



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

# Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK  
Governor

RICHARD K. SULLIVAN JR.  
Secretary

KENNETH L. KIMMELL  
Commissioner

## **BACKGROUND INFORMATION AND TECHNICAL SUPPORT FOR PROPOSED AMENDMENTS TO**

**310 CMR 7.00: Definitions**

**310 CMR 7.24(3): Distribution of Motor Vehicle Fuel**

**310 CMR 7.24(4): Motor Vehicle Fuel Tank Trucks**

**310 CMR 7.24(5): Gasoline Reid Vapor Pressure**

**310 CMR 7.24(6): Dispensing of Motor Vehicle Fuel**

**310 CMR 7.24(9): Dispensing of E85 Motor Vehicle Fuel/Ethanol  
Blends**

Regulatory Authority:  
M.G.L. Chapter 111, §§ 142A through 142O

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### Attachment 1

## I. SUMMARY

The Massachusetts Department of Environmental Protection (MassDEP) proposes to amend 310 CMR 7.24(3), 7.24(4), 7.24(5), 7.24(6), 7.24(9), and specific definitions at 310 CMR 7.00 to require removal of Stage II vapor recovery systems and the addition of enhancements to Stage I vapor recovery requirements at gasoline dispensing facilities (GDFs). Gasoline vapors contribute to the formation of ground-level ozone and also contain toxic chemicals. Stage II systems capture vapors displaced by refueling of motor vehicles, and Stage I systems capture vapors displaced by the filling of underground and above ground gasoline storage tanks. Most vehicles now are equipped with on-board refueling vapor recovery so that Stage II systems are no longer providing additional emission reductions. Stage I system technology has improved to be more effective at capturing vapors. Therefore, MassDEP is proposing to eliminate Stage II requirements and require enhancements to Stage I systems at GDFs<sup>1</sup>.

MassDEP's existing Stage II regulations, 310 CMR 7.24(6): Dispensing of Motor Vehicle Fuel, require GDFs to have Stage II vapor recovery systems.<sup>2</sup> The proposed amendments to 310 CMR 7.24(6) would:

- Eliminate the requirement that GDFs have Stage II systems;
- Require GDFs to properly decommission existing Stage II systems within two years of the effective date of the amendments, with a possible two-year extension for facilities with an annual gasoline throughput of <500,000 gallons; and
- Require that, at the time of decommissioning, GDFs install California Air Resources Board (CARB) Enhanced Vapor Recovery (EVR) pressure/vacuum (P/V) vent valves<sup>3</sup> and CARB EVR rotatable adaptors<sup>4</sup> (except coaxial Stage I systems).

MassDEP's existing Stage I regulations, 310 CMR 7.24(3): Distribution of Motor Vehicle Fuel, require GDFs that have a storage tank with a capacity greater than 250 gallons to have submerged filling and Stage I vapor balance systems that capture vapors emitted during the transfer of gasoline from a tank truck to the storage tank. The proposed amendments to 310 CMR 7.24(3) would require GDFs to phase in the use of CARB EVR Stage I system components (for both underground and above-ground storage tanks). The amendments would require that:

- If not already installed, within 180 days of the effective date of the regulation, GDFs install a CARB EVR P/V vent valve and CARB EVR rotatable adaptors. (The rotatable adaptor requirement would not apply to GDFs with co-axial Stage I systems.)

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<sup>1</sup> MassDEP's regulations refer to Motor Vehicle Fuel Dispensing Facilities but this background document uses gasoline dispensing facilities (GDF) to describe facilities covered by these regulations (the term "GDF" is not contained in MassDEP's regulations).

<sup>2</sup> Stage II requirements were phased in between 1989 and 1994 and cover most GDFs in Massachusetts.

<sup>3</sup> Vent pipes allow venting of vapors from gasoline storage tanks. P/V vent valves installed on the top of vent pipes are designed to minimize vapor loss while maintaining a safe pressure level within the storage tank.

<sup>4</sup> Adaptors are the connection points for the cargo tank truck to the service station underground storage tank. The adaptors tend to become loose during the bulk fuel delivery as the cargo tank driver connects and disconnects the hoses for the fuel transfer. This is one of the commonly identified causes of leaks from vapor recovery systems. CARB EVR regulations include a requirement for 360 degree rotatable vapor and product adaptors to improve tightness.

- Any GDF that installs a fuel storage tank after the effective date of the regulation install a CARB Stage I EVR System or a Stage I system comprised of CARB EVR components.
- If a GDF replaces a Stage I component after the effective date of the regulation, the component must be replaced with a CARB EVR component.
- GDFs with a monthly throughput of 100,000 gallons or more maintain Stage I systems that meet the same management practices required by the U.S. Environmental Protection Agency’s (EPA) GDF area source air toxics rule<sup>5</sup> (which will enable most GDFs to continue to avoid some federal requirements by complying with MassDEP’s regulation).
- GDFs conduct weekly visual inspections and annual in-use compliance tests and file annual certifications of Stage I systems.
- If a GDF fails a compliance test due to a failed component, the component must be replaced with a CARB EVR component.
- Within 7 years of the effective date of the regulation, GDFs have fully installed a CARB Stage I EVR System or a Stage I system that is comprised of CARB EVR components.

MassDEP also is proposing amendments to 310 CMR 7.00: Definitions that relate to Stage I and Stage II to reflect the proposed amendments to 310 CMR 7.24(3) and 7.24(6); proposing minor clarifying amendments to 310 CMR 7.24(4): Motor Vehicle Fuel Tank Trucks; proposing to delete 310 CMR 7.24(5): Gasoline Reid Vapor Pressure, which has been superseded by the federal reformulated gasoline program; and proposing to delete 310 CMR 7.24(9): Dispensing of E85 Motor Vehicle Fuel/Ethanol Blends, which is no longer needed because E85 GDFs would be covered by the proposed Stage I vapor recovery requirements.

## II. BACKGROUND – CONTROL OF MOTOR VEHICLE FUEL VAPORS

### A. Stage I and II Vapor Controls

Volatile organic compounds (VOCs) and hazardous air pollutants are emitted to the ambient air from multiple points during the transfer, delivery and dispensing of motor vehicle fuel (i.e., gasoline). VOCs are a key contributor to the formation of ground-level ozone. Regulations to control VOCs, including those emitted from gasoline distribution and dispensing, are an important element of the Massachusetts State Implementation Plan (SIP) for ozone. Gasoline vapors contain numerous toxic constituents, including benzene, which is a known carcinogen. Stage I and Stage II vapor recovery systems prevent the release of gasoline vapors to the ambient air, thereby protecting public health and the environment.

MassDEP’s existing Stage I regulations, 310 CMR 7.24(3) Distribution of Motor Vehicle Fuel, were adopted in the early 1980s and require basic Stage I systems that control gasoline vapors during the transfer of motor vehicle fuel from a refinery terminal or bulk plant to a tanker truck and from the tanker truck to the gasoline storage tanks at a GDF. Under the Clean Air Act (CAA), Stage I controls are required for all ozone non-attainment areas as a Reasonably Available Control Technology<sup>6</sup> (RACT) measure.

<sup>5</sup> See 40 CFR. 63.11110 *et seq* (National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Gasoline Dispensing Facilities (GDFs), which are found at 40 CFR Part 63, Subpart CCCCCC.

<sup>6</sup> EPA has defined RACT as: “the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility”

MassDEP's existing Stage II regulations, 310 CMR 7.24(6) Dispensing of Motor Vehicle Fuel, were adopted in 1989 and require Stage II systems to control gasoline vapors during the retail dispensing of gasoline to motor vehicles.<sup>7</sup> MassDEP's Stage II regulations require that Stage II systems be certified by the California Air Resources Board (CARB) to achieve 95% vapor control. CARB's Stage II certifications rely on CARB-certified Stage I systems for achieving the 95% control efficiency. Therefore, MassDEP's Stage II requirements have the effect of requiring CARB-certified Stage I systems, which are more stringent than the Stage I vapor balance systems required by MassDEP's existing Stage I regulations in 310 CMR 7.24(3).

