N/A	N/A	3.00
			TOTAL	**147.35**	**3**

Sources:
1. On-Road Mobile Emission Factors (EMFAC 2007 v2.3), Scenario Year 2013, On-Road Vehicles, Delivery Truck > 8,500 lbs.
http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html
2. Off-Road Mobile Emission Factors, Scenario Year 2012
http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html/offroadEF07_25.xls
3. PM2.5 Significance Thresholds and Calculation Methodology, Appendix A - Updated CEIDARS Table with PM2.5 Fractions
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html/finalAppA.doc

Worksheet B-4
Summary of Construction Emissions

Total Incremental Combustion Emissions by Category	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)	CO2eq (lb/day)	CO2eq (MT*)	CO2eq (MT*/ project)	CO2eq (MT*/yr)
Barbecue Cylinder	**0.41**	**2.82**	**3.15**	**0.01**	**0.12**	**0.10**	**556.33**	**0.02**	**0.02**	**562.39**	**0.26**	**168.33**	**5.61**
Forklift Cylinder Exchange	**1.65**	**11.26**	**12.62**	**0.02**	**0.48**	**0.40**	**2225.31**	**0.08**	**0.07**	**2249.56**	**1.02**	**1820.05**	**60.67**
Forklift Pressure-Fill Conversion	**2.75**	**15.05**	**17.96**	**0.03**	**0.87**	**0.76**	**2891.30**	**0.19**	**0.15**	**2942.15**	**1.33**	**396.14**	**13.20**
Peak Average TOTAL	**5**	**29**	**34**	**0**	**1**	**1**	**5673**	**0**	**0**	**5754**	**3**	**2385**	**79**
Significant Threshold	75	550	100	150	150	55	n/a	n/a	n/a	n/a	n/a	n/a	10,000
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**NO**

*1 metric ton (MT) = 2,205 pounds; GHGs from temporary construction activities are amortized over 30 years

Incremental Increase in Fuel Usage	Total Hours	Equipment Type	Diesel Fuel Usage (gal/hr)	Total Diesel Fuel Usage (gal/day)	Total Gasoline Fuel Usage (gal/day)
Barbecue Cylinder	N/A	Delivery Truck	N/A	33.33	N/A
Forklift Cylinder Exchange	N/A	Delivery Truck	N/A	133.33	N/A
Forklift Pressure Fill	N/A	Various	N/A	147.35	3
			TOTAL	**314**	**3**

Sources:
On-Road Mobile Emission Factors (EMFAC 2007 v2.3), Scenario Year 2013, On-Road Vehicles, Delivery Truck > 8,500 lbs.
http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

Worksheet B-45
Operational Electricity due to Pump/Motor Systems

Existing Tank Size in gallons (gal)	172	250	288	499	1,000	1,150	TOTAL
No. of Facilities	11	100	85	350	5	60	**611**
No. of Existing Tanks to be Removed	11	100	85	0	0	0	**196**
Filling Frequency of Existing Tanks	once every two weeks	once every two weeks	once every two weeks	once every two weeks	once every two weeks	once every two weeks	**n/a**
No. of Concrete Pads to be Demolished and Re-Poured	11	100	85	0	0	0	**196**
No. of New Replacement Tanks Needed (with 499 gallon capacity)	11	100	85	0	0	0	**196**
No. of Pumps/Motors Needed	11	100	85	350	5	60	**611**
Size of Pumps & Motors Needed in horsepower (HP)	1.25	1.25	1.25	1.25	3	3	**n/a**
Size of Pumps & Motors Needed per Tank in kilowatts (kW)	0.93	0.93	0.93	0.93	2.24	2.24	**n/a**
Fill Rate of Pump in gallons per minute (gpm)	15	15	15	15	35	35	**n/a**
Filling Frequency of New Tanks	once per month (12 days/year)	once per month (12 days/year)	once per month (12 days/year)	once every two weeks (24 days/year)	once every two weeks (24 days/year)	once every two weeks (24 days/year)	**n/a**
Time Needed to Fill 1 Tank when equipped w/pump and motor in minutes	11.47	16.67	19.20	33.27	28.57	32.86	**n/a**
Time Needed to Fill 1 Tank when equipped w/pump and motor in hours	0.19	0.28	0.32	0.55	0.48	0.55	**n/a**
Electricity Needed to fill 1 tank during one day kilowatt-hours (kWh/day)	0.18	0.26	0.30	0.52	1.07	1.23	**3.54**
Electricity Needed to fill All tanks during one day kilowatt-hours (kWh/day)	1.96	25.89	25.35	180.88	5.33	73.50	**312.92**
Electricity Needed to fill All tanks during one day megawatt-hours (MWh/day)	0.0020	0.0259	0.0254	0.1809	0.0053	0.0735	**0.31**
Electricity Needed to fill All tanks in one year megawatt-hours (MWh/yr)	0.0235	0.3107	0.3042	2.1706	0.0639	0.8821	**3.76**
Instantaneous Electricity Needed to fill All tanks during one day in megawatts (MW)	0.0001	0.0011	0.0011	0.0075	0.0002	0.0031	**0.0130**
Electricity Significance Threshold: 1% of supply (8362 MW - instantaneous electricity)	0.00000%	0.00001%	0.00001%	0.00009%	0.00000%	0.00004%	**0.0002%**
Significant for Electricity?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Operational GHG Activity	Amount	Units	GHG Emissions Source	CO2 (MT/yr)	N2O (MT/yr)	CH4 (MT/yr)	Total CO2eq (MT/yr)
electricity - increased use for operation of pumps/motors*	0.31	MWh/day	Electricity GHGs	3.43	0.0000	0.0000	3

*1,110 lb CO2eq/MWh for electricity when source of power is not identified (CEC, September 6, 2007 - Reporting and Verification of Greenhouse Gas Emissions in the Electricity Sector)

APPENDIX C

COMMENT LETTER ON THE DRAFT EA AND RESPONSES TO COMMENTS

Comment Letter #1
(Native American Heritage Commission, April 27, 2012)

STATE OF CALIFORNIA — Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

April 27, 2012

Mr. Steve Smith
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: SCH#2012041008; Notice of Completion; draft Environmental Assessment (Negative Declaration) for the **"Proposed Rule 1177 – Liquefied Petroleum Gas Transfer & Dispensing Project;"** located in the South Coast AQMD Jurisdiction, California.

