

APPENDIX G

REASONABLY AVAILABLE CONTROL MEASURES ANALYSIS

2016-015-SIP-NR

Proposal
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1. INTRODUCTION

Under the 2008 eight-hour ozone National Ambient Air Quality Standard (NAAQS), the Houston-Galveston-Brazoria 2008 eight-hour ozone nonattainment area (HGB area), consisting of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties, was classified as a marginal nonattainment area with a July 20, 2015 attainment deadline (77 FR 30088, May 21, 2012). The HGB area did not attain the 2008 eight-hour ozone standard in 2014 but qualified for a one-year attainment date extension in accordance with Federal Clean Air Act (FCAA), §181(a)(5). The United States Environmental Protection Agency (EPA) granted a one-year extension on May 4, 2016, extending the HGB area's attainment deadline to July 20, 2016 with a 2015 attainment year (81 FR 26697). Because the HGB area's 2015 design value of 80 ppb exceeded this standard, the FCAA requires the area to be reclassified from marginal to moderate nonattainment and the state is required to submit an attainment demonstration SIP revision that addresses the 2008 eight-hour ozone standard moderate nonattainment area requirements. As indicated in the EPA's 2008 ozone standard SIP requirements rule, the attainment deadline for moderate classification is July 20, 2018 with an attainment year of 2017 (80 FR 12264, March 6, 2015).

Nonattainment areas classified as moderate and above are required to meet the mandates of the Federal Clean Air Act (FCAA) under §§172(c)(1), 182(b)(2), and 182(f). FCAA, §172(c)(1) requires states to provide for implementation of all reasonably available control measures (RACM) as expeditiously as practicable and to include RACM analyses in the state implementation plan (SIP). In the general preamble for implementation of the FCAA Amendments published in the April 16, 1992 issue of the *Federal Register* (57 FR 13498), the EPA explains that it interprets FCAA, §172(c)(1) as a requirement that states incorporate into their SIP all RACM that would advance a region's attainment date; however, states are obligated to adopt only those measures that are reasonably available for implementation in light of local circumstances. In the general preamble, the EPA provided guidelines to help states determine which measures should be considered reasonably available:

If it can be shown that one or more measures are unreasonable because emissions from the sources affected are insignificant (i.e. de minimis), those measures may be excluded from further consideration... the resulting available control measures should then be evaluated for reasonableness, considering their technological feasibility and the cost of control in the area to which the SIP applies...In the case of public sector sources and control measures, this evaluation should consider the impact of the reasonableness of the measures on the municipal or other government entity that must bear the responsibility for their implementation.

On July 2, 2002, the United States (U.S.) Court of Appeals upheld the EPA's definition of RACM, including the consideration of economic and technological feasibility, ability to cause substantial widespread and long-term adverse impacts, collective ability of the measures to advance a region's attainment date, and whether an intensive or costly effort will be required to implement the measures.

2. CONTROL STRATEGY DEVELOPMENT PROCESS

2.1. Stationary Sources

The TCEQ used a two-step process to develop the list of potential stationary source control strategies evaluated during the RACM analysis for the HGB Attainment Demonstration (AD) SIP for the 1997 eight-hour ozone NAAQS submitted to the EPA on April 6, 2010. The same list was used for this HGB AD SIP revision. First, the TCEQ compiled a list of potential control strategy concepts based on an initial evaluation of the existing control strategies in the HGB area and existing sources of volatile organic compounds (VOC) and nitrogen oxides (NO_x) in the HGB area. The EPA allows states the option to consider control measures outside the ozone nonattainment area that can be shown to advance attainment; however, consideration of these sources is not a requirement of the FCAA. A draft list of potential control strategy concepts was developed from this initial evaluation. The TCEQ also invited stakeholders to suggest any additional strategies that might help advance attainment of the HGB area. The final list of potential control strategy concepts for the RACM analysis includes the strategies on the initial draft list and the strategies suggested by stakeholders during the informal stakeholder comment process. Table G-1: *HGB Area Stationary Source RACM Analysis* presents the final list of potential control measures for stationary sources as well as the RACM determination for each measure.

2.2. On-Road and Non-Road Mobile Sources

The control strategy development process to identify potential control strategies for RACM analysis of on-road and non-road mobile sources was similar to the process used for stationary sources. Table G-2: *HGB Area On-Road and Non-Road Mobile Sources RACM Analysis* presents the final list of potential control measures for on-road and non-road mobile sources as well as the RACM determination for each measure. The control strategy concepts included in Table G-2 were taken from suggestions solicited through the stakeholder process and consultation with the Houston-Galveston Area Council (H-GAC) during SIP development for the [Houston-Galveston-Brazoria Attainment Demonstration State Implementation Plan Revision for the 1997 Eight-Hour Ozone Standard](http://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/hgb_sip_2009/09017SIP_completeNarr_ado.pdf) (Project No. 2009-017-SIP-NR). (http://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/hgb_sip_2009/09017SIP_completeNarr_ado.pdf)

3. RACM EVALUATION APPROACH

Each control measure identified through the control strategy development process was evaluated to determine if the measure would meet established criteria to be considered reasonably available. The TCEQ used the general criteria specified by the EPA in the proposed approval of the New Jersey RACM analysis published in the January 16, 2009 issue of the *Federal Register* (74 FR 2945):

RACM is defined by the EPA as any potential control measure for application to point, area, on-road and non-road emission source categories that meets the following criteria:

- *The control measure is technologically feasible.*
- *The control measure is economically feasible.*
- *The control measure does not cause “substantial widespread and long-term adverse impacts.”*

- *The control measure is not “absurd, unenforceable, or impracticable.”*
- *The control measure can advance the attainment date by at least one year.*

The EPA did not provide guidance in the *Federal Register* notice on how to interpret the criteria “advance the attainment date by at least one year.” Considering the July 20, 2018 attainment date for this attainment demonstration, the TCEQ evaluated this aspect of RACM based on advancing the attainment deadline by one year, to July 20, 2017.

In order for a control measure to “advance attainment,” it would need to be implemented prior to the beginning of ozone season in the attainment year, so suggested control measures that could not be implemented by January 1, 2017 could not be considered RACM because the measures would not advance attainment. To “advance the attainment date by at least one year” to July 20, 2017, suggested control measures would have to have been fully implemented by January 1, 2016 which has already passed. In order to provide a reasonable amount of time to fully implement a control measure, the following must be considered: availability and acquisition of materials; the permitting process; installation time; and the availability of and time needed for testing.