The current CARB-certified Stage I systems required by MassDEP are "pre-EVR." MassDEP's proposed amendments require the use of Stage I enhanced vapor recovery (EVR) systems or components. In 2001, CARB promulgated regulations establishing EVR requirements for Stage I<sup>8</sup> systems to further reduce emissions caused by the transfer of gasoline from a tanker truck to a fuel storage tank at a GDF. CARB certifies that Stage I components manufactured and sold by various vendors meet CARB EVR performance specifications. CARB EVR components are better designed and more durable than non-EVR Stage I components. EVR components address common causes of leaks in dispensing systems, such as adaptors (the connection points between the tank truck and the service station storage tank), drop tubes, and drain valves. The CARB EVR pressure/vacuum vent valves are certified to a more stringent leak rate than pre-EVR valves.

CARB also certifies systems comprised of specific Stage I components. There currently are four such CARB EVR Stage I systems that have been certified.<sup>9</sup> CARB Stage I EVR Systems have been tested to ensure that they are 98% efficient at collecting vapors during filling of storage tanks over a range of operating conditions and field testing for a minimum of 6 months at multiple sites. Thus, CARB Stage I EVR systems are certified to improve tank filling vapor capture to 98% from 95% for pre-EVR systems. The CARB EVR components and systems also decrease overall leaks that take place under all operating scenarios (vs. only tank filling) and therefore reduce breathing losses (losses that can occur due to swings in ambient temperature) from underground storage tanks.

## **B. EPA NESHAPS Requirements**

The U.S. Environmental Protection Agency (EPA) has established National Emission Standards for Hazardous Air Pollutants (NESHAP) for Gasoline Dispensing Facilities (GDFs), which are found at 40 CFR Part 63, Subpart CCCCC. The NESHAP establishes national Stage I requirements, but allows a GDF with a monthly throughput of 100,000 gallons or more to be considered in compliance with certain GDF NESHAP requirements if the GDF, prior to January 10, 2008, complies with State requirements that achieve an emissions reduction of at least 90%

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(44 FR 53762; September 17, 1979).

<sup>7</sup> In 2009, MassDEP added 310 CMR 7.24(9) to exempt GDFs that dispense E85, from Stage II requirements because the majority of E85 fuel capable vehicles are equipped with ORVR. These regulations require Stage I vapor controls and compliance requirements and procedures similar to those required by the Stage II regulations.

<sup>8</sup> CARB uses the term "Phase 1" instead of the term "Stage I."

<sup>9</sup> A fifth system by EMCO was de-certified in 2010 but is expected to re-gain CARB certification in the near future.

or require management practices at least as stringent as those in EPA's NESHAP. MassDEP's current Stage II regulations have the effect of requiring CARB-certified Stage I systems, which are certified to achieve at least 90% emissions reductions, so that GDFs that were in compliance with MassDEP's current Stage II regulations prior to January 10, 2008 are deemed in compliance with the GDF NESHAP requirements.

Under MassDEP's proposal, "pre-2008" GDFs that install CARB-certified EVR Stage I systems would continue to meet the NESHAP 90% emissions reduction criterion and would be considered in compliance with the NESHAP. However, "pre-2008" GDFs that install "mix and match" EVR Component systems would not be considered to meet the 90% emissions reduction criterion because these systems are not formally certified to meet a particular emissions reduction, even though MassDEP believes they would more than exceed a 90% emissions reduction. Therefore, MassDEP is proposing to include the NESHAP management practices in its regulation for these GDFs to satisfy the second option in the NESHAP of meeting a state rule that requires management practices at least as stringent as the NESHAP management practices. While "pre-2008" GDFs that install CARB EVR systems would continue to meet the 90% reduction criterion, MassDEP is proposing that these GDFs also meet the proposed management practices for consistency and because CARB EVR systems can easily meet these practices.

GDFs with a monthly throughput of 100,000 gallons or more that do not qualify for the pre-January 10, 2008 NESHAP provision must comply with the NESHAP management practices, so MassDEP also is making the management practices applicable to these GDFs so that MassDEP's regulations are consistent with EPA's NESHAP. These GDFs could then comply with the technical requirements of the NESHAPs by complying with MassDEP's regulations. However, these GDFs would be subject to additional NESHAP requirements (notification, testing and monitoring, record-keeping, etc.) contained in 40 CFR 63 Subpart CCCCC. MassDEP encourages all GDFs to familiarize themselves with EPA's requirements, and notes that authority to administer and enforce this NESHAP has not been delegated to MassDEP and is enforced solely by EPA.

MassDEP seeks comments from stakeholders on whether it is useful for MassDEP to include the NESHAP management practices in its Stage I regulations to facilitate compliance with the NESHAP.

### **C. Clean Air Act Requirements for Stage II**

Section 182(b)(3) of the Clean Air Act (CAA), 42 U.S.C. 7511a(b)(3), requires areas designated as a "moderate" or worse nonattainment areas under the ozone NAAQS to adopt Stage II controls. However, section 202(a)(6) of the CAA, 42 U.S.C. 7521(a)(6), provides EPA with authority to waive the Stage II requirements of section 182(b)(3) when on-board refueling vapor recovery (ORVR) systems are determined to be in widespread use throughout the motor vehicle fleet.

Massachusetts and other states in the Ozone Transport Region (OTR)<sup>10</sup> are subject to a separate requirement in CAA Section 184(b)(2), 42 U.S.C. 7511c(b)(2), that requires Stage II or comparable measures in the OTR irrespective of ozone attainment status. In order to remove Stage II controls, states in the OTR must ensure that there is no significant increase in emissions from removal of Stage II programs.

Massachusetts was an ozone nonattainment area in the 1980s and was classified as a “serious” ozone non-attainment area in the 1990s. Since the 1980s, MassDEP and EPA have adopted many regulatory programs to control emissions of VOCs and nitrogen oxides, which are precursors to ozone formation. Ozone concentrations in Massachusetts and other states have dropped significantly as a result. In April 2012, EPA issued designations for the 2008 ozone NAAQS and designated Massachusetts as an attainment area with the exception of Dukes County (Martha’s Vineyard and other islands), which EPA designated as a marginal nonattainment area. EPA is expected to issue a more stringent ozone standard in 2015, which may require further emission reductions in Massachusetts. Therefore, MassDEP believes it is prudent to require Stage I enhancements at this time to ensure that VOCs and toxic emissions from GDFs remain as low as possible.

#### **D. On-Board Refueling Vapor Recovery (ORVR)**

Under the 1990 amendments to the CAA, EPA promulgated regulations requiring motor vehicle manufacturers to install ORVR systems on light and medium-duty vehicles. ORVR systems are carbon canisters installed on motor vehicles to capture the fuel vapors displaced from the vehicle tank during refueling. The vapors are then burned off during vehicle operation. These vapors are the same vapors captured by Stage II systems installed at GDFs. Under EPA’s regulations, since model year 2000, all passenger cars have been equipped with ORVR systems. Since model year 2006, all light duty trucks, SUVs and medium duty vehicles have been equipped with ORVR systems.

For vehicles that have ORVR, Stage II does not provide additional fuel vapor capture. Therefore, the amount of vapors captured by Stage II systems decreases as cars with ORVR replace older cars in the vehicle fleet. Eventually, the diminishing benefits of Stage II systems no longer justify the cost of installing them in new service stations or maintaining existing systems. One type of Stage II control system – vacuum-assist – is generally incompatible with ORVR. Use of a vacuum-assist system to refuel an ORVR-equipped car can result in greater vapor emissions than if the car was refueled at a pump without a Stage II system.<sup>11</sup> This incompatibility further diminishes the air quality benefits of Stage II systems as ORVR prevalence increases.

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<sup>10</sup> The Ozone Transport Region (OTR) is comprised of eleven states in the northeastern U.S. and the District of Columbia.

<sup>11</sup> Vacuum assist systems draw air into the underground storage tank during fueling of a vehicle with ORVR leading to vapor growth in the tank and fugitive and vent vapor emissions.

