

APPENDIX 1

**REASONABLE FURTHER PROGRESS DEMONSTRATION
SPREADSHEET**

Appendix 1 - Sheet 1

Houston-Galveston_Brazoria Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Reasonable Further Progress (RFP) Demonstration Calculation Spreadsheet

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2017 RFP Demonstration Analysis
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

2017 RFP Demonstration Analysis: To determine if the 2017 RFP requirements are met, the 2017 target level of emissions is compared to the 2017 controlled forecast inventory. The 2017 forecast inventory includes growth between the 2011 base year and the 2017 milestone year. The controlled forecast inventory has been reduced by subtracting the RFP control reductions between 2011 and 2017. If the 2017 controlled forecasted RFP emissions inventory (EI) is less than the 2017 RFP target level of emissions, then the 2017 RFP requirement is satisfied.

Line #	Description	NO _x (tpd)	VOC (tpd)
Line 1	Uncontrolled or existing controlled 2017 emissions forecast with growth	1018.21	829.50
Line 2	Creditable RFP control reductions, between 2011 and 2017	684.12	313.73
Line 3	Controlled 2017, RFP emissions forecast (Line 1 minus Line 2)	334.09	515.77
Line 4	Amount of NO _x reduction substitution (see Appendix 1, Sheet 3)	0.00	0.00
Line 5	Controlled 2017, RFP forecast accounting for NO _x substitution (Line 3 plus Line 4)	334.09	515.77
Line 6	2017 RFP target level of emissions	393.25	528.74
Line 7	Excess (+) / Shortfall (-) (Line 6 minus Line 5)	59.16	12.97
Line 8	Is controlled RFP EI less than target level of emissions?	Yes	Yes

Notes:

- 1) To calculate the RFP controlled forecast for each milestone/attainment year, the total RFP creditable control strategy reductions to date (total RFP reductions from 2011 to the current RFP milestone year) are subtracted from the total uncontrolled RFP EI.
- 2) To calculate the final excess or shortfall of for each milestone/attainment year, the controlled RFP emissions forecast is subtracted from the RFP target level of emissions. The RFP target level of emissions for all milestone years is calculated on the "Calc Targets" page.
- 3) Excess emissions reductions (Line 8) may be used to provide a transportation conformity safety margin. The safety margin must be less than or equal to the excess emissions reductions.

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Appendix 1 - Sheet 3

2017 RFP NO_x Substitution Analysis

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

The NO_x substitution calculation includes six steps. First, calculate the percent target reduction for both VOC and NO_x by comparing the base year and target inventories. Second, calculate the percent actual reduction by comparing the base year and the actual inventory. Third, compare the percent required reduction to the percent actual reduction. If the percent actual reduction is greater than the percent required, then there are surplus reductions. If the percent actual reduction is less than the percent target, then there is a shortfall of reductions. The difference between the percent actual and the percent target reduction (when there are surplus reductions) is the amount that is available for substitution. For the fourth step, determine the percent NO_x needed for substitution. The minimum base year VOC percentage needed is equal to the percent base year shortfall in VOC plus the smallest increment possible, or 0.01. The respective NO_x percent is calculated using the NO_x base year inventory. The percent base year NO_x transfer should not exceed the percent base year NO_x surplus. The percent NO_x available to transfer is based upon the base year because the base year is the basis for the required reduction calculations. Fifth, convert the percent base year NO_x to a percent target NO_x using the percent base year NO_x from step 5 and the relative values of the base year and target NO_x inventory. The percent NO_x transfer is derived from milestone year target values because those are the values modified by NO_x transfer. The percent NO_x transfer is a percentage of the milestone year target NO_x value that is added back into the NO_x inventory and a percentage of the milestone year target VOC that is subtracted from the VOC inventory. For the sixth step, calculate the resulting tons per day (tpd) associated with the percent NO_x transfer. For NO_x, multiply the NO_x percent transfer and the NO_x milestone year target value. For VOC, multiply the percent NO_x transfer (which is the same as the percentage of the milestone year target VOC that is subtracted from the VOC inventory) and the VOC milestone year target value. The NO_x transfer amount (in tpd) is added to the NO_x actual (in tpd) inventory in the RFP demonstration calculation, and the VOC transfer amount (in tpd) is subtracted from the VOC actual (in tpd) inventory.

Line #	Description	NO _x	VOC
Line 1	2011 base year emissions (tpd)	459.94	531.40
Line 2	2017 controlled RFP EI (tpd)	334.09	515.77
Line 3	Total actual reductions for 2011 to 2017 (Line 1 minus Line 2) (tpd)	125.85	15.63
Line 4	Percent actual reductions for 2011 to 2017 (percent Line 3 is of Line 1) (%)	27.36	2.94
Line 5	2017 target RFP EI (tpd)	393.25	528.74
Line 6	2017 total target reductions for 2011 to 2017 (Line 1 minus Line 5) (tpd)	66.69	2.66
Line 7	Percent target reductions for 2011 to 2017 (percent Line 6 is of Line 1) (%)	14.50	0.50
Line 8	Percent surplus or shortfall (percent actual minus percent target, Line 4 - Line 7) (%)	12.86	2.44
Line 9	Percent surplus to transfer (NO _x percentage should be less than Line 8) (%)	0.00	0.00
Line 10	Convert the percent surplus to transfer to tons per day (tpd)	0.00	Only NO _x Value Needed
Line 11	Calculate what percentage Line 10 is of target (this is the percentage to transfer) (%)	0.00	0.00
Line 12	Tons equivalent to percent for transfer [Line 5 times (Line 10 divided by 100)] (tpd)	0.00	0.00
Line 13	NO _x substitution amount okay? (Check to assure NO _x substitution does not exceed maximum available: Sheet 02, Line 9 must be greater than zero.)	Okay to Substitute	Okay to Substitute

Notes:

Line 7: The percent target reduction includes the 15% required reductions from 2011 through 2017, the 3% required reductions for each year after 2017, and accounts for noncreditable reductions between 2011 and the RFP milestone year; therefore, the total percent reduction may not be exactly 15 plus 3.

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2017 to 2018 RFP Contingency Demonstration for HGB

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Summary 2018 Contingency for 2017 RFP

Contingency Element Description	NO _x	VOC
HGB 2011 BY ¹ EI	459.94	531.40
Percent for contingency calculation (total of 3%)	2.00	1.00
2017 to 2018 required contingency reductions (BY¹ EI x (contingency percent))	9.20	5.31
Control reductions to meet contingency requirements		
Excess reductions from 2017 RFP demonstration	59.16	12.97
Subtract 2017 RFP demonstration motor vehicle emissions budget (MVEB) safety margin from excess reductions from 2017 RFP demonstration	-23.66	-11.67
Federal Motor Vehicle Control Program (FMVCP), inspection and maintenance (I/M), reformulated gasoline (RFG)/East Texas Regional Low RVP, 2017 Low Sulfur Gasoline Standard and on-road TxLED	24.35	8.78
Federal non-road mobile new vehicle certification standards, non-road RFG, and non-road TxLED	0.00	0.00
Total RFP demonstration contingency reductions	59.85	10.08
Contingency Excess (+) or Shortfall (-)	50.65	4.77

If changes are made to the enter reductions page, please assure the control reduction summary values above are consistent with the table below. The enter reductions page allows for the control reduction for a row to change. The table above adds particular rows from below.