The TCEQ also considered whether the control measure was similar or identical to control measures already in place in the HGB area. If the suggested control measure would not provide substantive and quantifiable benefit over the existing control measure, then the suggested control measure was not considered RACM because reasonable controls were already in place.

4. STATIONARY SOURCE RACM DETERMINATION AND DISCUSSION

4.1. General Discussion

The TCEQ determined that no potential control measures met the criteria to be considered RACM. All potential control measures evaluated for stationary sources were determined to not be RACM due to the inability to implement control measures early enough to advance attainment of the 2008 eight-hour ozone NAAQS. Based on a July 20, 2018 attainment deadline, a control measure would have to be in place prior to the beginning of ozone season in the attainment year to be considered RACM, or January 1, 2017. The complete list of stationary source potential control measures and additional details on the specific RACM determinations for each control measure are included in Table G-1.

4.2. NO_x RACM Analysis

Additional NO_x control measures cannot be implemented in time to advance attainment of the 2008 eight-hour ozone NAAQS in the HGB area. For this reason and for the other reasons identified in Table G-1 of this appendix, no NO_x control measures are included as RACM for this SIP revision.

The TCEQ has already implemented stringent and innovative regulations to address NO_x emissions from stationary sources for the HGB severe nonattainment area under both the one-hour ozone NAAQS and the 1997 eight-hour ozone NAAQS. The mass emissions cap and trade (MECT) program and accompanying Chapter 117 rules and the emission specifications for attainment demonstration (ESAD) for major institutional

and industrial sources, major source electric generating units (EGU), and minor source engines, represents some of the most comprehensive NO_x control strategies in the nation. These controls continue to apply in the HGB area under the 2008 eight-hour ozone NAAQS.

4.3. VOC RACM Analysis

Additional VOC control measures cannot be implemented in time to advance attainment of the 2008 eight-hour ozone NAAQS in the HGB area. In addition, the HGB area is primarily NO_x-limited with respect to ozone formation due to the abundance of naturally-occurring VOC emissions in the area, making additional VOC reductions much less effective than NO_x reductions at lowering ozone levels. Based on prior modeling sensitivity matrix analyses, the TCEQ determined that reductions in general VOC emissions, i.e., non-highly reactive volatile organic compounds (HRVOC), will not advance attainment of the HGB area. For these reasons and for the other reasons identified in Table G-1 of this appendix, no VOC control measures are included as RACM for this SIP revision.

5. ON-ROAD AND NON-ROAD MOBILE SOURCE RACM DETERMINATION AND DISCUSSION

5.1. General Discussion

Based on the RACM analysis, the TCEQ determined that no potential on-road or non-road mobile source control measures met the criteria to be considered RACM. All potential control measures evaluated for mobile sources were determined to not be RACM due to technological or economic feasibility, enforceability, adverse impacts, or ability of the measure to advance attainment of the NAAQS. As discussed in Section 4.1 of this appendix, the inability to advance attainment is the primary determining factor in the RACM analyses. Additional control measures are not necessary for the area to demonstrate attainment by the attainment date and it is not possible for the TCEQ to implement any control measures that would provide for earlier attainment of the NAAQS. The complete list of on-road and non-road mobile source potential control measures and the specific details for each RACM determination are included in Table G-2 of this appendix.