In May 2012, EPA issued a rule finding that ORVR-equipped vehicles are in widespread use in the U.S. motor vehicle fleet.<sup>12</sup> EPA used two analytical approaches to determine the date of widespread use:

1. Estimating when ORVR systems alone provide the same benefits as Stage II systems alone. EPA assumes that Stage II systems are 77.4% effective, so widespread use occurs when ORVR systems are projected to reduce refueling emissions by 77.4%.
2. Estimating when 75% of the gasoline is dispensed to ORVR equipped vehicles.

Using the first approach, EPA determined that widespread use occurred in May of 2013. Using the second approach, EPA determined that widespread use occurred in April 2012. Based on the dates derived from these two approaches, EPA determined that ORVR was in widespread use in the national fleet as of May 16, 2012, the date of the final rule. EPA subsequently published guidance that described the analysis a state must perform to remove Stage II requirements from the state's SIP.<sup>13</sup> MassDEP intends to submit the final amendments to 310 CMR 7.00 to EPA for inclusion in the Massachusetts ozone SIP. (See Section III.D. for MassDEP's supporting analysis documenting the impact of removing Stage II pursuant to EPA's guidance.)

### **III. Evaluation of MassDEP's Stage II and Stage I Programs**

EPA's widespread use rule encourages each state to assess whether and how to phase out its Stage II program considering state-specific parameters. Therefore, MassDEP undertook an evaluation of potential removal of its Stage II program.

#### **A. Consultant Analysis**

In April 2012, MassDEP contracted with Eastern Research Group, Inc (ERG) to evaluate the following:

- The emissions benefits and the costs of retaining Stage II in Massachusetts in 2013, 2015, and 2018;
- The emissions benefits and the costs of potential enhancements to Stage I systems; and
- Whether removing Stage II would have disproportionate impacts in Environmental Justice (EJ) areas.

ERG completed the evaluation and published a report entitled *Air Program Support for Stage I and Stage II Programs in Massachusetts Final Report, December 12, 2012* (available at [www.mass.gov/eea/docs/dep/air/community/s2ergf.pdf](http://www.mass.gov/eea/docs/dep/air/community/s2ergf.pdf)), which is summarized below.

#### Stage II

ERG analyzed the VOC and toxic emissions impact and the cost to GDFs of retaining MassDEP's Stage II program in 2013, 2015, and 2018 and concluded the following:

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<sup>12</sup> Final notice signed on May 9, 2012 and published in Federal Register on May 16, 2012: 77 FR 28772.

<sup>13</sup> Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures, August 7, 2012, EPA-457/B-12-001, page 6.

- ORVR systems alone will result in the same reductions as Stage II systems alone by approximately July 2013.
- Stage II in combination with ORVR will continue to reduce refueling emissions until 2015.
- Between July 2015 and July 2016, the continued presence of Stage II systems may cause emissions to increase relative to the ORVR alone case.
- The cost-effectiveness of Stage II systems declines significantly between 2013 and 2015.

### Stage I

ERG estimated the additional reduction of VOC and toxic emissions that could be realized from improvements to MassDEP's Stage I control program. As described in the ERG report, there are three main sources of gasoline vapor emissions at GDFs:

1. Refueling losses when gasoline is pumped into motor vehicles displacing vapors in the vehicle tank; these are captured by Stage II and ORVR systems.
2. Filling losses when gasoline is transferred from tanker trucks to GDF storage tanks displacing vapors in the tank; and
3. Underground storage tank breathing losses that occur due to gasoline evaporation and barometric pressure changes.

MassDEP requires GDFs to have CARB-certified Stage I controls that capture 95% of the filling losses when the system is correctly operating. Breathing losses are reduced but not totally eliminated by pressure/vacuum vent valves (P/V valves), which are part of the Stage I system. The control of filling losses and tank breathing losses depends on the condition of Stage I systems, including P/V valves. ERG gathered data from Massachusetts and other states that indicate that Stage I systems can quickly develop leaks that increase filling and tank breathing losses and cause facilities to fail system performance tests. Stage I system enhancements can reduce filling and tank breathing losses.

ERG examined the costs and benefits of the following potential enhancements to Stage I systems:

- Upgrade to CARB EVR Stage I requirements.
- Installation of Continuous Vapor Leak Monitoring Systems.
- Installation of Tank Pressure Management Systems.

ERG made the following conclusions:

- CARB-certified Stage I EVR systems are estimated to reduce VOC emissions by 3.7 tons per summer day (TPSD) at an average cost of \$2,000 per ton of VOC reduced. Costs per ton of reduction are considerably lower for GDFs with throughput of greater than 500,000 gallons per year (~\$1,000 per ton). The cost per ton would be less if GDFs incrementally upgraded to CARB EVR as components are replaced or when facilities are significantly modified, instead of requiring stations to upgrade all components at one time.

- Continuous vapor leak monitoring systems are estimated to reduce VOC emissions by up to 2.7 TPSD at a cost of \$8,500 per ton of VOC reduced. Exempting GDFs that dispense less than 1,200,000 gallons per year reduces benefits to 2.0 TPSD and would reduce the cost to \$3,800 per ton. MassDEP would have to develop its own parameters for these systems, as the vapor leak monitoring systems in place in California (the only state that requires them) are designed to operate with CARB EVR Stage I and Stage II systems.
- Tank pressure management systems have the potential to significantly reduce VOC emissions at a relatively low cost. However, additional data must be collected from GDFs in Massachusetts to better define the benefits and cost per ton of VOC reduced for tank pressure management systems.

### Environmental Justice

ERG conducted a preliminary assessment of whether removing Stage II controls could result in disproportionate air quality impacts in Environmental Justice (EJ) areas. To do this, ERG analyzed whether EJ communities have a greater proportion of non-ORVR vehicles. The analysis demonstrated that EJ communities have a slightly lower proportion of ORVR vehicles (73%) than non-EJ communities (77%), and GDFs located in EJ areas likely dispense a greater proportion of gasoline to non-ORVR vehicles (28%), as compared to GDFs located in non-EJ areas (26%). Both observations suggest that removal of Stage II controls could have a slight disproportionate impact on EJ areas due to refueling emissions.

However, ERG noted that its analysis did not take into account other factors (e.g., the differences between ORVR and non-ORVR vehicles in terms of vehicle miles traveled and fuel economy) that likely would suggest that the difference in air quality impacts between EJ and non-EJ areas might actually be lower than the summary statistics regarding ORVR vehicles imply (e.g., newer ORVR vehicles likely are driven more and therefore re-fueled more often). Based on the ERG analysis, MassDEP does not believe there will be a significant disproportionate impact on EJ communities from the removal of Stage II, and the proposed improvements to the Stage I program will reduce air quality impacts from GDFs.

### **B. Stakeholder Involvement**

MassDEP held a stakeholder meeting on August 15, 2012 to receive comment on ERG's Draft Report (dated 7/16/12). An Addendum to the ERG Report was issued on 8/22/2012 to address provisions of EPA's August 7, 2012 final *Guidance on Removing Stage II Gasoline Vapor Recovery Programs for State Implementation Plans and Assessing Comparable Measure (EPA's Guidance on Removing Stage II)*.<sup>14</sup> MassDEP accepted comments on the ERG Report, including the Addendum, until October 1, 2012. The ERG Final Report was issued on December 12, 2012 and included a number of revisions to the Draft Report made in response to stakeholder comments.

On January 10, 2013, MassDEP held a stakeholder meeting to discuss its initial recommendations for Stage I and II program changes. Based on the ERG Report findings and on

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<sup>14</sup> EPA's Guidance is available at: [www.epa.gov/glo/pdfs/20120807guidance.pdf](http://www.epa.gov/glo/pdfs/20120807guidance.pdf).

comments received from stakeholders during and following the August stakeholder meeting<sup>15</sup> MassDEP recommended that:

- Stage II be terminated in 2013 pursuant to regulations to be promulgated by July 2013;
- CARB Stage I EVR systems be required for new GDFs and modified GDFs;
- GDFs with an annual throughput of 500,000 gallons or more install CARB Stage I EVR Systems by 2017; and
- Vapor monitoring systems be required for GDFs with an annual throughput greater than 1.2 million gallons. At the stakeholder meeting, MassDEP noted that it was reconsidering this recommendation in light of:
  - lack of certified monitoring systems for Stage I-only GDFs;
  - comments received regarding limited vapor growth in GDFs that do not dispense fuel overnight; and
  - a need for additional study and research on the benefits and costs of monitoring.