Dear Mr. Smith:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources pursuant to California Public Resources Code §21070 and affirmed by the Third Appellate Court in the case of EPIC v. Johnson (1985: 170 Cal App. 3rd 604).

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law. State law also addresses the freedom of Native American Religious Expression in Public Resources Code §5097.9. 1-1

The California Environmental Quality Act (CEQA – CA Public Resources Code 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. The NAHC did not conduct a Sacred Lands File (SLF) search within the 'area of potential effect (APE), the South AQMD jurisdiction. As you know there are numerous Native American cultural resources in this geographic area of California.

The NAHC "Sacred Sites,' as defined by the Native American Heritage Commission and the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254 (r). 1-2

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries of cultural resources or burial sites once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We strongly urge that you

make contact with the list of Native American Contacts on the attached list of Native American contacts, to see if your proposed project might impact Native American cultural resources and to obtain their recommendations concerning the proposed project. Pursuant to CA Public Resources Code § 5097.95, the NAHC requests cooperation from other public agencies in order that the Native American consulting parties be provided pertinent project information. Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). Pursuant to CA Public Resources Code §5097.95, the NAHC requests that pertinent project information be provided consulting tribal parties. The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and Section 2183.2 that requires documentation, data recovery of cultural resources.

1-2 Cont'd

Furthermore, the NAHC if the proposed project is under the jurisdiction of the statutes and regulations of the National Environmental Policy Act (e.g. NEPA; 42 U.S.C. 4321-43351). Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq*. and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'

1-3

Confidentiality of "historic properties of religious and cultural significance" should also be considered as protected by California Government Code §6254(r) and may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APEs and possibility threatened by proposed project activity.

Furthermore, Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for inadvertent discovery of human remains mandate the processes to be followed in the event of a discovery of human remains in a project location other than a 'dedicated cemetery'.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects.

1-4

Finally, when Native American cultural sites and/or Native American burial sites are prevalent within the project site, the NAHC recommends 'avoidance' of the site as referenced by CEQA Guidelines Section 15370(a).

2

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse

Attachment: Native American Contact List

Native American Contacts
Los Angeles, San Bernardino, Riverside and Orange Counties
April 27, 2012

Cabazon Band of Mission Indians
David Roosevelt, Chairperson
84-245 Indio Springs Cahuilla
Indio , CA 92203-3499
(760) 342-2593
(760) 347-7880 Fax

Soboba Band of Mission Indians
Scott Cozaet, Chairperson; Attn: Carrie Garcia
P.O. Box 487 Luiseno
San Jacinto , CA 92581
carrieg@soboba-nsn.gov
(951) 654-2765
(951) 654-4198 - Fax

Pechanga Band of Mission Indians
Paul Macarro, Cultural Resources Manager
P.O. Box 1477 Luiseno
Temecula , CA 92593
(951) 770-8100
pmacarro@pechanga-nsn.gov
(951) 506-9491 Fax

Torres-Martinez Desert Cahuilla Indians
Mary Resvaloso, Chairperson
PO Box 1160 Cahuilla
Thermal , CA 92274
mresvaloso@torresmartinez.
(760) 397-0300
(760) 397-8146 Fax

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Twenty-Nine Palms Band of Mission Indians
Darrell Mike, Chairperson
46-200 Harrison Place Chemehuevi
Coachella , CA 92236
tribal-epa@worldnet.att.net
(760) 775-5566
(760) 808-0409 - cell - EPA
(760) 775-4639 Fax

San Manuel Band of Mission Indians
James Ramos, Chairperson
26569 Community Center Drive Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX
(909) 864-3370 Fax

Joseph R. Benitez (Mike)
P.O. Box 1829 Chemehuevi
Indio , CA 92201
(760) 347-0488
(760) 408-4089 - cell

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed

Native American Contacts
Los Angeles, San Bernardino, Riverside and Orange Counties
April 27, 2012

Chemehuevi Reservation
Charles Wood, Chairperson
P.O. Box 1976 Chemehuevi
Chemehuevi Valley CA 92363
chair1cit@yahoo.com
(760) 858-4301
(760) 858-5400 Fax

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Admin.
Private Address Gabrielino Tongva
tattnlaw@gmail.com
310-570-6567

Fort Mojave Indian Tribe
Tim Williams, Chairperson
500 Merriman Ave Mojave
Needles , CA 92363
(760) 629-4591
(760) 629-5767 Fax

Colorado River Indian Tribe
Ginger Scott, Museum Curator; Lisa Swick, Coord
26600 Mojave Road Mojave
Parker , AZ 85344 Chemehuevi
crit.museum@yahoo.com
(928) 669-9211-Tribal Office
(928) 669-8970 ext 21
(928) 669-1925 Fax

Ti'At Society/Inter-Tribal Council of Pimu
Cindi M. Alvitre, Chairwoman-Manisar
3094 Mace Avenue, Apt. B Gabrielino
Costa Mesa, , CA 92626
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
GTTribalcouncil@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 -FAX

Juaneno Band of Mission Indians Acjachemen Nation
David Belardes, Chairperson
32161 Avenida Los Amigos Juaneno
San Juan Capistrano CA 92675 m
chiefdavidbelardes@yahoo.
(949) 493-4933 - home
(949) 293-8522

AhaMaKav Cultural Society, Fort Mojave Indian
Linda Otero, Director
P.O. Box 5990 Mojave
Mohave Valley AZ 86440
(928) 768-4475
LindaOtero@fortmojave.com
(928) 768-7996 Fax

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Native American Contacts
Los Angeles, San Bernardino, Riverside and Orange Counties
April 27, 2012

Santa Rosa Band of Mission Indians
John Marcus, Chairman
P.O. Box 391820 Cahuilla
Anza , CA 92539
(951) 659-2700
(951) 659-2228 Fax

Morongo Band of Mission Indians
Michael Contreras, Cultural Heritage Prog.
12700 Pumarra Road Cahuilla
Banning , CA 92220 Serrano
(951) 201-1866 - cell
mcontreras@morongo-nsn.gov
(951) 922-0105 Fax