Contingency Element Description	NO _x	VOC
HGB 2011 BY ¹ EI	459.94	531.40
Percent for contingency calculation (total of 3%)	2.00	1.00
2017 to 2018 8 HGB RFP required contingency reductions (BY¹ EI x (contingency percent))	9.20	5.31
Calculate available reductions to meet contingency requirements: add excess 2017 control reductions; subtract MVEB safety margin adjustment; and add each 2017 to 2018 control reduction		
Excess reductions from 2017 RFP demonstration	59.16	12.97
Subtract 2017 RFP MVEB safety margin from excess reductions from 2018 RFP demonstration	-23.66	-11.67
Chapter 117 NOX controls	0.00	0.00
Chapter 115 Storage Tank Rule	0.00	0.00
Coating / printing rules	0.00	0.00
Portable fuel containers	0.00	0.00
Chapter 117 NOX area source engine controls	0.00	0.00
Locomotive engine certification standards and fuel programs	0.00	0.00
Commercial marine vessel engine certification standards and fuel programs	0.00	0.00
Small non-road spark ignition (SI) engines (Phase I)	0.00	0.00
Heavy duty non-road engines	0.00	0.00
Tiers 2 and 3 non-road diesel engines	0.00	0.00
Small non-road SI engines (Phase II)	0.00	0.00
Large non-road SI & recreational marine	0.00	0.00
Non-road TxLED	0.00	0.00
Non-road RFG	0.00	0.00
Tier 4 non-road diesel engines	0.00	0.00
Diesel recreational marine	0.00	0.00
Small SI (Phase III)	0.00	0.00

Drilling rig Tier 2, 3, and 4 non-road diesel engines	0.00	0.00
Drilling rig low emission diesel	0.00	0.00
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	1.45	0.28
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	23.84	9.01
Inspection and Maintenance (I/M)	-0.94	-0.51
On-road TxLED	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
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This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
Total 2018 8 HGB RFP contingency reductions	59.85	10.08
Contingency Excess (+) or Shortfall (-)	50.65	4.77
Are contingency reductions equal to or greater than required contingency reduction?	Yes	Yes

Notes:

1) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. One result of removing the non-creditable reductions from the RFP calculations is the RFP adjusted base year inventory (ABY) becomes equal to the RFP base year inventory. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes."

2) The eight county HGB area includes counties all have federal RFG. None of the 8 counties has Texas Regional Low RVP.

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Appendix 1 - Sheet 5

2017 to 2018 AD Contingency Demonstration for HGB

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Summary 2018 Contingency for 2017 Attainment Demonstration

Contingency Element Description	NO_x	VOC
2011 HGB RFP base year ¹ (BY) emissions inventory (EI)	459.94	531.40
Percent for contingency calculation (total of 3%)	2.00	1.00
2017 to 2018 AD required contingency reductions (RFP BY¹ EI x (contingency percent))	9.20	5.31
Control reductions to meet contingency requirements		
Excess reductions from 2017 attainment demonstration	0.00	0.00
Subtract reductions reserved for 2017 attainment demonstration MVEB safety margin	0.00	0.00
Federal Motor Vehicle Control Program (FMVCP), inspection and maintenance (I/M), reformulated gasoline (RFG), 2017 Low Sulfur Gasoline Standard and on-road TxLED	24.35	8.78
Federal non-road mobile new vehicle certification standards, non-road RFG, and non-road TxLED	0.00	0.00
Total attainment demonstration contingency reductions	24.35	8.78
Contingency Excess (+) or Shortfall (-)	15.15	3.47

If changes are made to the enter reductions page please assure the control reduction summary values above are consistent with the table below. The enter reductions page allows for the control reduction for a row to change. The table above adds particular rows from below.

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Contingency Element Description	NO_x	VOC
2011 HGB BY ¹ EI	459.94	531.40
Percent for AD contingency calculation (total of 3%)	2.00	1.00
2017 to 2018 required AD contingency reductions (BY¹ EI x (contingency percent))	9.20	5.31
Control reductions to meet contingency requirements		
Add excess reductions from 2017 attainment demonstration	0.00	0.00
Subtract 2017 attainment demonstration MVEB safety margin	0.00	0.00
Chapter 117 NOX controls	0.00	0.00
Chapter 115 Storage Tank Rule	0.00	0.00
Coating / printing rules	0.00	0.00
Portable fuel containers	0.00	0.00
Chapter 117 NOX area source engine controls	0.00	0.00
Locomotive engine certification standards and fuel programs	0.00	0.00
Commercial marine vessel engine certification standards and fuel programs	0.00	0.00
Small non-road spark ignition (SI) engines (Phase I)	0.00	0.00
Heavy duty non-road engines	0.00	0.00
Tiers 2 and 3 non-road diesel engines	0.00	0.00
Small non-road SI engines (Phase II)	0.00	0.00
Large non-road SI & recreational marine	0.00	0.00
Non-road TxLED	0.00	0.00

Non-road RFG	0.00	0.00
Tier 4 non-road diesel engines	0.00	0.00
Diesel recreational marine	0.00	0.00
Small SI (Phase III)	0.00	0.00
Drilling rig Tier 2, 3, and 4 non-road diesel engines	0.00	0.00
Drilling rig low emission diesel	0.00	0.00
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	1.45	0.28
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	23.84	9.01
Inspection and Maintenance (I/M)	-0.94	-0.51
On-road TxLED	0.00	0.00
This row not used for current RFP	0.00	0.00
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This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
This row not used for current RFP	0.00	0.00
Total attainment demonstration contingency reductions	24.35	8.78
Contingency Excess (+) or Shortfall (-)	15.15	3.47

Notes:

1) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. One result of removing the non-creditable reductions from the RFP calculations is the RFP adjusted base year inventory (ABY) becomes equal to the RFP base year inventory. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes."

2) The eight county HGB area includes counties all have federal RFG. None of the 8 counties has Texas Regional Low RVP.

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Appendix 1 - Sheet 6

Calculations: 2017 RFP MVEBs

HGB Nonattainment Area Eight-Hour Ozone Season VOC and NOX (tons per day)

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Summary 2017 MVEB

Description	NO_x	VOC
2017 8 HGB on-road emissions projection without post-1990 FCAA controls	657.23	279.72
Total 2017 8 HGB on-road mobile source RFP control reductions	559.08	223.35
2017 8 HGB On-road mobile controlled inventory	98.15	56.37
Transportation conformity safety margin ¹	23.66	11.67
Excess emissions reduction for 2017	59.16	12.97
Is excess emissions enough for safety margin?	yes	yes
2017 8 HGB MVEB with safety margin	121.81	68.04

Note: If safety margin is > than excess emission reductions modify percent safety margin input on Sheet 10 "Enter % for RFP Cont & Conf SM"

Notes:

1) If there are excess RFP control reductions, a transportation conformity safety margin is allowed. The transportation conformity safety margin for this SIP revision is calculated based upon a percentage of excess emissions. Control of the safety margin options and calculation of the NOx and VOC values is done on Sheet 10 of this spreadsheet. If changes are needed for the Safety Margin, go to Sheet 10.