On March 27, 2013, MassDEP held a stakeholder meeting to review preliminary draft regulatory language for the Stage I and II program revisions that were introduced at the January 10, 2013 stakeholder meeting. MassDEP accepted comments on the preliminary draft language until April 19, 2013. Based on these comments and further discussion with stakeholders, MassDEP prepared these proposed amendments.

During the March stakeholder meeting, MassDEP also discussed its preliminary evaluation of drip-less gasoline dispensing nozzles and low-permeability gasoline dispensing hoses. Recent advances in this equipment show potentially significant benefits in terms of reducing emissions of VOCs and air toxics. Therefore, the agency will continue to track the development of these new technologies and may consider amendments to these regulations in the future to require upgrades in hoses and nozzles to reduce exposure to gasoline.

### **C. Enforcement Directives**

On July 2, 2012, MassDEP issued an Enforcement Discretion Directive (the July 2012 Directive – [www.mass.gov/eea/docs/dep/air/laws/s2ltr12.pdf](http://www.mass.gov/eea/docs/dep/air/laws/s2ltr12.pdf)) that allowed new and modified GDFs to be constructed without installing Stage II systems if, after July 9, 2012, the GDF either began dispensing fuel for the first time or excavated to repair or replace a Stage II system or underground storage tank. (Note that Stage I systems are still required.) At that time, MassDEP was assessing when to phase out its Stage II program. Because Stage II systems are costly to install, MassDEP did not think it was reasonable to require new or modified facilities to incur the expense of installing or repairing Stage II systems knowing that the systems might no longer be required in the near future. Therefore, MassDEP exercised enforcement discretion to allow new or substantially modified facilities to operate without Stage II systems as of July 9, 2012.

On June 21, 2013, MassDEP issued an Enforcement Discretion Directive (the June 2013 Directive – [www.mass.gov/eea/docs/dep/air/community/s2edd13.pdf](http://www.mass.gov/eea/docs/dep/air/community/s2edd13.pdf)) allowing all GDFs to

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<sup>15</sup> The recommendations were emailed to stakeholders on January 2, 2013 and posted at: [www.mass.gov/eea/docs/dep/air/community/327over.pdf](http://www.mass.gov/eea/docs/dep/air/community/327over.pdf).

decommission their Stage II systems as of July 1, 2013 (Stage I systems are still required and must be maintained; EPA's GDF NESHAP also requires Stage I systems). Once again, MassDEP did not think it was reasonable to require GDFs to incur the expense of maintaining, repairing and operating Stage II systems that MassDEP would be proposing to require be decommissioned in the near future.

#### **D. State Implementation Plan Revision**

MassDEP is required to submit the final regulatory amendments to EPA as a revision to the State Implementation Plan (SIP). In order for EPA to approve the regulatory amendments, MassDEP must demonstrate that the amendments meet CAA Section 184(b)(2) and Section 110(l). Section 184(b)(2) requires states in the Ozone Transport Region to implement Stage II or "comparable measures." Section 110(l) prohibits EPA approval of a SIP revision that interferes with attainment of the NAAQS or other CAA applicable requirements.

##### CAA Section 184(b)(2) - Comparable Measures

EPA published guidance that describes the analysis a state must perform to remove Stage II requirements from the state's SIP.<sup>16</sup> MassDEP has conducted an analysis using the methodology in the EPA guidance, which provides equations and regional data that may be used by states to estimate the VOC emissions impact of phasing out Stage II programs. In its guidance EPA states that "in the specific context of the comparable measures requirement, it is reasonable to conclude that the incremental emissions control that Stage II achieves beyond ORVR is *de minimis* if it is less than 10% of the area-wide emissions inventory associated with refueling highway motor vehicles."<sup>17</sup>

Equation 1 in EPA's guidance demonstrates the overall increment, or the annual area-wide emissions control gain, from Stage II installations at GDFs as ORVR technology phases in. Thus, it also indicates the emissions reduction potential loss from removing Stage II. Using both Massachusetts-specific and EPA default factors, MassDEP calculated that the emissions reduction potential loss from removing Stage II in 2013 is 5.12%, which meets EPA's *de minimis* criterion of less than 10% of the highway vehicle refueling emissions. Using Equation 3 in EPA's guidance, MassDEP calculated that this potential emissions reduction loss equates to 1.20 tons per summer day in 2013. These calculations are provided in Attachment 1 and demonstrate that Massachusetts meets the CAA Section 184(b)(2) comparable measures requirement using EPA's *de minimis* criterion.

##### CAA Section 110(l) - Interference with Attainment – Stage II Revisions

In evaluating a proposed SIP revision, as required by CAA Section 110(l), EPA determines if the revision would interfere with applicable CAA requirements, including interference with attainment or maintenance of the NAAQS. EPA notes in its Stage II guidance that it generally considers whether the proposed SIP revision will allow for an increase in actual emissions over

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<sup>16</sup> Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures, August 7, 2012, EPA-457/B-12-001.

<sup>17</sup> Ibid, page 6.

what is allowed under the existing EPA-approved SIP. An increase in emissions may be considered to be “backsliding,” which is prohibited under Section 110(l).

As noted above in Section III.A., ERG’s analysis<sup>18</sup> of the removal of MassDEP’s Stage II program concluded that:

- ORVR systems alone will result in the same reductions as Stage II systems alone by approximately July 2013.
- Stage II in combination with ORVR will continue to reduce refueling emissions until 2015. ERG estimated Stage II reductions of 1.73 – 1.98 TPSD in 2013 declining to 0.36 – 0.52 TPSD in 2015. (ERG used Stage II effectiveness estimates of both 70% and 75%, which results in the range of estimated reductions.)
- Between July 2015 and July 2016, the continued presence of Stage II systems may cause emissions to increase relative to the ORVR alone case.

EPA’s guidance states that a small temporary increase in VOC emissions can meet the Section 110(l) requirement: “A phase-out plan that would result in very small foregone emissions reductions in the near term that continue to diminish rapidly over time as ORVR phase-in continues, may result in temporary increases that are too small to interfere with attainment or progress toward attainment. This may be particularly evident in areas that are already attaining the ozone NAAQS or where emissions and/or air quality projections already demonstrate that an area is likely to maintain the NAAQS into the future.”<sup>19</sup>

In accordance with EPA’s guidance, MassDEP is able to demonstrate that removal of Stage II vapor controls meets the requirements of Section 110(l) because although the removal may result in a small increase in emissions in the near term, the increase diminishes rapidly and will not interfere with attainment or progress toward attainment. ERG estimated that the maximum reductions from retaining Stage II in 2013 were 1.73 – 1.98 TPSD. As discussed above, using Equation 3 in EPA’s guidance, MassDEP calculated the potential emissions reduction loss from removing Stage II to be 1.20 TPSD in 2013.<sup>20</sup> ERG did not estimate emissions from Stage II in 2014, but the 2015 estimates demonstrate the rapid reduction of emissions benefits from Stage II between 2013 and 2015. By 2014 the reductions that Stage II would have achieved would be significantly less than in 2013 and by 2015 the reductions would be reduced to 0.36 – 0.52 TPSD.

These estimates show that MassDEP’s proposal is consistent with EPA’s guidance because the proposed amendments result in only a small loss in emissions reductions in 2013 (considerably less than the ERG estimate of 1.73 – 1.98 TPSD or the MassDEP estimate of 1.20 TPSD because Stage II remains largely in place), with the emission reductions diminishing rapidly in 2014 – 2015 as OVRV continues to phase-in. As noted in Section II.C., Massachusetts currently meets the 1997 ozone NAAQS statewide, and Massachusetts attains the 2008 ozone NAAQS statewide

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<sup>18</sup> Air Program Support for Stage I and Stage II Programs in Massachusetts Final Report, December 12, 2012 [www.mass.gov/eea/docs/dep/air/community/s2ergf.pdf](http://www.mass.gov/eea/docs/dep/air/community/s2ergf.pdf) (ERG Final Report)

<sup>19</sup> Guidance on Removing Stage II Gasoline Vapor Control Programs, August 7, 2012, page 5.