Augustine Band of Cahuilla Mission Indians
Mary Ann Green, Chairperson
P.O. Box 849 Cahuilla
Coachella , CA 92236
(760) 398-4722
760-369-7161 - FAX

San Manuel Band of Mission Indians
Ann Brierty, Policy/Cultural Resources Departmen
26569 Community Center. Drive Serrano
Highland , CA 92346
(909) 864-8933, Ext 3250
abrierty@sanmanuel-nsn.gov
(909) 862-5152 Fax

Gabrielino Tongva Nation
Sam Dunlap, Chairperson
P.O. Box 86908 Gabrielino Tongva
Los Angeles , CA 90086
samdunlap@earthlink.net

(909) 262-9351 - cell

Torres-Martinez Desert Cahuilla Indians
Diana L. Chihuahua, Vice Chairperson, Cultural
P.O. Boxt 1160 Cahuilla
Thermal , CA 92274
760) 397-0300, Ext. 1209
(760) 272-9039 - cell (Lisa)
(760) 397-8146 Fax

Juaneno Band of Mission Indians Acjachemen Nation
Anthony Rivera, Chairman
31411-A La Matanza Street Juaneno
San Juan Capistrano CA 92675-2674
arivera@juaneno.com
(949) 488-3484
(949) 488-3294 - FAX
(530) 354-5876 - cell

Cabazon Band of Mission Indians
Judy Stapp, Director of Cultural Affairs
84-245 Indio Springs Cahuilla
Indio , CA 92203-3499
markwardt@cabazonIndia

(760) 342-2593
(760) 347-7880 Fax

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Native American Contacts
Los Angeles, San Bernardino, Riverside and Orange Counties
April 27, 2012

Fort Mojave Indian Tribe
Nora McDowell, Cultural Resources Coordinator
500 Merriman Ave — Mojave
Needles , CA 92363
NoraMcDowall@fortmojave.
(760) 629-4591
(760) 629-5767 Fax

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla
Banning , CA 92220 — Serrano
(951) 849-8807
(951) 755-5200
(951) 922-8146 Fax

Juaneno Band of Mission Indians
Alfred Cruz, Cultural Resources Coordinator
P.O. Box 25628 — Juaneno
Santa Ana , CA 92799
alfredgcruz@sbcglobal.net
714-998-0721
714-998-0721 - FAX
714-321-1944 - cell

Pechanga Band of Mission Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula , CA 92593
tbrown@pechanga-nsn.gov
(951) 770-6100
(951) 695-1778 Fax

Juaneno Band of Mission Indians
Adolph 'Bud' Sepulveda, Vice Chairperson
P.O. Box 25828 — Juaneno
Santa Ana , CA 92799
bssepul@yahoo.net
714-838-3270
714-914-1812 - CELL
bsepul@yahoo.net

William J. Pink
48310 Pechanga Road — Luiseno
Temecula , CA 92592
wjpink@hotmail.com
(909) 936-1216
Prefers e-mail contact

Agua Caliente Band of Cahuilla Indians
Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA 92262
lfreogoz@aguacaliente-nsn.gov
(760) 325-3400
(760) 325-0593 Fax

Serrano Nation of Indians
Goldie Walker
P.O. Box 343 — Serrano
Patton , CA 92369

Agua Caliente Band of Cahuilla Indians THPO
Patricia Tuck, Tribal Historic Perservation Officer
5401 Dinah Shore Drive Cahuilla
Palm Springs, CA 92264
ptuck@augacaliente-nsn.gov
(760) 699-6907

(760) 699-6924- Fax

Augustine Band of Cahuilla Mission Indians
Karen Kupcha
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Coachella , CA 92236
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916-369-7161 - FAX

Fort Mojave Indian Tribe
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region9epa@ftmojave.com
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(760) 629-4591
(760) 629-5767 Fax

Pauma & Yuima Reservation
Charles Devers, Cultural Committee
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Pauma Valley CA 92061
paumareservation@aol.com
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Juaneño Band of Mission Indians
Sonia Johnston, Tribal Chairperson
P.O. Box 25628 Juaneno
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714-323-8312
714-998-0721

Juaneno Band of Mission Indians
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Anaheim , CA 92807
neta777@sbcglobal.net
(714) 779-8832

Cahuilla Band of Indians
Chairperson
PO Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
915-763-5549

Pechanga Cultural Resources Department
Anna Hoover, Cultural Analyst
P.O. Box 2183 Luiseño
Temecula , CA 92593
ahoover@pechanga-nsn.gov
951-770-8104
(951) 694-0446 - FAX

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Native American Contacts
Los Angeles, San Bernardino, Riverside and Orange Counties
April 27, 2012

SOBOBA BAND OF LUISENO INDIANS
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Luiseno
San Jacinto , CA 92581
jontiveros@soboba-nsn.gov
(951) 663-5279
(951) 654-5544, ext 4137

Responses to Comment Letter #1
(Native American Heritage Commission, April 27, 2012)

1-1 This comment identifies the Native American Heritage Commission (NAHC) as a trustee agency for the protection and preservation of Native American cultural resources. The comment also identifies laws and regulation pertinent to protecting Native American cultural resources. No further response is necessary.

1-2 This comment refers to the CEQA Guidelines requirement to address archaeological and historical resources in CEQA documents. SCAQMD staff is aware of these requirements and the CEQA document for PR 1177 complies with all relevant CEQA requirements.