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Appendix 1 - Sheet 7

RFP Non-creditable Reductions Calculations

HGB Nonattainment Area Eight-Hour Ozone Season VOC and NO_x

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

8 hgb Calculation of Non-creditable NO_x and VOC Reductions

RFP Analysis Year	On-Road Mobile ABY EI NO _x	On-Road Mobile ABY EI VOC	Non-Creditable Fleet Turn Over Reductions NO _x	Non-Creditable Fleet Turn Over Reductions VOC	Non-Creditable Reduction Description
2011, 8 HGB	586.15	236.90	N/A	N/A	
2017, 8 HGB	583.63	240.14	2.52	-3.24	Pre-1990 CAA fleet turnover reduction baseline 2011 through 2017 for 9 PDC

Notes:

1) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. The non-creditable reductions are calculated above for use in the calculation of RFP Targets on Sheet 9. If the effects of non-creditable reductions are turned off on Sheet 10, the values above will remain unchanged however, zeros will automatically be substituted in the target calculations. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes" and the values above will automatically be used in the calculation of the RFP targets.

2) Non-creditable fleet turnover corrections: The reductions due to the the 1992 low RVP rule and the pre-1990 FMVCP are not creditable toward the RFP requirements. Both non-creditable rules only affect on-road mobile sources. The non-creditable reductions for each RFP milestone year are the difference between the on-road mobile ABY EI for each RFP milestone year and the on-road mobile 2011 RFP ABY EI. Since the pre-1990 FMVCP fleet turnover corrections are cumulative in the MOVES model, the noncreditable reductions from previous milestone years must be subtracted from the current milestone year to obtain the non-creditable reductions between milestone years. The FMVCP non-creditable reductions are used to calculate the target value for each RFP milestone year.

3) ABY inventories: The on-road mobile ABY inventories for each milestone/attainment year are calculated using 2011 vehicle miles traveled (VMT) and MOVES emission factors for each RFP analysis year with only the effects of pre-1990 FCAA controls turned on. The pre-1990 FCAA controls include the 1992 Reid Vapor Pressure control and the pre-1990 on-road mobile source FMVCP controls.

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Appendix 1 - Sheet 8

Quantify the Reductions to Meet the 15% RFP and the 3% RFP Contingency Emissions Reduction Requirements
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller/Wise County

The Initial 15%, the 3% per Year and Contingency Requirements: The FCAA mandates that an initial 15%, plus a 3% per year starting in year seven, VOC reduction, net of growth, occur from the baseline year 2011 through the attainment year. The reductions must be demonstrated for the six-year period from baseline 2011 through 2017, and every three years after 2017 through the attainment year, 2017. Since the attainment year and the first milestone year are the same year, the only requirement for this SIP update is 15% between 2011 and 2017. NOX may be substituted for VOC for the eight HGB counties, all previously designated nonattainment under both the one-hour and 1997 eight-hour standards. An additional 3% reduction must be demonstrated as a contingency measure for the one-year period following the attainment year, 2018. The division of the percent reductions between VOC and NOX are entered in the data entry sheet with tab name "Enter % for RFP Cont & Conf SM."

Calculation of Required 15% RFP and 3% RFP Contingency NO_x and VOC Reductions

RFP Analysis Year	Total Percent Reduction Requirement	Percent NO _x	Percent VOC	RFP ABY ¹ EI NO _x (tpd)	RFP ABY ¹ EI VOC (tpd)	Required Reductions NO _x (tpd)	Required Reductions VOC (tpd)
2011	N/A	N/A	N/A	459.94	531.40	N/A	N/A
2017	15.0	14.5	0.5	459.94	531.40	66.69	2.66
2018 Contingency	3.0	2.0	1.0	459.94	531.40	9.00	5.31

Notes:

1) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. One result of removing the non-creditable reductions from the RFP calculations is the RFP adjusted base year inventory (ABY) becomes equal to the RFP base year inventory. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes."

2) The ABY EI is the base year (BY) emissions minus the non-creditable on-road mobile reductions. It is calculated by adding the BY EI for point, area and non-road to the ABY for on-road. When the ABY EI is multiplied by the required percent reduction, the result is the reductions required.

3) On-road mobile ABY inventories: The on-road mobile ABY inventories for each milestone/attainment year are calculated using 2011 VMT and MOVES emission factors for each RFP analysis year with only the effects of pre-1990 FCAA controls turned on. The pre-1990 FCAA controls include the 1992 Reid Vapor Pressure control and the pre-1990 on-road mobile source FMVCP controls. The on-road mobile ABY EI is equal to the on-road mobile BY EI minus the non-creditable FMVCP reductions.

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Appendix 1 - Sheet 9

RFP Target Calculations: 2017 RFP Target Level of NO_x and VOC Emissions

HGB 2008 Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty,
Montgomery, Waller

Post-2011 target level of NO_x emissions: The NO_x target level is calculated by subtracting the reductions necessary to meet: the initial 15% from the baseline 2011 through 2017; the post-2017 3% per year; and the non-creditable fleet (FMVCP/RVP) reductions from the previous milestone/attainment year target level.

RFP Post-2011 8 HGB Target Level of NO_x Emissions				
RFP Milestone Year	Previous Target	FMVCP Non-creditable Reduction	Post-2011 Percent Reduction Requirement NO_x (tpd)	NO_x Target (tpd)
2011 Base Year, 8 HGB	N/A	N/A	N/A	459.94
2017, 8 HGB	459.94	0.00	66.69	393.25

Post-2011 target level of VOC emissions: The VOC target level is calculated by subtracting the reductions necessary to meet: the initial 15% from the baseline 2011 through 2017; the post-2017 3% per year; and the non-creditable fleet (FMVCP/RVP) reductions from the previous milestone/attainment year target level.

RFP Post-2011 8 HGB Target Level of VOC Emissions				
RFP Milestone Year	Previous Target	FMVCP Non-creditable Reduction	Post-2011 Percent Reduction Requirement VOC (tpd)	VOC Target (tpd)
2011 Base Year, 8 HGB	N/A	N/A	N/A	531.40
2017, 8 HGB	531.40	0.00	2.66	528.74

Notes:

1) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. The non-creditable reductions are calculated on Sheet 07 for use in the calculation of RFP Targets above. If the effects of non-creditable reductions are turned off on Sheet 10, the values for the non-creditable reductions will still be calculated on Sheet 07, however, zeros will automatically be substituted in the target calculations above. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes" and the value above will automatically be used in the calculation of the RFP targets.

2) A result of removing the non-creditable reductions from the RFP calculations is the RFP adjusted base year inventory (ABY) becomes equal to the RFP base year inventory. The ABY inventory is used to calculate the Post-2011 Percent Reductions used above. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes."

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Appendix 1 - Sheet 10

Enter RFP NO_x and VOC Percentage Reductions, Contingency Percents and Safety Margin

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

A 15% reduction is required for HGB for the period from the baseline year 2011 through 2017, the attainment year. For this HGB RFP, the reductions can be from NO_x or VOC. The percent of reductions that will be from NO_x should be input into the table below. Only a NO_x value needs to be input. The VOC percent will be calculated automatically based upon the total required percent minus the percent NO_x to be used.