<sup>20</sup> It should be noted that most GDFs in Massachusetts continued to operate their Stage II systems as of late September 2013, so a significant percentage of the reductions from Stage II were realized in Massachusetts during the 2013 ozone season.

except for Dukes county. The small emissions increase that will occur in the short term will not interfere with Massachusetts' existing attainment status or with progress towards achieving attainment in Duke's County, which is comprised of rural islands where non-attainment is attributable to pollution transported from other states. Thus, MassDEP's proposed elimination of the Stage II program meets the requirements of Section 110(l).

#### CAA Section 110(l) - Interference with Attainment – Stage I Revisions

Because MassDEP is proposing changes to its Stage I program, it must demonstrate that these changes do not constitute backsliding. As discussed below, the proposed enhanced Stage I system requirements will result in additional Stage I controls, and therefore will not constitute backsliding from MassDEP's current Stage I requirements.<sup>21</sup>

MassDEP's existing Stage II regulations require that Stage II systems be certified by CARB to achieve 95% vapor control. CARB's Stage II certifications rely on CARB Stage I systems for achieving the 95% control efficiency. Therefore, MassDEP's Stage II requirements (in 310 CMR 7.24(6)) have the effect of requiring CARB pre-EVR certified Stage I systems, used in combination with Stage II systems, to achieve the 95% control efficiency. MassDEP's existing Stage I regulations (310 CMR 7.24(3)), in the absence of Stage II requirements, require only that GDFs have Stage I vapor balance systems with submerged filling, which are not certified to achieve 95% control efficiency.

As discussed above in Section III, ERG estimated that requiring 98% efficient CARB EVR Stage I systems in Massachusetts would reduce VOC emissions by up to 3.7 tons per summer day. MassDEP is proposing to require the installation of either CARB EVR Stage I systems, or EVR Component systems. While CARB EVR Stage I Systems have been certified to operate at 98% vapor recovery, the EVR Component systems have not. Therefore, MassDEP is not assuming a specific level of control efficiency for Component systems. Nonetheless, the proposed Stage I requirements will improve vapor capture as compared to the current Stage I systems required by MassDEP's existing regulations for the following reasons:

1. Within 180 days of the effective date of the regulations, all GDFs will be required to install CARB EVR P/V vent valves, which are certified to a more stringent leak rate than pre-EVR valves.
2. Within 180 days of the effective date of the regulations, GDFs will be required to install CARB EVR rotatable adaptors. Under MassDEP's existing regulations, only GDFs with vacuum assist systems must have CARB rotatable adaptors and there is no requirement to test the adaptors. Under the proposed amendments, the requirement to install EVR adaptors will extend to all facilities (except for aboveground storage tanks and GDFs with coaxial Stage I systems). The CARB EVR design standards for adaptors result in reduced vapor leaks and improve adaptor durability. Furthermore, GDFs will be required to perform the CARB torque test for rotatable adaptors when they are installed and during annual

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<sup>21</sup> The Stage I changes also provide further evidence that the Stage II revisions meet Section 110(l) because the increased reductions from enhanced Stage I systems will partially offset the small amount of short-term emissions increases that may result from eliminating Stage II.

compliance testing<sup>22</sup>. These proposed changes - requiring additional facilities to install CARB EVR rotatable adaptors and requiring torque testing - are clear improvements to MassDEP's current Stage I controls.

3. Within 7 years, all GDFs must have either a CARB EVR system or an EVR Component system. Additionally, during the 7-year period, whenever a facility replaces an existing Stage I component or fails an annual compliance test due to a faulty pre-EVR component, a comparable EVR component must be installed. CARB EVR components meet more stringent performance standards than pre-EVR components. Compared to non-EVR components, they are engineered for increased durability and address common causes of leaks in dispensing systems, such as adaptors (the connection points between the tank truck and the service station storage tank), drop tubes, and drain valves.<sup>23</sup> Components are individually certified to meet engineering and performance standards prior to their in-use certification as part of a CARB EVR Stage I system<sup>24</sup>. Thus, the design and durability of EVR components will result in tighter Stage I controls, whether or not the EVR components comprise a specific CARB Stage I EVR system. In addition to installation of P/V vent valves and rotatable adaptors within 180 days, the following improved EVR components will be required over the 7-year phase in period:

- **Drop tube with Overfill Protection Specification:** CARB EVR requires overfill protection devices on drop tubes. These devices, which are not currently required by MassDEP, use a valve to shut off liquid flow when the underground storage tank is being filled.
- **Spill Containment Boxes:** GDFs in Massachusetts currently must have spill containment boxes but they are not required to meet the EVR standards for product containment boxes, which limit the leak rate to < 0.17 cubic feet/hour at + 2.0 inches H<sub>2</sub>O and prohibit any standing fuel in the containment box of product connectors.
- **Connectors and Fittings:** Loose connectors and fittings can lead to leaks in the underground storage tank. CARB EVR connectors and fittings are designed to meet tighter specifications than pre-EVR equipment.

4. The proposed Stage I revisions will expand the universe of GDFs required to have CARB Stage I systems or components. MassDEP's existing Stage II regulations, which indirectly require CARB Stage I systems, apply to all GDFs with a greater than 250 gallon tank except those constructed before November 1, 1989 that have never dispensed more than 10,000 gallons in any calendar month and have never been substantially modified. The proposed Stage I amendments apply to all GDFs with a greater than 250 gallon tank, and therefore will

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<sup>22</sup> The Static Torque Rotatable Adaptor Test (CARB TP 201.1B) will ensure that the adaptor rotates 360 degrees and the average static torque is no greater than the maximum allowed value.

<sup>23</sup> CARB Staff Report, February 4, 2000: *Initial Statement of Reasons for Proposed Amendments to the Vapor Recovery Certification and Test Procedures for Gasoline Loading and Motor Vehicle Gasoline Refueling at Service Stations*.

<sup>24</sup> As noted previously in Section II.A, CARB EVR Systems have been tested to ensure that they are 98% efficient at collecting vapors during filling of storage tanks in field tests over a range of operating conditions at multiple sites for a minimum of 6 months.

apply to those GDFs that currently are exempt from the requirement to have a CARB Stage I system. MassDEP estimates that less than 1% of the gasoline throughput in Massachusetts currently falls under the existing exemption. Nevertheless, the slight expansion of the universe of CARB Stage I-covered GDFs will result in additional emission reductions and therefore represents an improvement to the existing Stage I program.

5. The CARB EVR Stage I systems and EVR Component systems decrease overall leaks that take place under all operating scenarios (vs. only during tank filling). As discussed in Section III.A and in the ERG Report, other than vehicle refueling emissions, which are captured by Stage II and ORVR systems, there are two main sources of emissions at GDFs – filling losses and breathing losses. The 98% vapor capture efficiency that has been certified by CARB of EVR systems applies only to the control of vapors captured during the filling of storage tanks. Breathing losses occur daily and are attributable to gasoline evaporation and barometric pressure changes. (Breathing losses are reduced but not totally eliminated by P/V valves.) In addition to decreasing filling losses during fuel deliveries, EVR components improve the integrity of the Stage I system and the ongoing containment of storage tank vapors, thereby reducing the incidence of breathing losses.<sup>25</sup>

6. Under the proposed amendments, MassDEP adopts all terms and conditions of the CARB Executive Orders for Stage I EVR systems. These include references to manufacturer operation and maintenance manuals that describe operation, maintenance, and training requirements. GDFs with CARB EVR systems must be operated and maintained according to the requirements of their respective CARB Executive Orders, and GDFs with Component EVR systems must be operated and maintained according to equipment manufacturers' specifications. This creates an enforceable requirement for GDFs to install only EVR components systems that can be effectively operated and maintained with other EVR components. The level of effectiveness need not be 98% efficient, but all GDFs must be able to pass the applicable tests (see below) for system tightness after they decommission their Stage II systems and annually thereafter.

7. The proposed amendments require additional testing of Stage I systems. In addition to the new requirement for torque testing of rotatable adaptors, the proposed amendments also require a newer Pressure Decay Test that is now the industry-standard (2-inches of water pressure instead of 10 inches), and require testing of drop tube/over-fill prevention devices.