This comment also states that the NAHC did not conduct a Sacred Lands File search to identify Native American cultural resources within the area of potential effect (APE), but states that there are numerous Native American cultural resources in geographic area of SCAQMD. However, as explained on pages 2-39 and 2-40 of the Draft EA, potential significant adverse impacts on cultural resources are not anticipated:

> *"In general, facilities that would be affected by PR 1177 are existing facilities that are typically located in commercial or industrial areas. Any cultural resources present in such areas would have been highly disturbed in the past due to the original construction and development in the area of roadways, utilities, and other types of infrastructure. Similarly, construction of each affected facility would have caused further disturbances of the each facility's site. Consequently, depending on when the area of each affected facility was developed, any cultural resources encountered in the past would likely have been destroyed. If development occurred in the recent past, there are stringent laws in place with regard how to treat the discovery of culturally significant resources, which include: contingency funding and a time allotment sufficient to allow recovering an archaeological sample or to employ one of the avoidance measures, data recovery through excavation, et cetera. For these reasons, it is unlikely that PR 1177 compliance options that involve minor construction activities, would uncover culturally significant resources at affected facilities.*
>
> *For the aforementioned reasons, no impacts to historical or cultural resources are anticipated to occur. PR 1177 is not expected to require physical changes to the environment that would disturb paleontological or archaeological resources or disturb human remains interred outside of formal cemeteries. Furthermore, it is envisioned that the areas where the affected devices exist are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed."*

Lastly, this comment recommends the SCAQMD to make early contact with the list of Native American Contacts included as an attachment to the NAHC letter, to identify potential impacts to Native American cultural resources and to work with these contacts to identify any concerns regarding the proposed project. The SCAQMD maintains a specific list of Native American contacts that includes contacts previously provided by the NAHC for other SCAQMD lead agency projects. At the time of release of the Draft EA for public review and comment, the following 43 Native American contacts were provided a Notice of Completion of the Draft EA on April 3, 2012

and at the time of the close of comment period (e.g., May 3, 2012), none have provided comments regarding the proposed project or contacted the SCAQMD in any way:

1. Margaret Park, Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Dr ,Palm Springs, CA 92264, (760) 699-6907, (760) 699-6924 Fax, mpark@aguacaliente-nsn.gov
2. Linda Otero, AhaMaKav Cultural Society, Fort Mojave Indian Tribe, PO Box 5990, Mohave Valley, AZ 86440, (928) 768-4475, (928) 768-7996 Fax
3. Karen Kupcha, Augustine Band of Cahuilla Mission Indians, PO Box 846, Coachella, CA 92236, (760) 365-1373, Cmarvel@kupcha.com
4. Darlene Coombs, Cabazon Band of Mission Indians, 84-245 Indio Springs Parkway, Indio, CA 92203-3499, (760) 342-2593, dcoombes@cabazonindians-nsn.gov
5. John James, Cabazon Band of Mission Indians, 84-245 Indio Springs Parkway, Indio, CA 92203-3499, (760) 342-2593, (760) 347-7880, nmarkwardt@cabazonindians-nsn.gov
6. Judy Stapp, Cabazon Band of Mission Indians, 84-245 Indio Springs Parkway, Indio, CA 92203-3499, (760) 342-2593, (760) 347-7880 fax, jstapp@cabazonindians-nsn.gov
7. Alvino Silva, Cahuilla Band of Indians, 2034 W. Westward, Banning, CA 92220, (951) 849-3450
8. Anthony Madrigal Jr., Cahuilla Band of Indians, PO Box 391761, Anza, CA 92539, (951) 763-2631, (951) 763-2632 fax, environmental@cahuilla.net
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12. Michael Tsosie, Colorado River Reservation, 26600 Mojave Rd, Parker, AZ 85344, (928) 208-4211
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SCAQMD staff will update the above contact list to reflect any additions or revisions as provided in the attachment to NAHC's comment letter so that notices pertaining to future SCAQMD lead agency projects can be transmitted accordingly. However, it would be helpful in the future if the list NAHC provides could be checked for completeness and accuracy prior to transmittal, as it appears that there are multiple entries with incomplete information, such as missing affiliations and truncated or incorrect email addresses. For example, the contact information for Mary Resvaloso, Joseph Benitez, David Belardes, Judy Stapp, Nora McDowell, Adolph 'Bud' Sepulveda, Sonia Johnson, and Mark Macarro contain incomplete and/or inconsistent information. SCAQMD staff

requests the NAHC to provide corrected information for these individuals so that the contact list can be fully and accurately updated. In addition, the SCAQMD's area of jurisdiction is defined in SCAQMD Rule 103 – Definition of Geographical Areas[17]. SCAQMD staff recommends that the NAHC review SCAQMD Rule 103 and, if any tribal contacts within the area of SCAQMD's jurisdiction are not already included in the SCAQMD's Native American contact list (see above), provide that list to SCAQMD staff so the additional contacts can receive future notices of SCAQMD CEQA projects.

1-3 This comment recommends the SCAQMD to consult with tribes and interested Native American consulting parties on the NAHC list if the proposed project is subject to the requirements of the National Environmental Policy Act (NEPA). The proposed project is not under federal jurisdiction and, therefore, is not subject to the requirements in NEPA. However, as mentioned in Response to Comment 1-2, the SCAQMD evaluated the potential for impacts to Native American sites and concluded that such sites would not be adversely affected by PR 1177. Further, the SCAQMD provided a Notice of Completion of the Draft EA of the proposed project to all of the parties included on the NAHC's contact list on April 3, 2012.

1-4 This comment cites PRC §5097.98, California Government Code §27491 and Health and Safety Code §7050.5, which all include provisions for accidental discovery of archaeological resources during construction. As explained in Response to Comment 1-2, the proposed project is not expected to have any impact on historic properties of religious and cultural significance, human remains, or Native American cemeteries. As a result, no impacts to historical, archaeological or paleontological resources (as defined in §15064.5 of the CEQA Guidelines) are expected as a result of implementation of the proposed project. Thus, with no impacts to historical, archaeological or paleontological resources, no mitigation measures, such as "avoidance of the site" per CEQA Guidelines §15370(a), are required.

Lastly, this comment recommends that consultation between tribes, lead agencies, project proponents, and their contractors should occur. As noted in Response 1-2, the SCAQMD maintains a comprehensive list of Native American contacts in the southern California region. The Native American contacts on this list receive notices for all projects were the SCAQMD is lead agency. With regard to Native American tribes and organizations contacted about the proposed project, refer to Response to Comment 1-2.