RFP NO_x and VOC Percent Reductions for Milestone and Attainment Years			
RFP Milestone Year	NO _x %	VOC %	Total Percent
2017, 8 Nonattainment Counties	14.5	0.5	15

A total of 3% RFP contingency measures reductions are required between 2017 to 2018. A 3% contingency is also required for the attainment demonstration for 2017 to 2018. The contingency reductions can be from NO_x or VOC. Input only the percent of the contingency reductions that will be from NO_x. The VOC value will be calculated automatically as 3 minus the NO_x percent.

RFP and Attainment Demonstration NO_x and VOC Percent Reductions for 2018 Contingency			
Contingency Year	NO _x %	VOC %	Total Percent
RFP 2017 to 2018	2	1	3
AD 2017 to 2018	2	1	3

If there are excess RFP control reductions, a transportation conformity safety margin is allowed. The safety margin for this SIP revision is calculated based upon a percentage of excess emissions. If a safety margin will be used, enter the percentage of excess VOC and NO_x emissions to be used below. The safety margin amount must be less than or equal to the excess reductions after demonstrating RFP. The percentage entered must be between 0 and 100. An error message will appear if a value over 100 is entered. Adjusting the safety margin below will automatically update the MVEB calculation to include the percent of excess emissions entered. For reference, the corresponding percent of the MVEB and tons per day are provided.

RFP Milestone Year	Pollutant	Conformity Safety Margin % of Excess RFP Reductions	Percent of On-road EI (For Reference)	Tons Per Day Change to On-road EI (For Reference)
2017	NO _x	40	24.11	23.66
2017	VOC	90	20.70	11.67

The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the *Federal Register* (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. The Federal Clean Air Act (FCAA) §182(b)(1)(D) specifies four categories of control measures that are not creditable toward the 15% RFP requirement under FCAA §182(b)(1)(A). The EPA stated that for three of the categories, reductions from the measures were achieved many years ago, so the question of creditability is moot for RFP credits for the 2008 eight-hour ozone standard. For the one remaining category, measures related to motor vehicle exhaust or evaporative emissions promulgated by January 1, 1990, citing an assessment that at this point in history the ongoing emission reductions from pre-1990 control measures in this category are *de minimis*, the EPA finalized an approach that eliminates any obligation for states to continue to perform emission reduction calculations for the pre-1990 control measures listed under FCAA §182(b)(1)(D)(i). The "Yes/No" drop-down list in the table below allows non-creditable emission reductions to be turned on or off for this SIP revision. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle can be set to "Yes."

Non-creditable Calculation	Include for NO _x Target	Include for VOC Target
2017	No	No

Enter the percent of the NO_x milestone year target that will be transferred to VOC. Only the NO_x percent is entered. The VOC percent is automatically equal to the NO_x percent transfer. These vales are used on Sheets 03 and 06 in the NO_x transfer calculations.

NO_x Substitution	Percent of NO_x Reductions to Transfer to Percent VOC Reductions	Percent of VOC Reductions Transferred from Percent NO_x Reductions
2017	0.00	0.00

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Appendix 1 - Sheet 11

Enter Airport Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	6.62	6.62	0.000	0.00	2.17	2.17	0.000	0.00
2017	6.86	6.86	0.000	0.00	2.25	2.25	0.000	0.00

Notes:

- 1) The airport emissions inventory includes emissions from: aircraft; aircraft auxiliary power units (APU); and, airport ground support equipment (GSE).

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Appendix 1 - Sheet 12

Enter Area Source Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Existing Controlled Emissions (as of 2011) NO _x (tpd)	Post-2011 Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Existing Controlled Emissions (as of 2011) VOC (tpd)	Post-2011 Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	21.15	21.15	0.000	0.0	304.90	304.90	0.000	0.0
2017	24.30	24.30	0.000	0.0	313.53	313.53	0.000	0.0

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Appendix 1 - Sheet 13

Enter Biogenic Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	See Note 1	N/A	N/A	N/A	See Note 1	N/A	N/A	N/A

Notes:

1) Beginning with the Air Emissions Reporting Requirements (December 2008), the emissions required to be reported no longer include emissions from biogenic sources. Therefore, as of the 2011 reporting year, the comprehensive triennial emissions inventory no longer includes emissions from biogenic sources. The RFP demonstrations are based upon the emissions from anthropogenic sources. The guidance for RFP calculations shows the first step is to subtract the emissions from biogenic sources from the total base year emissions to obtain the total anthropogenic emission inventory. As of 2011, under the AERR, the base year emissions do not include biogenic sources and already represent the total anthropogenic emissions. In this case, step one of the RFP process is not needed, and the emissions from biogenic sources is unnecessary. This RFP SIP revision: uses a base year of 2011; does not require subtraction of the biogenic emissions in Step One of the RFP calculation process; and does not include quantification of emissions from biogenic sources.

2) 8 HGB means the eight nonattainment counties and indicates values are for the eight counties that had an existing designation under the one-hour ozone standard and under the 1997 eight-hour ozone standard. Includes: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties.

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Appendix 1 - Sheet 14

Enter Commercial Marine Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	68.95	61.61	7.340	10.6	1.59	1.59	0.000	0.0
2017	38.16	28.77	9.390	24.6	1.21	1.15	0.060	5.0

Notes:

1) The uncontrolled emissions for CMV (both NO_x and VOC) both showed decreases from 2011 to 2017 due to decreases in activity, including dredging, and emissions factors.

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Appendix 1 - Sheet 15

Enter Oil and Gas Production, Drilling Rigs, Diesel Engines Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	1.01	0.44	0.570	56.4	0.16	0.04	0.120	75.0
2017	1.29	0.57	0.720	55.8	0.21	0.05	0.160	76.2

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Appendix 1 - Sheet 16

Enter Locomotive Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	32.51	18.20	14.310	44.0	1.35	1.09	0.260	19.3
2017	33.11	14.70	18.410	55.6	1.38	0.73	0.650	47.1

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Appendix 1 - Sheet 17

Enter NONROAD Categories Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	107.37	55.57	51.800	48.2	107.27	44.89	62.380	58.2
2017	130.84	36.07	94.770	72.4	118.16	29.40	88.760	75.1

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Appendix 1 - Sheet 18

Enter On-road Mobile Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	586.15	188.02	398.130	67.9	236.90	80.73	156.170	65.9
2017	657.23	98.15	559.080	85.1	279.72	56.37	223.350	79.8

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Appendix 1 - Sheet 19

Enter ABY On-Road Mobile Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

**Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend,
Galveston, Harris, Liberty, Montgomery, Waller**

RFP Analysis Year	ABY NO _x (tpd)	ABY VOC (tpd)
2011	586.15	236.90
2017	583.63	240.14

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Appendix 1 - Sheet 20

Enter Point Source Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Existing Controlled Emissions (as of 2011) NO _x (tpd)	Post-2011 Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Existing Controlled Emissions (as of 2011) VOC (tpd)	Post-2011 Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
2011	108.33	108.33	0.000	0.0	95.99	95.99	0.000	0.0
2017	126.42	126.42	0.000	0.0	113.04	113.04	0.000	0.0

Notes:

- 1) The difference between existing post-2011 Controlled emissions (as of 2011) and Post-2011 Controlled VOC emissions represents noncreditable as well as creditable reductions.