5.2. Texas Emissions Reduction Plan (TERP)

The TCEQ understands the desire to use the TERP as a control measure that can be considered in the modeling. However, the TCEQ determined that for this attainment demonstration SIP revision it was more appropriate to consider the TERP as a weight of evidence measure in support of other measures where the emissions reductions can be better defined and modeled. The use of the TERP as a weight of evidence measure is in recognition of several factors: uncertainty in the amount of TERP funding appropriated to the agency from year to year; the fact that the TERP programs are voluntary and participation and effectiveness may vary; and other factors making it difficult to project emissions reductions to the level of certainty appropriate for including in the SIP commitments and modeling.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
TCEQ Initial Control Strategy Concepts for HGB Eight-County Region Controls				
Expand the definition of HRVOC in §115.10 to include additional VOC species under the requirements of Chapter 115 HRVOC rules and Chapter 101 HRVOC Emissions Cap and Trade (HECT) Program.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
In lieu of expanding the definition of HRVOC, create separate rules to address other VOC emissions from vents, flares, and cooling towers.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Reduce HECT cap for Harris County in §101.394(a)(1).	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Revoke exemptions (§§115.727(f), 115.767(6), and 101.392(c)) from site-wide caps in HRVOC rules for 7-surrounding counties and reduce cap in §101.394(a)(2).	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Revise general VOC fugitive rules in Chapter 115 Subchapter D, Division 3 and apply more stringent leak detection and repair (LDAR) requirements from HRVOC rules.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Require monitoring of steam/air assist rates on assisted flares to help ensure proper operation and prevent decreased efficiency from improper operation such as over-steaming.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
General VOC monitoring rules with enhanced monitoring for flares, cooling towers, process vents, and pressure relief valves.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Additional VOC controls for wastewater systems.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
Additional VOC controls for upstream oil/gas VOC emissions.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
Eliminate certain storage tank exemptions in Chapter 115 rules.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Storage tank design improvements such as hanging roof in lieu of roof supported by legs.	VOC	Point	N	Measure cannot be implemented in time to advance attainment. Reasonable controls are already in place.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Increase control efficiency requirements in Chapter 115 rules such as vent gas control, loading, and storage.	VOC	Point & Area	N	<p>Measure cannot be implemented in time to advance attainment.</p> <p>Concurrent with this SIP revision, the commission is adopting rulemaking to implement FCAA VOC reasonably available control technology (RACT) requirements for VOC storage tanks (Rule Project Number 2016-039-115-AI). These control measures are not being adopted for RACM purposes.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
<p>Consumer and commercial products control techniques guidelines.</p> <ul style="list-style-type: none"> • Group II - lithographic printing materials, letterpress printing materials, flexible packaging printing materials, flat wood paneling coatings, industrial cleaning solvents. • Group III - paper, film, and foil coatings, metal furniture coatings, large appliance coatings. • Group IV - miscellaneous metal and plastic products coatings, fiberglass boat manufacturing materials, miscellaneous industrial adhesives, auto and light duty truck original equipment manufacturer coatings. 	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
<p>Controls to reduce VOC emissions from lightering on barges and marine vessels.</p>	VOC	Area	N	<p>Measure cannot be implemented in time to advance attainment.</p> <p>Lightering in ship channel is typically only done on emergency basis. Most lightering occurs offshore.</p>
<p>VOC controls for salt dome storage facilities for brine handling/degassing and fugitive LDAR.</p>	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Refinery coker VOC emission controls.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
Require sources to develop and implement flare minimization plans.	VOC & NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Best Management Practices via agreed orders or other mechanisms.	NO _x & VOC	Point & Area	N	Reasonable controls are already in place. Voluntary best management practices already in place.
Energy efficiency measures associated or in conjunction with MECT revisions.	NO _x	Area	N	Not quantifiable. Not enforceable.
Additional NO _x reductions through Chapter 117 and the Chapter 101 Mass Emission Cap & Trade (MECT) Program by revising emission specifications, revoking exemptions, expanding applicability, and resetting baseline activity years.	NO _x	Point & Area	N	Measure cannot be implemented in time to advance attainment. Further reductions in the NO _x MECT program from existing sources are not economically feasible. Reductions from exempt sources is either not technically feasible or not economically feasible.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Controls for portable engines such as portable generators and other engines considered non-stationary due to temporary service.	NO _x	Area	N	Measure cannot be implemented in time to advance attainment. Emission reduction benefit not quantifiable.
Engine registration program for stationary and/or portable engines to help ensure better enforcement of applicable requirements, improve rule effectiveness, and proper accounting of engines in EI.	NO _x	Area	N	Not quantifiable.
Transport Controls (Outside HGB Area)				
NO _x controls on major sources for selected source categories within 200 kilometer (km) range that impact the HGB area.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
NO _x controls on minor sources for selected source categories within 200 km range that impact the HGB area.	NO _x	Area	N	Measure cannot be implemented in time to advance attainment.
HRVOC controls for flares, vents, cooling towers, and fugitives at sources within 100 km range that impact the HGB area using the current list of HRVOC (ethylene/propylene) or additional VOC.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Extend new upstream oil/gas flash emission, degassing, storage tank rules to sources within 100 km range that impact the HGB area.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
NO _x controls on engines within 200 km range that impact the HGB area.	NO _x	Point & Area	N	Measure cannot be implemented in time to advance attainment.
NO _x controls on power plants within 200 km range that impact the HGB area.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
VOC and NO _x controls on paper mills within 100 or 200 km range that impact the HGB area.	VOC & NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
General VOC enhanced monitoring rules for flares, cooling towers, process vents, and PRVs at sources within 100 km range that impact the HGB area.	VOC	Point & Area	N	Measure cannot be implemented in time to advance attainment.
Potential Measures/Concepts Suggested by Stakeholders				
Manage livestock wastes by transporting them out of the HGB nonattainment area for management and or requiring the use of air pollution control systems.	VOC	Area	N	Transport of waste out of area would likely result in increased NO _x emissions from transport vehicles.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Require the use of air pollution control systems at feedlots and animals waste lagoons.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Provide incentives for improved management techniques to reduce the frequency and quantity of pesticide applications.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Limit the allowable VOC content of pesticides. Identify lowest achievable limits through review of California and Ozone Transport Commission regulations.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Increase the stringency of existing control requirements for asphalt paving/roofing (30 TAC 115, Subchapter F, Division 1).	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Provide incentives to convert from cutback asphalt to low-emission emulsion asphalt and hot-mix asphalt.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Adopts South Coast Air Quality Management District content limit for emulsified asphalt (50% reduction).	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Restrict or prohibit the use of VOC-based parking lot sealers.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Require the use of emission controls on cutback asphalt application equipment used by commercial roofers, etc. Controls could include the use of close fitting lids and restrictions on operating temperatures and or require the use of afterburners on the kettles.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Increase stringency of existing surface coating VOC limits. Identify lowest achievable limits through review of California and Ozone Transport Commission regulations.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Eliminate or reduce the scope of the surface coating emission limitation exemptions (30 TAC §115.427).	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Require the use of or provide incentives for using ozone-destroying catalyst coatings.	Ozone	Area	N	<p>Not quantifiable.</p> <p>Not demonstrated technically feasible to actually reduce ozone in manner to advance attainment.</p> <p>Potential small business/private citizen economic impact.</p> <p>Potential adverse impacts to water quality.</p>
Consider VOC reactivity in establishing VOC coating content or requiring the use of air pollution controls.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Review existing list regulated sources (30 TAC 115, Subchapter E, Solvent-Using Processes, Division 2, Surface Coating Processes) and establish emission limits for those sources currently excluded.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
<p>Establish recording and reporting requirements for industrial and non-industrial chlorine use for possible opportunities to reduce chlorine emissions.</p>	<p>Chlorine</p>	<p>Point & Area</p>	<p>N</p>	<p>Not an actual emission reduction control measure. Unknown whether additional controls on chlorine sources beyond current permitting requirements are technologically feasible.</p> <p>Reduction in anthropogenic chlorine emissions will not advance attainment. Natural sources of chlorine (e.g., Gulf of Mexico) are expected to far exceed anthropogenic sources.</p>
<p>Provide financial assistance for performing energy audits and or implementation of energy saving measures that reduce demand and emissions from electric generating units (EGUs) and/or heating systems.</p>	<p>NO_x</p>	<p>Area</p>	<p>N</p>	<p>Not enforceable. TCEQ does not have legislative funding to implement. Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p> <p>Not quantifiable.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Revise building codes to require energy efficient designs and materials that reduce demand and emissions from EGUs and/or heating systems. Measures could include more insulation, use of reflective glass, use or reflective paints, use of multi-paned glass, use of white or reflective roofs (International Energy Conservation Code - IECC).	NO _x	Area	N	Not enforceable. TCEQ has no authority to implement. Not quantifiable.
Mandatory public building compliance with IECC.	NO _x	Area	N	Not enforceable. TCEQ has no authority to implement. Not quantifiable.
Require that a certain percentage of power purchased for public facilities come from renewable or non-emitting sources.	NO _x	Area	N	Not enforceable. TCEQ has no authority to implement. Not quantifiable.
Provide incentives for energy conservation measures such as timed lighting for parking lots, outdoor advertisements and buildings, occupancy sensors for office lighting, and for turning off computers.	NO _x	Area	N	Not enforceable. TCEQ has no authority to implement. Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM. Not quantifiable.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide incentives for using energy efficient PC networks (shutdown of computers when not in use).	NO _x	Area	N	<p>Not enforceable. TCEQ has no authority to implement.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p> <p>Not quantifiable.</p>
Prohibit or restrict the burning of leaves and yard clippings or require the application of emission controls.	VOC	Area	N	Outdoor burning rules are already established under 30 TAC Chapter 111, Subchapter B.