[17] http://www.aqmd.gov/rules/reg/reg01/r103.pdf

ATTACHMENT H

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Socioeconomic Assessment for Proposed Rule 1177─Liquified Petroleum Gas Transfer and Dispensing June 2012

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

GOVERNING BOARD

Chairman: DR. WILLIAM A. BURKE
Speaker of the Assembly Appointee

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Mayor, Chino
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EXECUTIVE OFFICER:

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EXECUTIVE SUMMARY

A socioeconomic analysis was conducted to assess the impacts of Proposed Rule 1177─Liquefied Petroleum Gas Transfer and Dispensing. A summary of the analysis and findings is presented below.

Elements of Proposed Rule	Proposed Rule 1177 (PR 1177) requires the use of liquefied petroleum gas (LPG) low emission connectors for transfer and dispensing of LPG. PR 1177 would also require that LPG-receiving containers be equipped with a low emission fixed liquid level gauge (FLLG) or an equivalent technique or technology. The owner/operator of an LPG bulk station & terminal would be required to implement leak detection and repair program that includes quarterly inspections of connectors, inspections and repairs of FLLGs and connectors, maintain records of installation, and report monthly LPG purchase and dispensing volumes, annually, for three years. PR 1177 would reduce 6.1 tons of fugitive VOC emissions per day by 2017.
Affected Facilities and Industries	Proposed Rule 1177 would affect 25 LPG dealers/distributors (NAICS 454312), 200 LPG bulk stations & terminals (NAICS 424710), and an estimated 660 retail facilities that refill barbecue cylinders in the four-county area that would opt to fill cylinders by weight on site. Out of these 660 retail facilities it is estimated that one-half belong to gasoline stations (NAICS 447190) and the other half belong to the sector of general rental centers (NAICS 532310). The majority of the affected facilities are small businesses.
Assumptions of Analysis	It is assumed that low emission connectors would be installed on 250 bobtail trucks, 100 tanker or transport trucks, and 5,000 service dispensers (hoses) by 25 LPG dealers/distributors. It is also assumed that the 25 LPG dealers/distributors would install FLLGs on LPG storage tanks and cargo tanks. It is further assumed that the existing 71,000 barbecue cylinders that are filled by volume would be replaced by new cylinders already fitted with the low emission FLLGs over a period of five years. The owners/operators that use the gravity filling process to fill forklift cylinders are assumed to explore the following compliance options: 1) replacing smaller (46 gallons to 125 gallons) stationary storage tanks with forklift cylinders through an exchange program; 2) replacing existing storage tanks ranging from 172 gallons to 288 gallons with a larger (500 gallon) storage tank equipped with a pump and motor to speed up the filling; and 3) adding a pump and motor to existing stationary storage tanks that range in capacity from 499 gallons to 1,150 gallons. It is estimated that 660 gas stations and rental facilities would opt to utilize a fill-by-weight, on-site option and would thus purchase scales to comply with PR 1177. Finally, the 200 LPG bulk stations & terminals would be required to conduct

	quarterly inspections of connectors, maintain records, and report monthly LPG purchase and dispensing volumes, annually, for three years.
Compliance Costs	The total average annual cost of PR 1177 is estimated to be $4.28 million (from 2013-2025). The cost analysis is conservative in that the projected VOC reductions may be captured and thus reduce product loss to the air and offset a portion of the cost estimated herein. The costs of low emission connectors and FLLGs are projected to be $0.35 million and $0.96 million, respectively. The cost to comply with PR 1177 for gravity fill forklift cylinders is estimated to be $1.76 million. The cost of leak detection, recordkeeping, and reporting requirements is projected to be $1.21 million. Out of $4.28 million cost, LPG dealers/distributors would incur about $3 million (70 percent of the total cost) at $120,000 per dealer/distributor. The average annual cost to LPG bulk stations & terminals is estimated to be $1.21 million (or about $6,060 per facility). The average annual cost incurred by gasoline stations and general rental centers is estimated to be $0.07 million (or about $106 per facility). Implementation of PR 1177 will reduce fugitive LPG product loss during transfer and dispensing and this equates to both air quality benefits as well as potential cost-savings for the LPG industry and consumers. PR 1177 will result in 6.1 tons of VOC emission reductions per day. This reduction would translate to about 3,000 gallons of LPG product savings per day. Assuming LPG cost of $3 per gallon, the savings due to reduced product loss can be as high as $3.3 million per year and could potentially offset a significant fraction of the estimated implementation costs as well as the job impact associated with this proposed rule.
Jobs and Other Socioeconomic Impacts	The secondary and induced impacts of the proposed rule are analyzed using the Regional Economic Models, Inc. (REMI) model, which includes published historical and projected economic data. PR 1177 is expected to result in jobs creation during the first three years of its implementation, and jobs forgone in later years. Overall, 21 jobs could be forgone annually, on average, between 2013 and 2025, which is 0.0002 percent of the baseline jobs in the four-county area. The sectors of construction, fabricated metal product manufacturing, machinery manufacturing, and professional and technical services would experience modest job growth during the initial years of rule implementation. The retail trade sector where the affected LPG dealers/distributers and gas stations belong would experience 14 jobs forgone due to the additional cost of doing business incurred by them. The remaining sectors would incur minor job impact. It is projected that the retail trade sector would experience a rise in its relative cost of services by 0.0029 percent and a rise in its delivered price by 0.0023 percent in 2017.

INTRODUCTION

Proposed Rule 1177 (PR 1177) requires the use of liquefied petroleum gas (LPG) low emission connectors for transfer and dispensing of LPG. PR 1177 would also require that LPG-receiving containers be equipped with a low emission fixed liquid level gauge (FLLG) or equivalent techniques or technology. Owners/operators of LPG bulk stations & terminals would be required to conduct quarterly inspections of connectors, maintain records of installation, inspections and repairs of FLLGs and connectors, and report monthly LPG purchase and dispensing volumes, annually, for three years. PR 1177 would reduce approximately 6.1 tons of fugitive VOC emissions per day by 2017.

LEGISLATIVE MANDATES

The socioeconomic assessments at the South Coast Air Quality Management District (AQMD) have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed rule include the AQMD Governing Board resolutions and various sections of the California Health & Safety Code (H&SC).