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Appendix 1 - Sheet 21

Enter 2017 Control Measure Reductions

HGB Nonattainment Area Eight-hour Ozone Season VOC and NOx

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

RFP Control Strategy Description	Source Category	Total 2011 to 2017 NO _x Emissions Reductions (tpd)	Total 2011 to 2017 VOC Emissions Reductions (tpd)	Use this control for RFP calculations? (Yes or No)	Is this an on-road mobile control that will change the MVEB? (Yes or No)
Chapter 117 NO _x controls	Point	0.00	0.00	Yes	No
Chapter 115 Storage Tank Rule	Point	0.00	0.00	Yes	No
Coating / printing rules	Point	0.00	0.00	Yes	No
Portable fuel containers	Area	0.00	0.00	Yes	No
Chapter 117 NO _x area source engine controls	Area	0.00	0.00	Yes	No
Locomotive engine certification standards and fuel programs	NR	18.41	0.65	Yes	No
Commercial marine vessel engine certification standards and fuel p	NR	9.39	0.06	Yes	No
Small non-road spark ignition (SI) engines (Phase I)	NR	-3.10	24.29	Yes	No
Heavy duty non-road engines	NR	21.54	11.26	Yes	No
Tiers 2 and 3 non-road diesel engines	NR	27.33	3.95	Yes	No
Small non-road SI engines (Phase II)	NR	2.17	22.48	Yes	No
Large non-road SI & recreational marine	NR	33.49	13.71	Yes	No
Non-road TxLED	NR	1.74	0.00	Yes	No
Non-road RFG	NR	0.03	0.08	Yes	No
Tier 4 non-road diesel engines	NR	11.41	0.59	Yes	No
Diesel recreational marine	NR	0.00	0.01	Yes	No
Small SI (Phase III)	NR	1.91	13.14	Yes	No
Drilling rig Tier 2, 3, and 4 non-road diesel engines	NR	0.68	0.15	Yes	No
Drilling rig low emission diesel	NR	0.04	0.01	Yes	No
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	OR	85.13	16.87	Yes	Yes
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	OR	464.25	198.54	Yes	Yes
Inspection and Maintenance (I/M)	OR	6.89	7.94	Yes	Yes
On-road TxLED	OR	2.81	0.00	Yes	Yes
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
Total		684.12	313.73		

Notes:

- 1) Point source Chapter 117 NO_x controls in the HGB area had compliance deadlines before 2011. The 2011 EI includes the effects of the control. No additional control beyond 2011 are claimed.
- 2) Area source Chapter 117 NO_x controls in the HGB area had compliance deadlines before 2011. The 2011 EI includes the effects of the control. No additional control beyond 2011 are claimed.
- 3) Area source Portable fuel containers controls in the HGB area had compliance deadlines before 2011. The 2011 EI includes the effects of the control. No additional control beyond 2011 are claimed.
- 4) All eight counties in the HGB area are covered by the federal RFG requirement.
- 5) Inspection and Maintenance Program is only modeled for the five counties covered by the program: The five I/M counties include: Brazoria, Fort Bend, Galveston, Harris, and Montgomery. To correct for rounding error, the I/M program reduction is set to 7.94, report lists 7.93.
- 6) "This row not used for current RFP" control rows were created only to allow for planners to easily add controls for alternative scenario analyses.

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Appendix 1 - Sheet 22

Enter 2019 Contingency Measure Control Measure Reductions
HGB Nonattainment Area Eight-Hour Ozone Season VOC and NOX
Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

RFP Control Strategy Description	Source Category	Total 2011 to 2018 NO _x Emissions Reductions (tpd)	Total 2011 to 2018 VOC Emissions Reductions (tpd)	Use this control for 2018 RFP contingency? (Yes or No)
Chapter 117 NOX controls	Point	0.00	0.00	No
Chapter 115 Storage Tank Rule	Point	0.00	0.00	No
Coating / printing rules	Point	0.00	0.00	No
Portable fuel containers	Area	0.00	0.00	No
Chapter 117 NOX area source engine controls	Area	0.00	0.00	No
Locomotive engine certification standards and fuel programs	NR	0.00	0.00	No
Commercial marine vessel engine certification standards and fu	NR	0.00	0.00	No
Small non-road spark ignition (SI) engines (Phase I)	NR	-3.15	24.70	No
Heavy duty non-road engines	NR	21.97	11.55	No
Tiers 2 and 3 non-road diesel engines	NR	28.37	4.09	No
Small non-road SI engines (Phase II)	NR	11.42	-3.05	No
Large non-road SI & recreational marine	NR	34.97	14.57	No
Non-road TxLED	NR	1.59	0.00	No
Non-road RFG	NR	0.02	0.09	No
Tier 4 non-road diesel engines	NR	13.27	0.66	No
Diesel recreational marine	NR	0.00	0.00	No
Small SI (Phase III)	NR	2.03	13.97	No
Drilling rig Tier 2, 3, and 4 non-road diesel engines	NR	0.67	0.14	No
Drilling rig low emission diesel	NR	0.04	0.01	No
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	OR	86.58	17.15	Yes
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	OR	488.09	207.55	Yes
Inspection and Maintenance (I/M)	OR	5.95	7.43	Yes
On-road TxLED	OR	2.50	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
This row not used for current RFP	N/A	0.00	0.00	No
Total		694.32	298.86	

Notes

1) "This row not used for current RFP" control rows were created only to allow for planners to easily add controls for alternative scenario analyses.

2) Please see other notes for the control reductions on:

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Appendix 1 - Sheet 23

Calculate 2011 RFP Base Year Emissions Inventory
(Add emissions from outside the nonattainment area that are to be included in the RFP analysis.)

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

The 8 NAC 2011 Base Year Inventory	NO_x (tons/day)	VOC (tons/day)
Point Source 2011 EI	108.33	95.99
Area Source 2011 EI	21.15	304.90
On-road Mobile Source 2011 EI	188.02	80.73
Non-road Mobile Source 2011 EI	142.44	49.78
Biogenic 2011 EI (see Note 1)	See Note 1	See Note 1
Total 2011 Base Year Inventory	459.94	531.40
The 2011 RFP Base Year Inventory Out of Area Adjustments	NO_x (tons/day)	VOC (tons/day)
What is the total amount of biogenic emissions from sources in the area in tons/day for 2011 to be subtracted?	See Note 1	See Note 1
What is the total amount of point source emissions from outside the nonattainment to be included/excluded for 2011?	0.00	0.00
What is the total amount of area source emissions from outside the nonattainment to be included/excluded for 2011?	0.00	0.00
What is the total amount of on-road source emissions from outside the nonattainment to be included/excluded for 2011?	0.00	0.00
What is the total amount of non-road source emissions from outside the nonattainment to be included/excluded for 2011?	0.00	0.00
Total 2011 RFP Base Year Adjustments	0.00	0.00
Description	NO_x (tons/day)	VOC (tons/day)
Total 2011 RFP Base Year Inventory with Adjustments	459.94	531.40

Notes:

- 1) Beginning with the Air Emissions Reporting Requirements (December 2008), the emissions required to be reported no longer include emissions from biogenic sources. Therefore, as of the 2011 reporting year, the comprehensive triennial emissions inventory no longer includes emissions from biogenic sources. The RFP demonstrations are based upon the emissions from anthropogenic sources. The guidance for RFP calculations shows the first step is to subtract the emissions from biogenic sources from the total base year emissions to obtain the total anthropogenic emission inventory. As of 2011, under the AERR, the base year emissions do not include biogenic sources and already represent the total anthropogenic emissions. In this case, step one of the RFP process is not needed, and the emissions from biogenic sources is unnecessary. This RFP SIP revision: uses a base year of 2011; does not require subtraction of the biogenic emissions in Step One of the RFP calculation process; and does not include quantification of emissions from biogenic sources.
- 2) Input lines allow for input of emissions from outside the subject counties to be included in the calculation of the RFP BY emissions. Emission reductions from the included sources can then be used to meet RFP requirements.
- 3) Values in lines should be input as positive values for emissions from outside the area that need to be included in the calculations and as negative values for emissions which need to be excluded from the RFP calculations.