Establish new consumer product VOC limits (California Air Resources Board - Cons 1 and 2).	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Adopt South Coast Air Quality Management District (SCAQMD) Phase III VOC limits.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Adopt CARB rules regarding mid-term and or long-term limits on VOC content of consumer products.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide incentives for the substitution on non-VOC based cleaners for VOC based cleaners.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Require the use of or provide incentives for the reformulation of VOC bearing commercial products such as paints, cleaners, etc.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Limit automotive windshield washer fluid to less than the 23.5% VOC currently allow by 30 TAC 115, Subchapter G, Division 1.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Adopt Ozone Transport Commission Model Rule with additional product coverage and more stringent VOC limits.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Increase stringency of existing control requirements in 30 TAC 115, Subchapter E, Division 1. This could include measures requiring the use of low VOC solvents for cold cleaning operations or replacement with wipe cleaning.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Put one-hour ozone contingency rules in 30 TAC 115, Subchapter F, Division 4 into effect.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Increase solvent recovery requirement in 30 TAC 115.552(a) from 85% to 90% or greater. Contingency rules must be put into effect first.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Lower or eliminate the 2,000 gallon per year use exemption in 30 TAC 115.557. Contingency rules must be put into effect first.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Establish emission control requirements for food product manufacturing and processing operations.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Require the use of catalytic oxidizers or equivalent controls on chain drive char-broilers.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Establish limits for the VOC content of charcoal lighter fluid.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Replace fuel dispensing hoses to reduce permeation.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Extend Stage I vapor recovery system requirements to counties outside of the HGB nonattainment area.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Eliminate or reduce the Stage I vapor recovery exemptions in 30 TAC 115.227.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Adopt CARB enhanced vapor recovery Stage I requirements (98% control) in HGB nonattainment area and potentially surrounding counties.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Extend the transport vehicle leak test provisions of 30 TAC 115, Subchapter C, Division 3, to counties outside of the HGB nonattainment area.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Eliminate or reduce the transport vehicle leak test exemptions in 30 TAC 115.237.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Extend Stage II vapor recovery system requirements to counties outside of the HGB nonattainment area.	VOC	Area	N	Stage II equipment can be decommissioned starting May 16, 2014.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Eliminate or reduce the Stage II vapor recovery exemptions in 30 TAC 115.247.	VOC	Area	N	A SIP revision authorizing the decommissioning of Stage II vapor control equipment was approved by the EPA on March 17, 2014. Facilities may continue operating Stage II until August 31, 2018.
Implement a “stop at the click” awareness program to discourage overfilling of vehicles during refueling.	VOC	Area	N	Measure cannot be implemented in time to advance attainment. Not quantifiable.
Implement an off-road equipment fuel tank program.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Develop and implement emission control measures for hair and nail salons.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Extend municipal landfill emission control requirements to counties outside of HGB nonattainment area.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Regulate emissions from the excavation of landfills.	VOC	Area	N	Unknown technical feasibility with controlling emissions during excavation. Measure cannot be implemented in time to advance attainment.
Require the use of co-composting operations to limit VOC emissions. Includes the mixing of bio-solids or manure with bulking agents.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Establish emission limits or control requirements for glycol dehydration units (oil and gas production). Emission limits could build upon emission limits established by 40 CFR 63, Subpart HH, to control hazardous air pollutants (HAP) emissions from glycol dehydration units.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Require implementation of instrument based fugitive emissions monitoring and leak repair programs at oil and gas production facilities.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Establish requirements or provide incentives for the use of NO _x emission reduction software.	NO _x	Area	N	Not enforceable. Not quantifiable.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide additional incentives for the use of low-emitting, distributed power generating systems such as wind, solar, micro-turbines, fuel cells, etc., reducing the demand and associated emissions from EGUs.	NO _x	Area	N	<p>Not enforceable.</p> <p>Not quantifiable.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
<p>Provide additional incentives for the capture of landfill gas for use in combustion turbines to generate electricity, reducing the demand and associated emissions from EGUs.</p>	<p>NO_x</p>	<p>Area</p>	<p>N</p>	<p>Not enforceable.</p> <p>Not quantifiable.</p> <p>May actually increase emissions of NO_x due to NO_x control technology limits specific to landfill gas. Siloxanes in landfill gas contaminant catalysts limiting NO_x control technology options on units firing landfill gas.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p>
<p>Explore technologies and opportunities to reduce transmission in losses with resulting reductions in demand and associated emissions from EGUs.</p>	<p>NO_x</p>	<p>Area</p>	<p>N</p>	<p>Not enforceable.</p> <p>Not quantifiable.</p> <p>Not demonstrated technologically feasible.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Establish more stringent VOC content limitations and or emission control requirements for rotogravure and flexographic printing operations than specified in 30 TAC 115, Subchapter E, Division 3.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Eliminate or reduce the rotogravure and flexographic printing emission control exemptions in 30 TAC 115.437.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Eliminate or reduce the offset lithographic printing emission control exemptions in 30 TAC 115.437.	VOC	Area	N	Measure cannot be implemented in time to advance attainment.
Partner with local governments in efforts to reduce urban heat island effects and thus reduce EGU demand and associated emissions.	NO _x	Area	N	Not enforceable. Not quantifiable.
Investigate opportunities to improve local policies toward energy efficiency.	NO _x	Area	N	Not enforceable. Not quantifiable.
Implement efficiency based natural gas rates to reward conservation	NO _x	Area	N	Not enforceable. TCEQ has no authority to implement.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide incentives for companies to buy energy efficient products.	NO _x	Area	N	Not enforceable. Not quantifiable. Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.
Provide incentives for companies and individual consumers to replace older, energy inefficient appliances with new Energy Star products.	NO _x	Area	N	Not enforceable. Not quantifiable. Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide incentives for companies and individual consumers to replace energy inefficient heating and air conditioning systems with new, more efficient units.	NO _x	Area	N	<p>Not enforceable.</p> <p>TCEQ has no authority to implement.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p> <p>Not quantifiable.</p>
Implement public awareness campaigns for energy efficiency.	NO _x	Area	N	<p>Not enforceable.</p> <p>Not quantifiable.</p>
Provide incentives for cities and counties to promote and encourage development patterns that reduce emissions of air pollutants.	NO _x & VOC	Area	N	<p>Not enforceable.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p> <p>Not quantifiable.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Implement a ban on new developments that would result in any increase in air pollutants.	NO _x & VOC	Area	N	Not enforceable. Both the Federal Clean Air Act and Texas law do not allow TCEQ to deny a permit application based solely on the fact it is a new source.
Establish mitigation fees for land development and other projects that result in additional area source emissions that are proportional to the anticipated increase in NO _x and or VOC emissions.	NO _x & VOC	Area	N	Not quantifiable in terms of actual reduction benefit.
Promote or require the planting trees (reduce EGU demand and emissions) and the use of plants that require less maintenance (reduce emissions from landscape maintenance equipment).	NO _x & VOC	Area	N	Not enforceable. Not quantifiable.
Require mitigation of trees removed during development.	NO _x	Area	N	Not enforceable. Not quantifiable.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide financial incentives to developers and homeowners to use or convert to plants that require less maintenance (reduced emissions from landscape maintenance equipment).	NO _x	Area	N	<p>Not enforceable.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p> <p>Not quantifiable.</p>
Establish emission control requirements for publicly owned wastewater treatment facilities.	VOC	Area	N	<p>Measure cannot be implemented in time to advance attainment.</p>
Establish requirements and/or provide incentives for the replacement of pilot lights on gas stoves with electronic ignitions.	NO _x	Area	N	<p>Potential technical feasibility issues with retrofit of household appliances.</p> <p>Not enforceable.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
<p>Establish requirements and/or provide incentives for the replacement of hot water heater pilot ignitions with electronic ignitions.</p>	<p>NO_x</p>	<p>Area</p>	<p>N</p>	<p>Unknown technical feasibility to retrofit household appliances.</p> <p>Not enforceable.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p>
<p>Establish requirements and/or provide incentives for the use of low NO_x hot water heaters.</p>	<p>NO_x</p>	<p>Area</p>	<p>N</p>	<p>Not enforceable. Legislative prohibition on requiring NO_x limits less than 40 ng/J on residential water heaters (HB 965, 80th Legislature, 2007). Current Chapter 117 water heater rule establishes limit at 40 ng/J on residential water heaters.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Establish requirements and or provide incentives for the replacement of hot water heaters with on-demand heat exchange systems.	NO _x	Area	N	<p>Tank-less or on-demand water heaters are currently exempt from Chapter 117 water heater rules so the incentives to purchase tank-less water heaters are already in place.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p>
Prohibit or restrict the sale and use of wood burning fireplaces and wood burning stoves in the HGB nonattainment area.	VOC	Area	N	<p>Measure cannot be implemented in time to advance attainment.</p> <p><i>De minimis</i> emissions and use is likely only during winter non-peak ozone months.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
<p>Establish requirements and or provide incentives for the replacement of residential combustion sources with lower emitting sources (replacing natural gas fired units with electric units, for example).</p>	NO _x	Area	N	<p>Not enforceable.</p> <p>TCEQ does not have the authority to mandate the installation of specific equipment types.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p>
<p>Eliminate NO_x MECT program and revert to source-by source emission limitations with limits set equal to Lowest Achievable Emission Rate technology or other.</p>	NO _x	Point	N	<p>NO_x MECT Program provides most efficient means to achieve cost effective reductions.</p> <p>Additional NO_x control on existing MECT sources cannot be implemented in time to advance attainment.</p>
<p>Establish source by source emission limits (not cap and trade) on HRVOC and or other VOCs for sources located outside of the HGB nonattainment area.</p>	VOC	Point	N	<p>Measure cannot be implemented in time to advance attainment.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Eliminate HRVOC cap and trade program and control emissions exclusively through source by source emission limitations in the HGB nonattainment area.	VOC	Point	N	HECT Program provides most cost effective means to achieve reductions.
Revise or eliminate some or all exemptions (30 TAC 117.203) for NO _x MECT applicability, including temporary sources (such as engines in test cells), sources in limited use applications (exemptions for emergency generators and diesel engines installed prior to October 1, 2001), heat treat and reheat furnaces rated less than 20 MMBtu/hr, incinerators rated less than 40 MMBtu/hr, boilers and process heaters rated 2 MMBtu/hr or less, dryers and ovens, chemical processing gas turbines and flares.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Extend NO _x MECT (Mass Emissions Cap & Trade) program to stationary sources that are currently not subject to program requirements (facilities where no Emission Specification for Attainment Demonstration has been established).	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Eliminate the distinction between major and small sources, applying the Emission Specifications for Attainment Demonstration found in 30 TAC 117.206 to all sources regardless of site-wide potential to emit.	NO _x	Point	N	Chapter 117 HGB Minor Source Rule already establishes unit-by-unit emission limits for non-MECT engines, boilers, process heaters, and turbines at minor sources. Adverse economic impact by holding small businesses to more stringent standards.
Eliminate the exemption for sources with uncontrolled emissions at design capacity of less than 10 tons/year.	NO _x	Point & Area	N	Chapter 117 HGB Minor Source Rule already establishes unit-by-unit emission limits for non-MECT engines, boilers, process heaters, and turbines at minor sources.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide financial incentives for demand side management.	NO _x	Point	N	<p>Not enforceable.</p> <p>Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.</p> <p>Not quantifiable.</p>
Provide additional financial incentives for reducing emissions by increasing the annual fee paid on NO _x emissions.	NO _x	Point	N	<p>Not quantifiable in terms of actual tons of reductions. Increasing emissions fees does not ensure reduction in actual emissions.</p>
Include engines located at EGUs in NO _x MECT program.	NO _x	Point	N	<p>Measure cannot be implemented in time to advance attainment.</p>