8. As discussed in Section IV. B, MassDEP is proposing to adopt into the Stage I requirements in 310 CMR 7.24(3), the regulatory requirements for inspections, record keeping, compliance testing, annual certification and notification currently in its Stage II regulations. Incorporating these provisions in the revised Stage I regulations will insure that GDFs operate and maintain Stage I systems effectively, as has been required for Stage II systems.

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<sup>25</sup> ERG Final Report, Section 4.2.1

## IV. Description of the Proposed Amendments

### A. Proposed Stage II Amendments - 310 CMR 7.24(6)

#### Termination of Stage II Program and Decommissioning

MassDEP's proposed amendments to 310 CMR 7.24(6) prohibit the installation of new Stage II systems and require all GDFs to decommission their existing Stage II systems within two years of the effective date of the amended regulations. MassDEP believes it is important to establish a date by which facilities must decommission Stage II systems because if they are retained after 2015 refueling emissions will increase due to the incompatibility between vacuum-assist Stage II systems and ORVR-equipped vehicles. In addition, it would not be a good use of MassDEP resources to maintain the Stage II program for a decreasing number of stations.

In response to industry comments concerning the expense of decommissioning smaller GDFs, the proposed amendments would allow MassDEP to grant up to a two-year extension of the decommissioning deadline if a GDF with annual throughput of less than 500,000 gallons cannot meet the deadline due to financial hardship or extenuating circumstances.

The proposed amendments require a GDF to maintain its Stage II System in accordance with existing Stage II regulatory requirements until it is properly decommissioned. Decommissioning must be in accordance with the *Petroleum Equipment Institute Recommended Practices for Installation and Testing of Vapor Recovery Systems at Vehicle-Fueling Sites, PEI/RP300-09, Section 14, Decommissioning Stage II Vapor Recovery Piping*. Please see MassDEP's website for more information on decommissioning at [www.mass.gov/eea/agencies/massdep/air/programs/stage-ii-vapor-recovery.html#2](http://www.mass.gov/eea/agencies/massdep/air/programs/stage-ii-vapor-recovery.html#2).

#### Installation of CARB EVR P/V Valves and Rotatable Adaptors

As described in Section (B) below, MassDEP is proposing that GDFs phase in CARB EVR Stage I components over time. Two Stage I components that provide significant emission reductions are P/V valves and rotatable product and vapor adaptors. Therefore, MassDEP is proposing that these Stage I components be upgraded to CARB EVR equipment when a GDF decommissions its Stage II system. The requirement for rotatable adaptors would not apply to coaxial Stage I systems.

MassDEP currently requires all GDFs with Stage II systems to have P/V valves. These existing valves can easily be replaced with CARB EVR P/V valves when a facility decommissions since they can be installed without excavation. MassDEP currently requires all GDFs with a vacuum-assist Stage II system to have rotatable vapor adaptors. Many GDFs have chosen to install CARB EVR adaptors, and those that have not would need to upgrade to CARB EVR adaptors. Rotatable adaptors would be a new requirement for GDFs with vapor balance Stage II systems, which tend to be in use at older, lower throughput facilities.<sup>26</sup>

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<sup>26</sup> ERG estimated that less than 20% of the gasoline dispensed in Massachusetts is at GDFs with balance systems.

## Testing

Prior to commencing operations following Stage II decommissioning and the addition of CARB EVR P/V valves and rotatable adaptors, the proposed amendments require a GDF to perform the following compliance tests to insure that the Stage I system is operating properly:

- Pressure Decay 2 inch Test, CARB test procedure TP-201.3;
- Vapor Tie Test, pursuant to San Diego Air Pollution Control District test procedure TP-96-1, section 5.1.9;
- Pressure/Vacuum Vent Valve Test, TP-201.1E;
- Static Torque Rotatable Adaptor Test, TP-201.1B; and
- If applicable, either Leak Rate of Drop Tube/Drain Valve Assembly Test, TP-201.1 C or Leak Rate of Drop Tube/ Overfill Prevention Devices, TP-201.1D.

When and if a facility fails any of these required tests, the failed Stage I component must be replaced with a CARB EVR component.

### **B. Proposed Stage I Revisions – 310 CMR 7.24(3)**

#### Stage I Enhanced Vapor Recovery (EVR)

MassDEP's proposed amendments to 310 CMR 7.24(3) require Stage I enhanced vapor recovery (EVR) and apply the requirements to a wider group of facilities. Currently, the existing Stage I regulations require all motor vehicle fuel storage tanks greater than 250 gallons to be equipped with vapor balance (Stage I) systems with submerged filling. MassDEP's existing Stage II regulations have the effect of requiring CARB-certified Stage I systems at GDFs subject to the Stage II regulations.

The proposed amendments would require Stage I EVR at all GDFs with storage tanks over 250 gallons, regardless of monthly throughput. The proposed amendments allow GDFs to choose to install either a CARB-certified EVR system (selected from one of four that CARB has certified) or an EVR system made up of components selected from any of the CARB-certified systems (i.e., a "mix and match" approach). New or reconstructed GDFs are required to install an EVR system before commencing operations, while existing facilities have up to 7 years to upgrade to an EVR system.

The proposed amendments allow existing GDFs to phase in EVR components, so that by seven years from the effective date of the amended regulations all GDFs will have either a CARB EVR system or a component EVR system. As part of the phase in, any GDF that replaces a Stage I component must replace it with an EVR component. In addition, if not already installed, within 180 days of the effective date of the amended regulations, all GDFs must install an EVR pressure/vacuum vent valve and EVR rotatable product and vapor adaptors. Rotatable adaptors are not required for coaxial Stage I systems; however, GDFs equipped with coaxial Stage I systems must replace coaxial Stage I systems with two-point Stage I systems within the seven year timeframe.

The proposed amendments establish installation requirements for all Stage I systems to reduce vapor growth and vapor leaks. This includes updated design and installation standards for submerged fill pipes to mirror federal NESHAP<sup>27</sup> requirements (e.g., setting a maximum 6 inch distance from discharge point to bottom of tank). Upon installation or substantial modification, all GDFs must ensure that multiple tanks are properly manifolded to ensure vapor balance and any newly-installed tanks must be equipped with dual-point Stage I systems (co-axial systems are prohibited).

### Stage I Operation, Maintenance and Record Keeping

Operation, maintenance and record keeping requirements for Stage I systems are nearly identical or similar to the current Stage II requirements.

*Operation and Maintenance.* Most of the proposed operation, maintenance and record keeping requirements for Stage I systems are either identical to or similar to current Stage II requirements. Through the proposed amendments, MassDEP adopts all terms and conditions of the CARB Executive Orders for Stage I EVR. These include manufacturer operation and maintenance manuals that describe operation, maintenance, and training requirements. GDFs with CARB EVR systems must be operated and maintained according to the requirements of their respective CARB Executive Orders, and GDFs with Component EVR systems must be operated and maintained according to equipment manufacturers' specifications.

*Inspections and Record Keeping.* Current Stage II regulations require weekly visual inspections to ensure that the system and its components are unbroken, correctly installed and functioning. The proposed amendments for Stage I systems require weekly visual inspections as well as a visual inspection within 24 hours after a fuel delivery. Proposed record keeping requirements are similar to current Stage II requirements. Inspection checklists and compliance test results for the prior twelve-month rolling period must be kept on site. All records must be made immediately available to MassDEP or EPA upon request, and if not immediately available, all records must be delivered to MassDEP or EPA within 24 hours of the initial request.

*Compliance Testing, Certification and Notification.* The proposed amendments for Stage I systems establish annual compliance testing, certification and notification procedures that are nearly identical to current Stage II requirements. One difference regarding compliance testing is that the proposed amendments require a newer Pressure Decay Test that is now the industry-standard (2-inches of water pressure instead of 10 inches), and require tests for rotatable adaptors and drop tube/over-fill prevention devices for GDFs with CARB EVR systems. The proposed amendments also include notification requirements for persons seeking to permanently or temporarily take a Stage I system out of service.