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Appendix 1 - Sheet 24

2017 Forecasted Uncontrolled or Existing Control Emissions Inventory with pre-2011 Controls

HGB Nonattainment Area Eight-Hour Ozone Season VOC and NO_x

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Uncontrolled or Existing Control EI with pre-2011 controls: These calculations sum the total Uncontrolled or Existing Control NO_x and VOC emissions (tpd) for the 2017 RFP milestone year. The totals for each source category used in these calculations were entered on enter EI sheets.

Forecasted 2017 Uncontrolled or Existing Control Emissions Inventory with pre-2011 Controls		
Emissions Description	NO _x (tpd)	VOC (tpd)
Point Source	126.42	113.04
Area Source	24.30	313.53
On-Road Mobile Source	657.23	279.72
Non-Road Mobile Source	210.26	123.21
Eight County Total	1018.21	829.50

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Appendix 1 - Sheet 25

Calculations: 2011 Adjusted Base Year Emissions Inventory with Pre-1990 Controls
HGB Nonattainment Area Eight-Hour Ozone Season VOC and NOX

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

2011 RFP Adjusted Base Year Emissions Inventory with Pre-1990 Controls		
Emissions Description	NO _x (tpd)	VOC (tpd)
Point Source 2011 BY EI	108.33	95.99
Area Source 2011 BY EI	21.15	304.90
On-Road Mobile Source 2011 ABY EI	188.02	80.73
Non-Road Mobile Source 2011 BY EI	142.44	49.78
2011 RFP Adjusted Base Year Emissions Inventory	459.94	531.40

Notes:

1) ABY EI with pre-1990 controls: This table calculates the 2011 RFP ABY NO_x and VOC emissions (tpd). The totals for each source category used in these calculations were entered on enter EI sheets. For on-road mobile sources, there are separate data entry sheets for the ABY inventory for each milestone year (see Note 2 for how the on-road ABY EI values are used for this SIP revision). For all other source categories, the 2011 ABY is equal to the 2011 BY because there are no non-creditable controls for point, area or non-road sources for this SIP revision.

2) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. One result of removing the non-creditable reductions from the RFP calculations is the RFP adjusted base year inventory (ABY) becomes equal to the RFP base year inventory. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. The calculation of the ABY EI in the tables above is automatically updated to be consistent with the non-creditable toggle. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes."

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Appendix 1 - Sheet 26

Calculations: 2017 Adjusted Base Year Emissions Inventory with Pre-1990 Controls
HGB Nonattainment Area Eight-Hour Ozone Season VOC and NOX

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

2017 RFP Adjusted Base Year Emissions Inventory with Pre-1990 Controls		
Emissions Description	NO _x (tpd)	VOC (tpd)
Point Source 2011 BY EI	108.33	95.99
Area Source 2011 BY EI	21.15	304.90
On-Road Mobile Source 2017 ABY EI	188.02	80.73
Non-Road Mobile Source 2011 BY EI	142.44	49.78
2017 RFP Adjusted Base Year Emissions Inventory	459.94	531.40

Notes:

1) ABY EI with pre-1990 controls: This table calculates the 2017 RFP ABY NO_x and VOC emissions (tpd). The totals for each source category used in these calculations were entered on enter EI sheets. For on-road mobile sources, there are separate data entry sheets for the ABY inventory for each milestone year (see Note 2 for how the on-road ABY EI values are used for this SIP revision). For all other source categories, the 2017 ABY is equal to the 2011 BY because there are no non-creditable controls for point, area or non-road sources for this SIP revision.

2) The EPA published the final implementation rule for the 2008 ozone NAAQS (SIP requirements rule) in the Federal Register (FR) on March 6, 2015 (80 FR 12263). The final rule removed the requirement for states to account for non-creditable reductions when determining compliance with Reasonable Further Progress (RFP) emission reduction requirements. One result of removing the non-creditable reductions from the RFP calculations is the RFP adjusted base year inventory (ABY) becomes equal to the RFP base year inventory. There is a toggle on Sheet 10 of this spreadsheet to turn the effects of non-creditable reductions either off or on. The default toggle is "No," which turns off the calculated effects of pre-1990 control measures. The calculation of the ABY EI in the tables above is automatically updated to be consistent with the non-creditable toggle. Should there be a need to perform the RFP calculations accounting for the effects of pre-1990 control reductions, the toggle on Sheet 10 can be set to "Yes."

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Appendix 1 - Sheet 27

Calculations: 2011 to 2017 Control Measures Reductions

HGB Nonattainment Area Eight-Hour Ozone Season VOC and NOX

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Explanation: The control strategy name, control reduction amount, status of inclusion of the control in the RFP calculations, and whether or not the control is for on-road mobile sources were all input in sheet "21 Enter Reductions 2017." The reduction is the amount that is creditable from each control between 2011 and 2017. If the control has been turned off by inputting a "No" in the "Use this control for RFP demonstration?" column, the spreadsheet will put a zero in for the reduction for that control on this sheet, even if a positive value for the control was input into the "21 Enter Reductions 2017" sheet. If it was intended to have a positive reduction for the control but there is a zero, go back to the "21 Enter Reductions 2017" Sheet and change the No to a Yes indicating that the control will be used for RFP demonstration.

RFP Control Strategy Description	Source Category	Total 2011 to 2017 NOX Emissions Reductions (tpd)	Total 2011 to 2017 VOC Emissions Reductions (tpd)	Use this control for RFP demonstration? (Yes or No)	Is this an on-road mobile control that will change the MVEB? (Yes or No)
Chapter 117 NOX controls	Point	0.00	0.00	Yes	No
Chapter 115 Storage Tank Rule	Point	0.00	0.00	Yes	No
Coating / printing rules	Point	0.00	0.00	Yes	No
Portable fuel containers	Area	0.00	0.00	Yes	No
Chapter 117 NOX area source engine controls	Area	0.00	0.00	Yes	No
Locomotive engine certification standards and fuel programs	NR	18.41	0.65	Yes	No
Commercial marine vessel engine certification standards and fue	NR	9.39	0.06	Yes	No
Small non-road spark ignition (SI) engines (Phase I)	NR	-3.10	24.29	Yes	No
Heavy duty non-road engines	NR	21.54	11.26	Yes	No
Tiers 2 and 3 non-road diesel engines	NR	27.33	3.95	Yes	No
Small non-road SI engines (Phase II)	NR	2.17	22.48	Yes	No
Large non-road SI & recreational marine	NR	33.49	13.71	Yes	No
Non-road TxLED	NR	1.74	0.00	Yes	No
Non-road RFG	NR	0.03	0.08	Yes	No
Tier 4 non-road diesel engines	NR	11.41	0.59	Yes	No
Diesel recreational marine	NR	0.00	0.01	Yes	No
Small SI (Phase III)	NR	1.91	13.14	Yes	No
Drilling rig Tier 2, 3, and 4 non-road diesel engines	NR	0.68	0.15	Yes	No
Drilling rig low emission diesel	NR	0.04	0.01	Yes	No
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	OR	85.13	16.87	Yes	Yes
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	OR	464.25	198.54	Yes	Yes
Inspection and Maintenance (I/M)	OR	6.89	7.94	Yes	Yes
On-road TxLED	OR	2.81	0.00	Yes	Yes
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
This row not used for current RFP	N/A	0.00	0.00	No	No
Total 2017 RFP Control Reductions		684.12	313.73		