AQMD Governing Board Resolutions

On March 17, 1989 the AQMD Governing Board adopted a resolution that calls for preparing an economic analysis of each proposed rule or amendment for the following elements:

- Affected Industries
- Range of Control Costs
- Cost Effectiveness
- Public Health Benefits

On October 14, 1994, the Board passed a resolution which directed staff to address whether the proposed rules or amendments brought to the Board for adoption are in the order of cost effectiveness as defined in the AQMP. The intent was to bring forth those rules that are cost-effective first.

Health & Safety Code Requirements

The state legislature adopted legislation that reinforces and expands the Governing Board resolutions for socioeconomic assessments. H&SC Sections 40440.8(a) and (b), which became effective on January 1, 1991, require that a socioeconomic analysis be prepared for any proposed rule or rule amendment that *"will significantly affect air quality or emissions limitations."* Specifically, the scope of the analysis should include:

- Type of Affected Industries
- Impact on Employment and the Economy of the Basin
- Range of Probable Costs, Including Those to Industries
- Emission Reduction Potential

- Necessity of Adopting, Amending or Repealing the Rule in Order to Attain State and Federal Ambient Air Quality Standards
- Availability and Cost Effectiveness of Alternatives to the Rule

For the emission reduction potential and necessity of adopting the proposed rule as well as availability and cost effectiveness of alternatives to the proposed rule, please refer to the Staff Report of Proposed Rule 1177. Additionally, the AQMD is required to actively consider the socioeconomic impacts of regulations and make a good faith effort to minimize adverse socioeconomic impacts. H&SC Section 40728.5, which became effective on January 1, 1992, requires the AQMD to:

- Examine Business and Small Business Impacts; and
- Consider Socioeconomic Impacts in Rule Adoption

H&SC Section 40920.6, which became effective on January 1, 1996, requires that incremental cost effectiveness be performed for a proposed rule or amendment relating to ozone, carbon monoxide (CO), oxides of sulfur (SO_x), oxides of nitrogen (NO_x), and their precursors. Incremental cost effectiveness is defined as the difference in costs divided by the difference in emission reductions between one level of control and the next more stringent control. Incremental cost effectiveness analysis is presented in the Staff Report prepared for the proposed rule.

AFFECTED INDUSTRIES

Proposed Rule 1177 would affect 25 LPG dealers/distributors (NAICS 454312), 200 LPG bulk stations & terminals (NAICS 424710), and 660 retail facilities that refill barbecue cylinders in the four-county area. Out of the 660 retail facilities one-half belong to gasoline stations (NAICS 447190) and the other half belong to the sector of general rental centers (NAICS 532310).

Small Businesses

The AQMD defines a "small business" in Rule 102 as one that employs 10 or fewer persons and that earns less than $500,000 in gross annual receipts. In addition to the AQMD's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments (CAAA) of 1990, and the California Department of Health Services (DHS) also provide definitions of a small business.

The SBA's definition of a small business uses the criteria of gross annual receipts (ranging from $0.75 million to $35.5 million), number of employees (ranging from 50 to 1,500), megawatt hours generated (4 million), or assets ($175 million), depending on industry type (US SBA, 2010). The SBA definitions of small businesses vary by 6-digit North American Industrial Classification System (NAICS) code.

The CAAA classifies a facility as a "small business stationary source" if it: (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either VOC or NOx, and (3) is a small business as defined by SBA.

A LPG dealer/distributor (NAICS 454312) with fewer than 50 employees is considered small by SBA. Out of the 25 LPG gas dealers/distributors in the district, information on employees and sales for 20 facilities is available, based on the 2012 Dun and Bradstreet data. Under the AQMD definition of small business, nine LPG dealers/distributors are considered small. The affected LPG dealers/distributors and the LPG bulk stations & terminals (NAICS 424710) are under the same ownership. For the purpose of the SBA small business evaluation, the small business threshold criteria apply to all the facilities as a whole under the common ownership. Based on the SBA and CAAA definition of small businesses, there are 19 small businesses, assuming that all the affected facilities emit less than 10 tons of VOC or NOx. There is no emission data on these 19 facilities.

Since there is no listing of individually affected retail facilities that refill barbecue cylinders (service stations and general rental centers), the number of affected small businesses cannot be determined. However, due to the fact that the majority of the businesses in this sector are small shops, many of them could potentially be small businesses.

COMPLIANCE COST

PR 1177 requires the use of LPG low emission connectors for transfer and dispensing of LPG to limit the discharge of LPG upon disconnection. PR 1177 would also require that LPG-receiving containers be equipped with low emission FLLGs or use an equivalent alternative technique or technology. LPG bulk stations & terminals are required to conduct quarterly inspections, maintain records of installation, inspections and repairs of FLLGs and connectors, and report monthly LPG purchase and dispensing volumes for three years.

The total average annual cost of PR 1177 is estimated to be $4.28 million (from 2013-2025). The cost analysis is conservative in that the projected VOC reductions may be captured and thus reduce product loss to the air and offset a portion of the cost estimated herein. Table 1 shows the $4.28 million cost by sector and cost per affected facility. LPG dealers/distributors would incur about 70 percent of the annual compliance cost of PR 1177. The cost impacts on gasoline stations and general rental centers are minimal.

Table 1
Average Annual Cost of Proposed Rule 1177 by Industry
(in millions of dollars)

Affected Industries	2013	2015	2020	2025	Average Annual Cost (2013-2025)	Average Cost per Facility (or Dealer/Distribution) *
LPG Dealers/Distributors	$1.299	$2.354	$3.409	$3.409	$3.003	$120,000
LPG Bulk Stations & Terminals	$1.520	$1.520	$1.120	$1.120	$1.212	$6,060
Gasoline Stations	$0.008	$0.024	$0.041	$0.041	$0.034	$106
General Rental Centers	$0.008	$0.024	$0.041	$0.041	$0.034	$106
Total	**$2.836**	**$3.923**	**$4.610**	**$4.610**	**$4.284**	

*in dollars

Low Emission Connectors

PR 1177 would require the installation of low emission connectors on about 250 bobtail trucks, 100 tanker or transport trucks, and 5,000 service dispensers (hoses) that are used to fill the fuel tanks of mobile sources and barbecue and forklift cylinders at the 25 LPG dealers and distributors. The capital and installation costs of a low emission connector for a bobtail truck is estimated to be of $370, and $200, respectively, and that for a tanker or transport truck is estimated to be $2,000 and $200, respectively. The capital and installation cost of a low emission connector for service dispensers is estimated to be $400 and $100, respectively. It is assumed that low emission connectors would be retrofitted by 2013. Assuming a 10-year life for low emission connectors and installation and a real interest rate of four percent, the total average annualized cost of requiring low emission connectors is estimated to be $0.35 million between 2013 and 2025.