### **C. Proposed Definitions Amendments – 310 CMR 7.00**

MassDEP has proposed amendments to Stage I and Stage II-related definitions in 310 CMR 7.00 to account for the overall proposed amendments. This includes new definitions for the various

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<sup>27</sup> 40 CFR 63, Subpart CCCCC: National Emission Standards for Hazardous Air Pollutants pertaining to Gasoline Dispensing Facilities.

types of Stage I systems (i.e., CARB EVR, Component EVR, and non-enhanced systems), and definitions for Stage I system routine maintenance, minor modification, and substantial modifications.

#### **D. Proposed Tank Trucks Amendments – 310 CMR 7.24(4)**

MassDEP has proposed amendments to 310 CMR 7.24(4): Motor Vehicle Fuel Tank Trucks that make minor changes, including adding language that previously was in 310 CMR 7.24(3) regarding tank trucks and needed to be included in the new section.

#### **E. Proposed Reid Vapor Pressure Deletion – 310 CMR 7.24(5)**

MassDEP has proposed amendments to delete 310 CMR 7.24(5): Gasoline Reid Vapor Pressure because in the early 1990's Massachusetts opted into EPA's more stringent reformulated gasoline (RFG) standards statewide, making the Reid Vapor Pressure regulations obsolete. Section 211 of the Clean Air Act established the RFG program, mandating RFG in certain urban cities and other areas in severe nonattainment of the ozone standard. Section 211 allows states with ozone nonattainment areas to opt-in to the RFG program. As part of a regional ozone attainment strategy, Massachusetts requested to opt-in, which EPA granted in 1995. RFG has been an integral part of the Massachusetts SIP for ozone. It is also part of the state's carbon monoxide attainment and maintenance plan, and provides significant air toxic reduction benefits that have resulted in measured decreases in ambient benzene levels.

#### **F. Proposed E85 Dispensing Deletion – 310 CMR 7.24(9)**

MassDEP has proposed amendments to delete 310 CMR 7.24(9): Dispensing of E85 Motor Vehicle Fuel/Ethanol Blends. In 2009, MassDEP added 310 CMR 7.24(9) to exempt GDFs that dispense E85 (a blend of gasoline and ethanol) from Stage II requirements, because the majority of E85 fuel capable vehicles are equipped with ORVR. These regulations require Stage I vapor controls and compliance requirements and procedures similar to those required by the Stage II regulations. Because E85 vapor controls were not certified by CARB when the regulations were adopted, the regulations require that Stage I vapor control equipment be listed with Underwriter's Laboratory as being compatible with E85 fuel, which is more corrosive than gasoline. Since that time, two Stage I equipment manufacturers – OPW and Phil-Tite – have successfully added E85-compatible components to their CARB EVR Phase I System Executive Orders. Therefore, E85 GDFs will be able to comply with MassDEP's proposed Stage I regulations that require that CARB EVR systems or components be phased in over time because E85 components are included in two CARB Executive Orders.

## IV. IMPACTS OF PROPOSED AMENDMENTS

### A. Economic Impacts

#### Termination of Stage II Program

*New GDFs* - The proposed amendments eliminate the requirement for Stage II systems, so that new and reconstructed GDFs will avoid the costs of installing, operating, testing, and repairing/maintaining Stage II systems, which can range from \$18,000 to \$30,000 or more for installation (depending on GDF size) plus yearly operating costs from \$1,000 to \$4,000.<sup>28</sup>

*Existing GDFs* - Existing GDFs must decommission their Stage II systems within 2 years. MassDEP estimates the cost of decommissioning to be approximately \$3,500 per facility.<sup>29</sup> Once existing GDFs decommission their Stage II systems, they will avoid the annual cost (\$1,000 - \$4,000) of operating, testing and repairing/maintaining Stage II systems.

#### Enhancements to Stage I Systems

*New GDFs*. The proposed amendments require enhanced vapor recovery systems, and allow the GDF to choose either a CARB EVR system or an EVR system comprised of CARB EVR components (i.e., a “mix and match” approach). Total equipment costs for a Stage I system vary according to the number of fuel storage tanks. For a new GDF (usually built with two fuel storage tanks<sup>30</sup>), the average total equipment cost for an EVR Stage I system is \$5,150, compared to \$3,025 for a conventional system, resulting in an incremental cost of \$2,125.

Compared to Stage II equipment (such as gasoline hoses and dispensing nozzles), Stage I equipment tends to require less frequent repair and replacement. Most Stage I equipment is installed underground and, according to manufacturers and GDF owners/operators, should remain in service for many years if installed and maintained properly. According to a MassDEP survey of manufacturers, compared to other Stage I equipment, spill buckets may need to be replaced more frequently<sup>31</sup> on the order of every three to ten years. Using 2013 list pricing, EVR spill buckets cost an average of 15% to 22% more than conventional spill buckets.<sup>32</sup>

The proposed amendments require annual Stage I compliance testing in place of annual Stage II compliance testing. MassDEP estimates that annual Stage I testing costs would be approximately \$1,050, which is \$125 less than estimated current Stage II testing costs of approximately \$1,175.

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<sup>28</sup>Stage II Fact Sheet published by New Hampshire Department of Environmental Services, <http://des.nh.gov/organization/commissioner/pip/factsheets/rem/documents/rem-25.pdf>. EPA estimates that for an average size GDF the annual cost to maintain existing Stage II systems is about \$3,000 per year.

<sup>29</sup> Estimate provided to MassDEP by one contractor.

<sup>30</sup> Most new GDFs are built with two fuel storage tanks, compared to older GDFs that operate with three tanks.

<sup>31</sup> Usually due to damage by snowplows.

<sup>32</sup> Fuel spill buckets: conventional at \$420 each vs. EVR at \$500 each. Vapor spill buckets: conventional at \$420 each vs. EVR at \$540 each.

*Existing Facilities* - The proposed amendments require existing GDFs to phase in Stage I EVR components so that within 7 years they have either a CARB EVR system or a Component EVR system. Therefore, existing GDFs will incur similar incremental EVR equipment costs as new GDFs, but over a seven year period.

Within the first 6 months, existing GDFs must upgrade to EVR P/V vent valves and rotatable fuel and vapor adaptors if they do not already have them. EVR P/V valves cost approximately \$300 each compared to \$120 for a conventional valve. Since most GDFs need only one valve, a GDF will incur a cost of \$300, or an incremental cost of \$180. Most GDFs already have EVR rotatable adaptors. Those that do not can expect to pay approximately \$550 per tank for EVR adaptors compared to approximately \$150 per tank for conventional non-swivel adaptors, or an incremental cost of \$400 per tank. GDFs typically have one to three tanks, so total costs range from \$550 (one tank) to \$1,650 (three tanks), or incremental costs of \$400 to \$1,200.

Similar to new GDFs, existing GDFs will incur annual Stage I testing costs of approximately \$1,050, which is \$125 less than Stage II testing costs of approximately \$1,175.

## **B. Impacts on Massachusetts Municipalities**

There are over 200 municipalities that operate GDFs. These municipalities will have to comply with the proposed amendments, and the savings (Stage II) and costs (Stage I) for compliance will be the same as those incurred by the private sector GDFs. MassDEP notes that ownership and operation of a GDF, which municipalities may voluntarily undertake, is not a mandated municipal service. Therefore, costs associated with GDF operation are not mandated costs subject to the restrictions of Proposition 2 and a half, M.G.L. c. 29 s. 27 C(a) (which requires the state to reimburse municipalities for costs incurred as a consequence of new state laws and regulations if they were associated with a mandated municipal service).<sup>33</sup>

## **C. Agricultural Impacts**

MassDEP's current Stage II regulations exempt GDFs used for farming where the storage tank is less than 550 gallons and has submerged fill pipes. The proposed amendments for enhanced Stage I requirements maintain this agricultural exemption. If a GDF used for farming does not meet this exemption, the owner or operator will have to comply with the proposed amendments and the costs for compliance will be the same as costs incurred by the private sector GDFs.