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide financial incentives for investment in lower polluting or non-polluting power generation technologies.	NO _x	Point	N	Not quantifiable. Any legislative funding for such incentive programs is not permanent; therefore, incentive programs do not meet criteria to be SIP creditable or RACM.
Extend NO _x MECT program to combustion sources located outside of the HGB nonattainment areas. Inclusion could be limited to larger, more numerous industrial sources (industrial, commercial, institutional boilers, process heaters, large engines, large turbines, smelter furnaces, cement and brick kilns, etc.) or could include the same source categories covered by the HGB SIP.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Implement separate NO _x cap and trade program for sources located outside of the HGB nonattainment area.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Lower NO _x MECT cap by reallocating allowances based on lower Emission Specifications for Attainment Demonstration (1999 SIP values or other).	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Lower NO _x MECT cap reallocating allowances through across-the-board reductions.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Extend NO _x MECT program to include non-stationary engines.	NO _x	Point	N	<p>Unknown technological and economic feasibility at this time.</p> <p>Emission reduction benefit not quantifiable.</p>
Extend NO _x MECT program to EGUs outside of the HGB nonattainment area.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Expand applicability of the HRVOC cap and trade program beyond flares, process vents, cooling towers and process fugitive emissions.	VOC	Point	N	<p>The suggested measure has no quantifiable benefit. The HECT program already includes all relevant sources that have potential to emit HRVOC.</p> <p>Fugitive HRVOC emissions are controlled separately through 30 TAC Chapter 115, Subchapter H, Division 3.</p>
Extend current HRVOC cap and trade program to other VOC species and trade emissions based on reactivity.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Expand application of cap and trade concept to others sources of VOC storage tanks, loading racks, wastewater treatment operations, barge/ship loading operations	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Eliminate the HRVOC cap and trade exemption for sources with potential emissions of less than 10 tons/year.	VOC	Point	N	HRVOC sources in Harris County subject to Chapter 115 HRVOC rules but less than 10 tpy are not exempt but limited to 10 tpy. Non-HECT site, non-fugitive emissions are not a significant source of HRVOC emissions. Total non-HECT/non-fugitive HRVOC emissions for Harris County are estimated to be less than 2 tpd.
Revoke the HRVOC cap and trade exemption for sources located in the HGB nonattainment are outside of Harris County.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Extend HRVOC cap and trade program to sources located outside of the HGB nonattainment area.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Lower HRVOC cap. Reallocate allowances using existing allocation procedures but lower annual emission caps.	VOC	Point	Y	Measure cannot be implemented in time to advance attainment.
Extend 1,200 lb/hr HRVOC emission limit to sources located outside of the HGB nonattainment area.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Implement HRVOC program type monitoring requirements for other VOC emissions from flares, cooling towers, and or process vents.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Expand HRVOC fugitive monitoring requirements to other VOC species.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Expand applicability of the industrial wastewater regulations beyond the list of affected source categories in 30 TAC 115.140(1).	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Make existing industrial wastewater regulations more stringent (revise VOC reduction requirement from 90% to 95%).	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Provide additional financial incentive for reducing emissions by increasing the annual fee paid on VOC emissions.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Develop and implement more stringent guidance on Best Available Control Technology (BACT) requirements for New Source Review (NSR) authorization issued to sources in the HGB nonattainment area and potentially sources outside the HGB nonattainment area.	VOC & NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Manage composting operations. Potential control measures could include registration of composting, chipping, and grinding facilities; establish holding and or processing time requirements for green waste; and establish VOC emission control requirements.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Control emissions from airport terminals.	VOC & NO _x	Point	N	Chapter 117 Minor Source rule establishes controls for stationary NO _x sources. General conformity requirements apply to federally funded projects.
Control emissions through facility energy conservation programs.	NO _x	Point	N	Not enforceable. Not quantifiable