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Appendix 1 - Sheet 29

Calculations: 2011 to 2017 On-road Control Measures Reductions

HGB Nonattainment Area Eight-Hour Ozone Season VOC and NOX

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Creditable Reductions Control Strategy	Control Used for RFP Demonstration?	On-road Mobile Source Control?	Total 2011 - 2017 'On-road Mobile NO _x Emissions Reductions (tpd)	Total 2011 - 2017 'On-road Mobile VOC Emissions Reductions (tpd)
Chapter 117 NOX controls	Yes	No	0	0
Chapter 115 Storage Tank Rule	Yes	No	0	0
Coating / printing rules	Yes	No	0	0
Portable fuel containers	Yes	No	0.00	0.00
Chapter 117 NOX area source engine controls	Yes	No	0	0
Locomotive engine certification standards and fuel programs	Yes	No	0	0
Commercial marine vessel engine certification standards and fuel prog	Yes	No	0	0
Small non-road spark ignition (SI) engines (Phase I)	Yes	No	0	0
Heavy duty non-road engines	Yes	No	0	0
Tiers 2 and 3 non-road diesel engines	Yes	No	0	0
Small non-road SI engines (Phase II)	Yes	No	0	0
Large non-road SI & recreational marine	Yes	No	0	0
Non-road TxLED	Yes	No	0	0
Non-road RFG	Yes	No	0	0
Tier 4 non-road diesel engines	Yes	No	0	0
Diesel recreational marine	Yes	No	0	0
Small SI (Phase III)	Yes	No	0	0
Drilling rig Tier 2, 3, and 4 non-road diesel engines	Yes	No	0	0
Drilling rig low emission diesel	Yes	No	0	0
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	Yes	Yes	85.13	16.87
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	Yes	Yes	464.25	198.54
Inspection and Maintenance (I/M)	Yes	Yes	6.89	7.94
On-road TxLED	Yes	Yes	2.81	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
This row not used for current RFP	No	No	0	0
Total 2017 On-road Mobile Source RFP Control Reductions			559.08	223.35

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Appendix 1 - Sheet 30

Summary Sheet: Uncontrolled or Existing Control NOx Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area
Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris,
Liberty, Montgomery, Waller

2011 Uncontrolled or Existing Control NOx (tons per day)

Source Category	2011 Uncontrolled or Existing Control NOx (tons per day)
Area Sources	21.15
Non-Road Mobile Sources	216.46
On-Road Mobile Sources	586.15
Point Sources	108.33
Total	932.09

2017 Uncontrolled or Existing Control NOx (tons per day)

Source Category	2017 Uncontrolled or Existing Control NOx (tons per day)
Area Sources	24.30
Non-Road Mobile Sources	210.26
On-Road Mobile Sources	657.23
Point Sources	126.42
Total	1,018.21

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Appendix 1 - Sheet 31

Summary Sheet: Controlled or Post-2011 Controlled NOx Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area
Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris,
Liberty, Montgomery, Waller

Controlled or Post-2011 Controlled NOX for 2011 (tons per day)

Source Category	2011 Controlled or Post-2011 Controlled NOx (tons per day)
Area Sources	21.15
Non-Road Mobile Sources	142.44
On-Road Mobile Sources	188.02
Point Sources	108.33
Total	459.94

Controlled or Post-2011 Controlled NOX for 2017 (tons per day)

Source Category	2017 Controlled or Post-2011 Controlled NOx (tons per day)
Area Sources	24.30
Non-Road Mobile Sources	86.97
On-Road Mobile Sources	98.15
Point Sources	126.42
Total	335.84

Note: The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.

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Appendix 1 - Sheet 32

Summary Sheet: Uncontrolled or Existing Control VOC Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area
Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty,
Montgomery, Waller

2011 Uncontrolled or Existing Control VOC (tons per day)

Source Category	2011 Uncontrolled or Existing Control VOC (tons per day)
Area Sources	304.90
Non-Road Mobile Sources	112.54
On-Road Mobile Sources	236.90
Point Sources	95.99
Total	750.33

2017 Uncontrolled or Existing Control VOC (tons per day)

Source Category	2017 Uncontrolled or Existing Control VOC (tons per day)
Area Sources	313.53
Non-Road Mobile Sources	123.21
On-Road Mobile Sources	279.72
Point Sources	113.04
Total	829.50

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Appendix 1 - Sheet 33

Summary Sheet: Controlled or Post-2011 Controlled VOC Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area
Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris,
Liberty, Montgomery, Waller

Controlled or Post-2011 Controlled VOC for 2011 (tons per day)

Source Category	2011 Controlled or Post-2011 Controlled VOC (tons per day)
Area Sources	304.90
Non-Road Mobile Sources	49.78
On-Road Mobile Sources	80.73
Point Sources	95.99
Total	531.40

Controlled or Post-2011 Controlled VOC for 2017 (tons per day)

Source Category	2017 Controlled or Post-2011 Controlled VOC (tons per day)
Area Sources	313.53
Non-Road Mobile Sources	33.58
On-Road Mobile Sources	56.37
Point Sources	113.04
Total	516.52

Note: The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.

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Appendix 1 - Sheet 34

Summary Sheet: 2011 Emissions Inventory By Category

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

HGB 2011 Emissions (tons per day)

Emissions Inventory Source	Uncontrolled or Existing Control NOx	Controlled or Post-2011 Controlled NOx	Uncontrolled or Existing Control VOC	Controlled or Post-2011 Controlled VOC
Area Sources	21.15	21.15	304.90	304.90
Non-Road Mobile Sources	216.46	142.44	112.54	49.78
On-Road Mobile Sources	586.15	188.02	236.90	80.73
Point Sources	108.33	108.33	95.99	95.99
Total	932.09	459.94	750.33	531.40

Note: The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.

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Appendix 1 - Sheet 35

Summary Sheet: 2017 Emissions Inventory By Category

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

HGB 2017 Emissions (tons per day)

Emissions Inventory Source	Uncontrolled or Existing Control NOx	Controlled or Post-2011 Controlled NOx	Uncontrolled or Existing Control VOC	Controlled or Post-2011 Controlled VOC
Area Sources	24.30	24.30	313.53	313.53
Non-Road Mobile Sources	210.26	86.97	123.21	33.58
On-Road Mobile Sources	657.23	98.15	279.72	56.37
Point Sources	126.42	126.42	113.04	113.04
Total	1018.21	335.84	829.50	516.52

Note: The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.