Fixed Liquid Level Gauge (FLLG) on LPG Containers

PR 1177 would require 25 LPG dealers/distributors to install FLLGs on LPG storage tanks and cargo tanks. It is assumed that FLLGs will be installed on 39,712 residential tanks, 5,643 commercial tanks, 60,000 forklift cylinders , and 250 bobtail trucks. The capital and installation costs of a FLLG are estimated to be $10 and $50, respectively. It is assumed that the existing 71,000 barbecue cylinders that are filled by volume would be replaced by new cylinders already fitted with the low emission FLLGs since the cost of retrofitting exceeds replacement. The capital and installation costs of these cylinders are estimated to be $30 and $10, respectively.

It is assumed that FLLGs installations and barbecue cylinder replacement will be spread out between 2013 and 2017 at a rate of 20 percent every year. Assuming a 10-year life for FLLGs and barbecue cylinders, and a real interest rate of four percent, the total average annualized cost of FLLGs and new barbecue cylinders is estimated at $0.66 and $0.3 million between 2013 and 2025, respectively.

Gravity Fill Forklift Cylinders

Thirty percent of the LPG forklift cylinder market utilizes the gravity fill method. Field test results indicate that fill times would be significantly higher when cylinders are retrofitted with low emission FLLGs and filled by gravity. As such, it is expected that owner/operators of these forklift cylinders would likely consider one or more of the three possible options: 1) replacing smaller (46 gallons to 125 gallons) stationary storage tanks with forklift cylinders through an exchange program; 2) replacing existing storage tanks ranging from 172 gallons to 288 gallons with a larger (500 gallon) storage tank equipped with a pump and motor to speed up the filling; and 3) adding a pump and motor to existing stationary storage tanks that range in capacity from 499 gallons to 1,150 gallons.

The cylinder exchange program would involve the removal of about 2,038 stationary storage tanks. The average combined capital and installation cost of new forklift cylinders and racks is estimated to be $1,572 and $200, respectively for each tank removed. To facilitate the cylinder exchange program, it is assumed that 25 LPG dealers/distributors would need to purchase six new delivery trucks at a capital cost of $120,000 each. The annual salary of a truck driver is assumed to be $70,000 and the truck maintenance cost is assumed to be $5,000 per year. It is also assumed that the annual cost of hiring six new employees dedicated solely to forklift tank maintenance to be $70,000. The average annual cost of the exchange program including additional employees is estimated to be $1.24 million.

The storage tank replacement option would result in the replacement of approximately 196 stationary storage tanks (currently used for gravity filling forklift cylinders). The replacement capital and installation cost of each tank is estimated to be $1,000, $200, respectively. The capital, installation and engineering design costs associated with the pumps/motors system are estimated to be $3,000, $2,000 and $5,000, respectively. The average annual cost of this option is estimated to be $0.23 million.

The pump/motor retrofit to existing storage tank option would result in the conversion of approximately 415 existing stationary storage tanks (currently used for gravity filling forklift cylinders) to a pressure-fill system by installing one pump/motor on each stationary storage tank. The capital and installation cost of each pump/motor is estimated to be $3,000 and $2000, respectively. The average annual cost of installing one pump/motor on each stationary storage tank is estimated to be $0.22 million.

Based on the staff estimates, there are about 660 gas stations and rental facilities that may choose the option of filling barbecue cylinders as part of their services utilizing an on-site fillby weight option. PR 1177 would require under a fill-by-weight option, that each of these facilities purchase a scale (which may include an automatic shut-off valve) at an estimated cost of $1,000 per unit. The average annual cost of this requirement is estimated to be $0.07 million.

Leak Detection, Recordkeeping, and Reporting Requirements

PR 1177 would require owners/operators of 200 LPG bulk stations & terminals to conduct quarterly physical inspections of all connectors, which is estimated to be $200 per inspection (based on vendors' quotes) with a total annual cost of $0.16 million.

PR 1177 would also require that 200 LPG bulk stations & terminals maintain records of installation, inspections, and repairs of FLLGs and connectors. The annual cost of recordkeeping at each facility is estimated to be $4,800 (based on vendors' quotes) with a total annual cost of $0.96 million.

PR 1177 would require that 200 LPG bulk stations & terminals submit annual reports of monthly LPG purchase and dispensing volumes for calendar years 2013-2015. The total annual cost of reporting for all the affected facilities is estimated to be $0.4 million. The average annual of reporting requirements is estimated to be $0.09 million.

The total average annual cost of inspection (leak detection), recordkeeping, and reporting requirements for the 200 LPG bulk stations & terminals is estimated to be $1.21 million.

JOBS AND OTHER SOCIOECONOMIC IMPACTS

The REMI model (version 1.3.5) is used to assess the total socioeconomic impacts of a policy change. The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino. The REMI model for each county is comprised of a five block structure that includes (1) output and demand, (2) labor and capital, (3) population and labor force, (4) wages, prices and costs, and (5) market shares. These five blocks are interrelated. Within each county, producers are made up of 66 private non-farm industries, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration.

The assessment herein is performed relative to a baseline where there is no adoption of the proposed rule. Direct effects of the policy change (the proposed rule) have to be estimated and used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the actors in the four-county economy on an annual basis and across a user-defined horizon (2013 to 2025). Direct effects of PR 1177 include additional costs to the affected industries and additional sales of materials by local vendors at the county (or finer) level and by industry.

Additional purchases of FLLGs, low emission connectors are expected to benefit the fabricated metal product industry. Expenditures on forklift tanks replacement and conversion of existing forklift tanks to a pressure-fill system are expected to benefit the machinery manufacturing sector. Installation of the above equipment is expected to benefit specialty trade contractors

which are part of construction industry. Spending on pumps/motors equipment is assumed to benefit the machinery manufacturing sector and spending on their associated design is expected to benefit the professional and technical services sector. Purchases of new delivery trucks would benefit the transportation equipment manufacturing sector. Spending on scales would translate into additional sales to the machinery manufacturing sector. Spending on the new deliver truck maintenance is assumed to benefit the sectors of automotive and repair services.