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Control emission from aircraft maintenance operations.	NO _x	Point	N	Chapter 117 Minor Source rule establishes controls for stationary NO _x sources. General conformity requirements apply to federally funded projects.
Revise control requirements for bakeries in 30 TAC 115.122 from 80% to 90% or greater.	VOC	Point	N	Measure cannot be implemented in time to advance attainment. De minimis emissions
Lower or eliminate the 25 tons/year threshold for requiring controls for bakeries.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Implement housekeeping practices in breweries to minimize spillage during filling, keg cleaning and waste beer processing.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Develop and implement brewery source specific wastewater treatment requirements. Alternatively, brewery sources would be subject to industrial wastewater regulations.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Establish VOC emission limitation from brewery fermentation tanks.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Require the control of emissions from dryers and heaters for cutback asphalt processes.	NO _x or VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Adopt emission limits based on retrofit BACT level of 0.07-0.1 lb/MMBtu.	NO _x	Point	N	No quantifiable reduction benefit. More stringent controls already in place either through unit by unit limits or MECT program. All emission specifications for attainment demonstration (ESADs) for boilers / process heaters and most ESADs for other sources in HGB are already less than 0.07 - 0.1 lb/MMBtu NO _x .
Adopt 90% reduction from uncontrolled emissions for EGUs.	NO _x	Point	N	Measure cannot be implemented in time to advance attainment.
Make requirements of 30 TAC 115, Subchapter D, Division 3 (equipment leaks) more stringent (similar to HRVOC monitoring).	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Lower leak detection limits for equipment leaks.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Require instrument monitoring of connectors for equipment leaks.	VOC	Point	N	Measure cannot be implemented in time to advance attainment. Rules already in place in Chapter 115 general VOC & HRVOC fugitive rules.
Require that existing flares be retrofitted to conform to 40 CFR 60.18 design standards.	VOC	Point	N	No quantifiable benefit. 40 CFR 60.18 does not have design standards, only performance criteria.
Review various California air quality district rules and regulations to identify additional emission reduction opportunities.	NO _x & VOC	Point	N	The suggestion is not a defined potential control measure. California rules were reviewed as part of research for potential strategies.
Revise control requirements in 30 TAC 115.212 for VOC loading operations from 90% to 95% or greater.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Require the use of low volume quick disconnects from railcar and tanker truck loading and unloading operations.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Require the implementation of work practices in metal production to minimize VOC in furnace charge material or require use of gas fired pre-heater where the flame directly contacts the scrap charge.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Limit repair, maintenance, cleaning and other non-production related activities on ozone alert days.	NO _x & VOC	Point	N	Measure is impractical because these activities are typically scheduled in advance and notification of ozone alerts is typically 24 hours or less and would not provide sufficient time for rescheduling the activities.
Restrict the testing of emergency generators and other support equipment on ozone alert days.	NO _x	Point	N	Already addressed by 30 TAC 117 prohibition of operation for maintenance or testing purposes between 6:00 am and noon every day, not just ozone alert days.
Revise process vent control requirements in 30 TAC 115.122(a)(1) to require at least 95% control.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
Lower allowable VOC content of surface coatings in 30 TAC 115, Subchapter E, Division 2.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Additional control of VOC emissions based on new EPA Control Technique Guidelines (CTGs).	VOC	Point and Area	N	Measure cannot be implemented in time to advance attainment.
Implementation of additional monitoring of steam and air assist flares, especially flares in HRVOC service.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.
Implementation of additional monitoring of flares in general VOC services to improve VOC inventory.	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-1: HGB Area Stationary Source RACM Analysis

Control Measure Description	Pollutant	Point /Area Source	RACM (Y/N)	RACM Analysis / Justification
<p>For flares:</p> <ul style="list-style-type: none"> • Rigorously and consistently, enforce existing flare operation requirements. • Expand and accelerate research on factors that affect flare burning efficiency, alternatives to flares, and flare monitoring. • Revise TCEQ policies/guidelines for estimating flare emissions for rulemaking, permitting, enforcement, reporting, and planning activities to take into account the effects of steam and crosswinds. • Require more extensive monitoring/reporting of flare emissions. • Increase flare gas recovery system use or other technologies, like enclosed ground flares or thermal oxidizers, to control emissions. • Use elevated flares only in emergencies and start-ups/shutdowns of equipment. 	VOC	Point	N	Measure cannot be implemented in time to advance attainment.