## **D. Impacts on Other Programs – Air Toxics**

Air toxics are a group of chemical air contaminants that are associated with significant environmental impacts or adverse health effects such as cancer, reproductive effects and birth defects. The Clean Air Act requires EPA to promulgate source-specific controls to address air toxics. EPA has promulgated an area source National Emissions Standard for Hazardous Air Pollutants (NESHAP) for Gasoline Dispensing Facilities at 40 CFR 63, Subpart CCCCC. MassDEP's proposed technical requirements are as stringent as EPA's GDF NESHAP, and the

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<sup>33</sup> See Town of Norfolk v. Department of Environmental Quality Engineering, 407 Mass 233 (1990)

proposed amendments will further reduce air toxics emissions at GDFs by requiring Stage I EVR systems or Component EVR systems at GDFs.

#### **E. Massachusetts Environmental Policy Act (MEPA)**

Pursuant to 301 CMR 11.00 (Massachusetts Environmental Policy Act Regulations), MassDEP is not required to file an Environmental Notification Form (ENF) regarding the proposed amendments. The amendments will not lessen the stringency of existing regulations, the purpose of which is to protect public health and the environment. While the amendments will eliminate the requirement for Stage II systems, when combined with the amendments to Stage I requirements, the proposal is not expected to result in an emissions increase. ORVR and Stage II systems capture the same refueling vapors. There are no air quality benefits from Stage II controls when refueling cars equipped with ORVR, and in the case of vacuum-assist Stage II systems, there can be increased air emissions. While there will be a short-term emissions increase when vehicles without ORVR are refueled once Stage II is removed, after 2015 overall statewide emissions will be reduced as a result of removing Stage II as older non-ORVR cars are replaced. In addition, the proposed revisions to Stage I will reduce emissions from GDFs by: 1) increasing the number of facilities required to upgrade their Stage I systems; 2) requiring that within 180 days of the effective date of the amendments, all facilities upgrade their Stage I systems by installing CARB-certified PV vent valves and rotatable adaptors; and 3) requiring all facilities, when replacing Stage I components, to install EVR components. Therefore, MassDEP believes that the proposed amendments do not lessen the overall stringency of vapor recovery requirements at facilities.

#### **F. Public Participation**

The proposed amendments were developed with extensive input from stakeholders. Information about stakeholder meetings and documents reviewed is available at:

[www.mass.gov/eea/agencies/massdep/air/programs/stage-ii-vapor-recovery.html#3](http://www.mass.gov/eea/agencies/massdep/air/programs/stage-ii-vapor-recovery.html#3). MassDEP will hold a public hearing on the proposed amendments in accordance with M.G.L c. 30A and will publish a notice of the hearing and comment period at least 30 days before the public hearing. MassDEP will submit the final amendments to EPA for approval as a revision to its State Implementation Plan.

## Attachment 1

To determine the impact of removing its Stage II Program, MassDEP used the methods presented in EPA’s guidance document, “Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures.”<sup>34</sup> Specifically, MassDEP used Equation #1 to calculate the impact on Massachusetts’ refueling emissions inventory, and used Equation #3 to calculate the impact on Massachusetts’ area-wide VOC inventory.

The equations and inputs are presented below.

**Equation 1:**  $\text{Increment}_{2013} = (Q_{\text{SII}})(1 - Q_{\text{ORVR}_{2013}})(\eta_{2013\text{uSII}}) - (Q_{\text{SIIva}})(\text{CF}_{2013})$

Equation 1 quantifies the annual emissions control gain (projected for 2013) from Stage II installations at GDFs as ORVR technology phases in. There are five inputs for this equation. EPA’s Guidance Document includes input default values for states that lack state-specific data. The EPA default values and as the Massachusetts-specific values are shown, below.

In Massachusetts, 99% of annual gasoline throughput is covered by Stage II<sup>35</sup> and of this total, 84.9% is dispensed to vehicles that have on-board vapor recovery technology (ORVR)<sup>36</sup>. EPA estimates that, depending upon variations in programs across the U.S., Stage II controls achieve a range of between 60% and 75% vapor control efficiency. Due to its comprehensive annual testing and certification requirements, MassDEP’s Stage II program is on the upper end of that efficiency range at an estimated 70% in-use control efficiency. MassDEP’s Stage II program data shows that 81% of annual gasoline throughput is dispensed via vacuum-assist Stage II systems. The compatibility factor (CF) represents the increase in underground storage tank vent pipe emissions over the normal breathing/emptying loss emissions and is calculated using a constant (0.0777).

	EPA Default	MA-Specific
$Q_{\text{SII}}$ = Fraction of gasoline throughput covered by Stage II	0.95-0.98	0.99
$Q_{\text{ORVR}_{2013}}$ = Fraction of gasoline dispensed to ORVR vehicles	0.81	0.849
$\eta_{2013\text{uSII}}$ = Stage II in-use control efficiency	0.60 – 0.75	0.70
$Q_{\text{SIIva}}$ = Fraction of gasoline throughput dispensed to vacuum assist type Stage II	varies by state	0.81
$\text{CF}_{2013}$ = Compatibility Factor = $(0.0777) \times (Q_{\text{ORVR}_{2013}})$	0.0629	0.0659

Increment<sub>2013</sub> using MA-specific parameters:

$$\text{Increment}_{2013} = (0.99)(1 - 0.849)(0.70) - (0.81)(0.0659) = 0.0512$$

**Increment<sub>2013</sub> = 5.12%**

**Conclusion:** During the year 2013, MassDEP estimates that the Stage II program achieves an emissions control increment of 5.12%

<sup>34</sup> *Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures*, U.S. EPA Office of Air Quality Planning and Standards (EPA-457/b-12-011)

<sup>35</sup> Analysis of MassDEP Stage II Program data, September 2013.

<sup>36</sup> *Air Program Support for Stage I and Stage II Programs in Massachusetts*, Eastern Research Group, Inc. and de la Torre-Klausmeier Consulting, August 12, 2012 Addendum

**Equation 3:**  $Tons_{2013} = (Increment_{2013})(GC_{2013})(EF)$

Equation 3 quantifies the total annual emissions control provided by Stage II during the year 2013. This equation has three inputs. The increment for 2013 is the output from Equation 1. The projected gasoline consumption was estimated by applying a national growth factor<sup>37</sup> to the 2012 annual gasoline consumption reported by the Massachusetts Department of Revenue. The uncontrolled refueling displacement refueling emissions factor was calculated by using a formula in EPA's Stage II guidance.  $Increment_{2013}$  = Increment calculated from Equation 1.

$GC_{2013}$  = Projected annual gasoline consumption in 2013: 2,584,209,288 gallons.

EF = Uncontrolled displacement refueling emission factor: 6.6 lbs/1,000 gallons.

$$EF = (g/gal) = \exp[-1.2798 - 0.0049(\Delta T) + 0.0203(T_d) + 0.1315(RVP)]$$

Where  $T_d$  = dispensed fuel temperature (74°F);  $\Delta T$  = difference between tank fuel temperature and dispensed fuel temperature (11.4°F); RVP = ozone season gasoline Reid Vapor Pressure (7.0 psi).

$Tons_{2013}$  using MA-specific parameters:

$$Tons_{2013} = (0.0512)(2,584,209,288 \text{ gal/yr})(6.6 \text{ lbs/1,000 gallons})(1 \text{ ton/2,000 lbs}) = 436.71 \text{ tons per year}$$

$$Tons_{2013} = \mathbf{436.71 \text{ tpy} = 1.20 \text{ tons per summer day}^{38}}$$

Conclusion: The overall emissions increase from removing Stage II is approximately 437 tons of VOCs per year. This translates to 1.2 tons per summer day.

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<sup>37</sup> Massachusetts Department of Revenue reported 2012 gasoline consumption (2,584,209,288 gallons) multiplied by the Energy Information Administration's (EIA) projected annual gasoline consumption growth factor for 2012 to 2013: no change, so the factor is 1. *Annual Energy Outlook 2013, Table A11 Liquid fuels supply and disposition.* U.S. Energy Information Administration.

<sup>38</sup> Since Stage II systems operate 7 days per week, there are 92 summer days of Stage II operations during the 13 weeks of summer. Tons per summer day = [(436.71 tons/year) x (92 summer days/365 days per year = 0.252)]/(92 days) .