Additional spending on equipment and installation of FLLGs, low emission connectors, replacing forklift tanks through cylinder exchange program, delivery trucks, installation of pumps/motors on stationary storage tanks, and converting existing forklift tanks to a pressure-fill system would result in increase in cost of doing business for LPG dealers/distributors. Additional spending on scales would increase additional cost of doing business for the affected gasoline stations and general rental centers facilities that refill barbecue cylinders.

The additional labor required for driving delivery trucks would result in a reduction in labor productivity for the affected LPG dealers/distributors and the additional labor required for, inspection, reporting, and recordkeeping requirements, and new forklift tank maintenance would result in a reduction in labor productivity for the affected LPG bulk stations & terminals. This is because more labor would now be required to produce the same amount of output.

Job Impacts

Overall, 21 jobs could be forgone annually, on average, between 2013 and 2025, which is about 0.0002 percent of the baseline jobs in the four county area. Table 2 presents the estimated job impact by industry for the proposed rule. In the first three years (2013-2015), there would be additional jobs created. In 2013, 46 additional jobs could be created in the overall economy. Increased in jobs in the sectors of construction, fabricated metal product manufacturing, machinery manufacturing, and professional and technical services are due to additional spending on equipment, devices, and their installations. In earlier years, positive job impacts from the expenditures made by LPG dealers/distributors, LPG bulk stations & terminals, and gasoline stations and general rental centers facilities would more than offset the jobs forgone from the additional cost of doing business.

However, as LPG dealers/distributors, and LPG bulk stations & terminals continue to amortize their capital expenditures throughout the simulation period there would be net jobs forgone in later years. The retail trade sector where the affected LPG dealers/distributers and gas stations belong would experience 14 jobs forgone due to the additional cost of doing business incurred by them. The sectors of wholesale trade (where LPG stations & terminals and general rental centers belong) are projected to have few job impacts. The remaining sectors would incur minor jobs forgone from secondary and induced impacts of the proposed rule.

Table 2
Job Impacts of Proposed Rule

Industries (NAICS)	2013	2015	2025	Average Annual (2013-2025)
Construction (23)	15	10	6	4
Fabricated metal product manufacturing (332)	3	3	2	2
Machinery manufacturing (333)	3	0	0	0
Wholesale trade (42)	7	5	0	2
Retail trade (44-45)	1	-7	-19	-14
Professional and technical services (54)	4	2	-1	0
Administrative and support services (561)	1	0	-2	-1
Ambulatory health care services (621)	2	0	0	0
Food services and drinking places (722)	1	0	-3	-2
Repair and maintenance (811)	0	0	-1	0
Government (92)	3	0	-5	-3
Other Industries	7	0	-10	-7
Total	**46**	**13**	**-33**	**-21**

Competitiveness

The additional cost brought on by the proposed rule would increase the cost of services rendered by the affected industries in the region. The magnitude of the impact depends on the size and diversification of, and infrastructure in a local economy as well as interactions among industries. A large, diversified, and resourceful economy would absorb the impact with relative ease.

Changes in production/service costs will affect prices of goods produced locally. The relative delivered price of a good is based on its production cost and the transportation cost of delivering the good to where it is consumed or used. The average price of a good at the place of use reflects prices of the good produced locally and imported elsewhere.

It is projected that the retail trade sector where the affected LPG dealers/distributers and gas stations belong would experience a rise in its relative cost of services by 0.0029 percent and a rise in its delivered price by 0.0023 percent in 2017 from the implementation of the proposed rule.

RULE ADOPTION RELATIVE TO THE COST-EFFECTIVENESS

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost-effectiveness. The 2007 Air Quality Management Plan (AQMP) ranked, in the order of cost-effectiveness, all of the proposed control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first.

PR 1177 partially implements Control Measure MSC-07—Application of All Feasible Measures—in the 2007 AQMP. The cost-effectiveness of Control Measure MSC-07 was not

assessed for the 2007 AQMP. As such, the ranking order of cost-effectiveness is not applicable here. The overall cost effectiveness of the proposed rule is estimated to be $1,700 per ton of VOC, which is well below the cost-effectiveness of recently adopted VOC rules.

REFERENCES

Dun & Bradstreet Enterprise Database. 2012.

Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Region (70 sector model). Version 1.3.5.

South Coast Air Quality Management District (SCAQMD). Proposed Rule 1177─Liquified Petroleum Gas Transfer and Dispensing. May 2012.

U.S. Small Business Administration (US SBA). Small Business Size Standards. March 2012.

ERRATA SHEET FOR AGENDA ITEM #31

Amend Proposed Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing

Modify Proposed Rule 1177 paragraph (d)(2) to extend the compliance deadline for use of low emission connectors from July 1, 2013 to January 1, 2014 by moving subparagraph (A) to the end of paragraph (d)(2) where it becomes subparagraph (D), which is stated below with the changes in **bold double underlined** language. As a result, previous subparagraphs (B), (C) and (D) become subparagraphs (A), (B) and (C). Subparagraph (D) now reads as follows:

(D) Notwithstanding the above effective date of July 1, 2013, the stationary storage tank, cargo tank or cylinder used to transfer or dispense LPG is fitted exclusively with LPG low emission connectors that are maintained in a vapor tight and liquid tight condition, except when actively connecting or disconnecting**, after December 31, 2013**.

Modify the Staff Report, middle of page 20, as follows:

PVF = Present Value Factor, which is 8.11 for an assumed 10 years equipment life and 4% real rate of ~~**inflation**~~ **interest**.

Add the following paragraph to the Resolution on page 4:

BE IT FURTHER RESOLVED, the AQMD Governing Board directs AQMD staff not to submit subdivision (i) of Rule 1177, which refers to Confidentiality of Information, into the State Implementation Plan, in order to avoid potential conflict with federal law requirements, but to otherwise maintain confidentiality consistent with state and federal law.