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis				
Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
TCEQ Initial Control Strategy Concepts for HGB Eight-County Region Controls				
Ban Segways from use on sidewalks and hike/bike trails	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Safer bike routes with better signs marking lanes and routes	NO _x and VOC	On-Road	No	Not quantifiable
Inclusion of bicycle lanes on state/federal funded thoroughfare projects	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle route signalization	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle lanes on every arterial/frontage road	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle lane/path repaving	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle route lighting	NO _x and VOC	On-Road	No	Not quantifiable
Increased bicycle/pedestrian outreach to immigrant communities	NO _x and VOC	On-Road	No	Not quantifiable
Media coverage/promotion of bicycle facilities	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle education	NO _x and VOC	On-Road	No	Not quantifiable
Region-wide mandatory bicycle racks at work sites	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Address security concerns of pedestrians/cyclists	NO _x and VOC	On-Road	No	Not quantifiable
Showers and clothing lockers	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle lockers, rack, and other storage facilities	NO _x and VOC	On-Road	No	Not quantifiable

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Biking/hiking patrols to ensure safety	NO _x and VOC	On-Road	No	Not quantifiable
Integration of bicycle/pedestrian facilities with transit	NO _x and VOC	On-Road	No	Not quantifiable
Permit bicycles on rail transit	NO _x and VOC	On-Road	No	Not quantifiable
Bicycle racks on buses	NO _x and VOC	On-Road	No	Not quantifiable
Street level shops	NO _x and VOC	On-Road	No	Not quantifiable
Give bicyclists/pedestrians the right-of-way	NO _x and VOC	On-Road	No	Not quantifiable
Cyclist/pedestrian sidewalk furniture	NO _x and VOC	On-Road	No	Not quantifiable
Sidewalks and walkways	NO _x and VOC	On-Road	No	Not quantifiable
Crosswalks	NO _x and VOC	On-Road	No	Not quantifiable
Additional pedestrian access and circulation	NO _x and VOC	On-Road	No	Not quantifiable
Pedestrian signals	NO _x and VOC	On-Road	No	Not quantifiable
Connected street system and pedestrian pass-throughs	NO _x and VOC	On-Road	No	Not quantifiable
Pedestrian design improvements	NO _x and VOC	On-Road	No	Not quantifiable
Mid-block pedestrian connections	NO _x and VOC	On-Road	No	Not quantifiable
Wide, unobstructed sidewalks on both sides of all arterials, major roads, and other streets	NO _x and VOC	On-Road	No	Not quantifiable

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis				
Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Fuel cell school buses	NO _x	On-Road	No	Technology is not readily available and is cost prohibitive
Airport use of Ultra Low Emitting Vehicle (ULEV) or electric vehicles instead of diesel for ground transportation	NO _x and VOC	On-Road	No	Measure is being voluntarily implemented through memoranda of agreement (MOAs) in the region
Propane school buses	NO _x	On-Road	No	Reductions do not advance attainment
Use solar cells to run air conditioning and other electrical equipment on METRO buses	NO _x	On-Road	No	Not quantifiable/enforceable
Locate hazardous freeway areas for possible improvements, sharp turns, clover leaves, etc.	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Limit road and highway improvements to those benefiting transit and high occupancy vehicle (HOV) lanes	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Shift highway funds to transit	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
No new peripheral highways or loops	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
California diesel fuel	NO _x	On-Road	No	Texas Low Emission Diesel (TxLED) is an enforceable rule under Texas' State Implementation Plan (SIP) and is similar to California diesel fuel
Reformulated fuels for off-road vehicles	NO _x	On-Road	No	Federal Reformulated Gas is already required in the HGB nonattainment area

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Educate public about fuel savings from properly inflated tires, regular tune-ups, and driving speed	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Celebrity volunteers for ozone alert announcements	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Air quality public outreach	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Designated truck routes	• NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Dedicated truck lanes	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Require short-haul trucks to use alternative fuels	NO _x	On-Road	No	Not quantifiable/enforceable
Ban the use of HOV lanes by trucks	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
More aggressive HOV enforcement	NO _x and VOC	On-Road	No	Requires legislative action
HOV service on all freeways with increased access	NO _x and VOC	On-Road	No	Requires legislative action
Focus on finding extreme high emitters with emphasis on finding and replacing, not penalizing	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Roadside pullovers for portable inspection/maintenance measures	NO _x and VOC	On-Road	No	Not quantifiable
High-emitting vehicle repair assistance	NO _x and VOC	On-Road	No	Not quantifiable

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Accelerated vehicle retirement program	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • The Low Income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP) is implemented in Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties • Reductions do not advance attainment
Dedicated funding for school bus replacement that requires alternative fuel vehicles	NO _x	On-Road	No	Reductions do not advance attainment
Buy vehicles older than model year 1975 to retire from use	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • The LIRAP is implemented in Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties • Reductions do not advance attainment
Expanded repair and replacement assistance program	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • The LIRAP is implemented in Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties • Reductions do not advance attainment • Requires legislative action
New vehicle discounts for old vehicle trade-ins	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • The LIRAP is implemented in Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties • Reductions do not advance attainment
Transit passes/credit in exchange for old vehicle scrappage	NO _x and VOC	On-Road	No	Not quantifiable
Ban sale of high-emitting vehicles	NO _x and VOC	On-Road	No	Requires legislative action