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Appendix 1 - Sheet 36

Summary Total Non-Road Emissions Inventory
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

'RFP Analysis Year	Uncontrolled NO _x (tpd)	Controlled NO _x (tpd)	Total Reduction NO _x (tpd)	Percent Reduction	Uncontrolled VOC (tpd)	Controlled VOC (tpd)	Total Reduction VOC (tpd)	Percent Reduction
8 HGB 2011	216.46	142.44	74.02	34.20	112.54	49.78	62.76	55.77
8 HGB 2017	210.26	86.97	123.29	58.64	123.21	33.58	89.63	72.75

Notes:

- 1) The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.
- 2) The non-road emissions inventory includes emissions from: airports; locomotives; commercial marine; NONROAD Model categories; and drilling rigs.
- 3) The airport emissions inventory includes emissions from: aircraft; aircraft auxiliary power units (APU); and, airport ground support equipment (GSE).

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Appendix 1 - Sheet 37

Summary Sheet: 2011 Non-Road Summary by Category

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

2011 HGB Non-road Emissions (tons per day)

Emissions Inventory Source	Uncontrolled NOx	Controlled NOx	Uncontrolled VOC	Controlled VOC
Airport	6.62	6.62	2.17	2.17
Locomotive	32.51	18.20	1.35	1.09
Commercial Marine	68.95	61.61	1.59	1.59
NONROAD Model	107.37	55.57	107.27	44.89
Drilling Rigs	1.01	0.44	0.16	0.04
Total All	216.46	142.44	112.54	49.78
Total ALM	108.08	86.43	5.11	4.85
ALM Plus Drilling Rigs (Off-road)	109.09	86.87	5.27	4.89

Notes:

- 1) The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.
- 2) The non-road emissions inventory includes emissions from: airports; locomotives; commercial marine; NONROAD Model categories; and drilling rigs.
- 3) The airport emissions inventory includes emissions from: aircraft; aircraft auxiliary power units (APU); and, airport ground support equipment (GSE).

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Summary Sheet: 2017 Non-Road Summary by Category

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

2017 HGB Non-road Emissions (tons per day)

Emissions Inventory Source	Uncontrolled NOx	Controlled NOx	Uncontrolled VOC	Controlled VOC
Airport	6.86	6.86	2.25	2.25
Locomotive	33.11	14.70	1.38	0.73
Commercial Marine	38.16	28.77	1.21	1.15
NONROAD Model	130.84	36.07	118.16	29.40
Drilling Rigs	1.29	0.57	0.21	0.05
Total All	210.26	86.97	123.21	33.58
Total ALM	78.13	50.33	4.84	4.13
ALM Plus Drilling Rigs (Off-road)	79.42	50.90	5.05	4.18

Notes:

- 1) The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.
- 2) The non-road emissions inventory includes emissions from: airports; locomotives; commercial marine; NONROAD Model categories; and drilling rigs.
- 3) The airport emissions inventory includes emissions from: aircraft; aircraft auxiliary power units (APU); and, airport ground support equipment (GSE).

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Appendix 1 - Sheet 39

Summary Sheet: 2011 Emissions Inventory By Category

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Table 2 13: HGB Eight-County RFP Summary of the 2011 Base Year Average Summer Weekday NO_x and VOC Emissions (tons per day)

Emissions Inventory Source	Uncontrolled NO_x	Controlled NO_x	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	216.46	142.44	112.54	49.78
On-Road Mobile Sources	586.15	188.02	236.90	80.73
Emissions Inventory Source	Existing Controlled NO_x (as of 2011)	Post-2011 Controlled NO_x	Uncontrolled VOC	Post-2011 Controlled VOC
Area Sources	21.15	21.15	304.90	304.90
Point Sources	108.33	108.33	95.99	95.99
Total	932.09	459.94	750.33	531.40

Note: The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.

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Summary Sheet: 2017 Emissions Inventory By Category

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Table 2 14: HGB Eight-County RFP Summary of the 2017 Average Summer Weekday NO_x and VOC Emissions (tons per day)

Emissions Inventory Source	Uncontrolled NO_x	Controlled NO_x	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	210.26	86.97	123.21	33.58
On-Road Mobile Sources	657.23	98.15	279.72	56.37
Emissions Inventory Source	Existing Controlled NO_x (as of 2011)	Post-2011 Controlled NO_x	Uncontrolled VOC	Post-2011 Controlled VOC
Area Sources	24.30	24.30	313.53	313.53
Point Sources	126.42	126.42	113.04	113.04
Total	1018.21	335.84	829.50	516.52

Note: The controlled inventory shown here includes all controls. The controlled RFP inventory may not include all controls and may therefore be a higher value than shown here.

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Summary Sheet: 2011 and 2017 On-Road Summaries

HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Table 2-8: HGB Eight-County RFP Ozone Season Weekday On-Road Mobile

RFP Analysis Year Inventory	Uncontrolled NO _x (tons per day)	Controlled NO _x (tons per day)
2011 Base Year	586.15	188.02
2017 Attainment Year	657.23	98.15

Table 2-9: HGB Eight-County RFP Ozone Season Weekday On-Road Mobile

RFP Analysis Year Inventory	Uncontrolled VOC (tons per day)	Controlled VOC (tons per day)
2011 Base Year	236.90	80.73
2017 Attainment Year	279.72	56.37

Table 2-13: 2017 HGB RFP Ozone Season Weekday On-Road Mobile Source NO_x and VOC Emissions and Control Strategy Reductions

RFP Analysis Year and Inventory of On-Road Mobile Emissions Inventory Strategies	NO _x (tons per day)	VOC (tons per day)
2017 Uncontrolled Inventory	657.23	279.72
Reformulated Gasoline (RFG) with Tier 3 Sulfur and ULSD	85.13	16.87
Post-1990 Federal Motor Vehicle Control Program (FMVCP)	464.25	198.54
Inspection and Maintenance (I/M)	6.89	7.94
On-road TxLED	2.81	0.00
2017 Controlled Inventory	98.15	56.37
QA Check	98.15	56.37

Note: IM program benefit set to 7.94 on Enter Reductions 2017 to correct for rounding error.

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Appendix 1 - Sheet 42

Summary Sheet: Calculation Process for 2017 Target Levels of Emissions
HGB Eight-Hour Ozone Nonattainment Area

Eight Nonattainment Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller

Table 3-1: Summary of the Calculation Process for 2017 HGB RFP Target Levels

Line	Description	NO _x	VOC
Line 1	Step 1: 2011 base year emissions inventory (see Table 2-13)	459.94	531.40
Line 2	Step 2: Add or subtract emissions that are to be included from outside the nonattainment area	0.00	0.00
Line 3	Revised 2011 RFP base year emissions inventory (see Table 2-13) (Line 1 minus Line 2)	459.94	531.40
Line 4	Percent of NO _x (PN) and VOC (PV) to meet 15% reduction requirement (PN plus PV = 15)	14.5	0.5
Line 5	Step 3: Calculate the 15% NO _x and VOC reduction requirement between 2011 and 2017 (Line 3 multiplied by Line 4)	66.69	2.66
Line 6	Step 4: Calculate the 2017 target level of emissions (Line 3 minus Line 5)	393.25	528.74
Q/A Check		393.25	528.74

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