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Deny registration to vehicles with repeated emission failures	NO _x and VOC	On-Road	No	The TCEQ's Vehicle Registration Denial program does not allow motorists to register vehicles in ozone nonattainment areas if the vehicle failed an emissions test and has not passed a retest during the last twelve months
Increase parking at transit centers or stops	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Provide parking at all major transit stations	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Cheaper gasoline prices during evening hours	VOC	On-Road	No	Requires legislative action
Discourage people from having multiple cars	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
State and local exemptions for pooling/transit subsidies	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
No tolls for buses and vanpools	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Manage location of new growth to limit additional sprawl	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Mixed use development ordinance and zones	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Encourage or require complementary uses in close proximity in all developments or development areas	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Stop freeway bottleneck improvements that add lanes instead of focusing on transit	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Prohibit truck use of right lanes for loading on bus and bike routes	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Pedestrian mall route diversion	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Require two or more occupants per vehicle to enter designated congested activity centers during AM and PM peak traffic periods	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
More transit access near universities and airports	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Light rail	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Commuter rail	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
High-speed rail	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Encourage the use of jitneys (low-fare, flexible ride-share options)	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Encourage putting METRO and other public buses on propane or other lower polluting fuels	NO _x	On-Road	No	Must be considered through regional transportation planning process
Subsidize transit service	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Implement seamless public transit, connectivity	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Mandatory employer trip reduction programs for all employers with 20 or more employees	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • Must be considered through regional transportation planning process • Requires legislative action
Restrict student drivers to high schools	NO _x and VOC	On-Road	No	Requires legislative action
Engine software upgrade (DHF4) or low NO _x software upgrade	NO _x	On-Road	No	<ul style="list-style-type: none"> • TCEQ follows U.S. Environmental Protection Agency guidance • No new NO_x benefit
School bus idling Airborne Toxic Control Measure	NO _x	On-Road	No	Not quantifiable
Statewide emissions testing	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • Requires consent from counties • Requires legislative action
Centralized IM-240 test with repairs done separately	NO _x and VOC	On-Road	No	<ul style="list-style-type: none"> • Texas utilizes Onboard Diagnostic testing which is more effective than IM-240 testing • No new NO_x benefit
Raise the driving age	NO _x and VOC	On-Road	No	Requires legislative action
<i>Close loopholes in the Texas Clean Fleet Program making fewer exemptions for fleets—Tier 2 light-duty and 2007 heavy-duty vehicle emissions standards have superseded the original proposal</i>	NO _x	On-Road	No	Senate Bill 1032, 79th Texas Legislature, 2005, Regular Session, repealed the Texas Clean Fleet Program
Electric vehicles	NO _x and VOC	On-Road	No	Measure is being voluntarily implemented through MOAs in the region

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Cleaner diesel fuel - some diesel fuels have improved performance beyond TxLED	NO _x	On-Road	No	TxLED is required in the HGB area, and at this time, there are no approved fuels that are any cleaner than TxLED
Permit HOV lane use by qualifying low emission vehicles	NO _x	On-Road	No	Must be considered through regional transportation planning process
<i>Single occupant vehicle (SOV) access to HOV and transit stations—provide direct freeway access to adjoining HOV or transit park-and-ride facilities to encourage use and expedite access</i>	NO _x	On-Road	No	Must be considered through regional transportation planning process
<i>Managed lanes to accommodate some SOVs in HOV lanes—permit limited use of HOV lanes by SOVs using tolls or other limiting technique in highly congested corridors where speeds are below 20 miles per hour</i>	NO _x	On-Road	No	Must be considered through regional transportation planning process
Rewards for reporting smoking or high emitting vehicles	NO _x	On-Road	No	Not quantifiable/enforceable
<i>Enforce smoking vehicle reports and require repairs—require vehicle retesting</i>	NO _x	On-Road	No	<ul style="list-style-type: none"> • The LIRAP offers financial assistance to repair vehicles that fail the emissions test • Reductions do not advance attainment
Low-interest financing for low income and/or old vehicle trade-ins with financing made available to vehicle owners not eligible for LIRAP	NO _x and VOC	On-Road	No	Requires legislative action
Aggressive driving enforcement	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
<i>Incentive for infill and redevelopment—incentives for master planned communities planned around lower vehicle travel</i>	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Reduce transit fares	NO _x and VOC	On-Road	No	Not quantifiable/enforceable

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis				
Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Accelerate rail expansion	NO _x and VOC	On-Road	No	Must be considered through regional transportation planning process
Share hybrid vehicles	NO _x and VOC	On-Road	No	Not quantifiable/enforceable
Enhanced enforcement for Smoking Vehicle Program with vehicle impounding for violators	NO _x	On-Road	No	<ul style="list-style-type: none"> • The Local Initiative Projects (LIP) program provides funding to implement smoking vehicle programs in Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties • Reductions do not advance attainment
Inspection and Maintenance (I/M) in Chambers, Liberty, and Waller Counties	NO _x	On-Road	No	Requires local/legislative action
Idling Reduction	NO _x	On-Road	No	<ul style="list-style-type: none"> • Requires local enforcement of state idling limitations rules through a MOA with TCEQ • Not quantifiable
Disincentives such as fines if caught mowing during Ozone Alerts	VOC	Non-Road	No	<ul style="list-style-type: none"> • Modeling indicates general VOC reductions will not advance attainment • Not quantifiable/enforceable
Ban equipment such as two-stroke engines	VOC	Non-Road	No	<ul style="list-style-type: none"> • Modeling indicates general VOC reductions will not advance attainment • Not quantifiable/enforceable
Electrification of rail	NO _x	Non-Road	No	Not quantifiable/enforceable
Aircraft vapor recovery	VOC	Non-Road	No	Modeling indicates general VOC reductions will not advance attainment

Table G-2: HGB Area On-Road and Non-Road Mobile Sources RACM Analysis

Control Measure Description	Pollutant	On-Road or Non-Road	RACM	RACM Analysis
Use electric or cleaner technology auxiliary power units (APUs) for gate electrification	NO _x and VOC	Non-Road	No	Bush Intercontinental Airport and William P. Hobby Airport have already implement this technology on all gates
Use electric or cleaner technology APUs for preconditioned air	NO _x and VOC	Non-Road	No	Bush Intercontinental Airport and William P. Hobby Airport have already implement this technology on all gates
Use liquefied natural gas and compressed natural engines for locomotives	NO _x	Non-Road	No	<ul style="list-style-type: none"> • Locomotive engine standards exist in Federal Regulations • Federal regulatory action required for additional controls
Selective catalytic reduction for locomotives	NO _x	Non-Road	No	<ul style="list-style-type: none"> • Locomotive engine standards exist in federal regulations • Federal regulatory action required for additional controls
Marine TxLED in east and central Texas counties (currently only in HGB area)	NO _x	Non-Road	No	TxLED is required in the nonattainment area
Green Port Initiatives	NO _x and VOC	On-Road and Non-Road	No	Must be considered through regional transportation planning process
Texas Emissions Reduction Plan (TERP)	NO _x	On-Road and Non-Road	No	TERP has been implemented in the HGB area since 2001