

HGB Attainment Demonstration SIP Revision and Associated Rule Revisions for the 1997 Eight-Hour Ozone Standard

**Proposed at the
September 23, 2009, Agenda**

Regional Air Quality Planning Committee
Meeting - September 24, 2009



HGB Attainment Demonstration (AD) SIP Revision & Associated Rule Revisions for the 1997 Eight-Hour Ozone Standard

- Proposed HGB AD SIP Revision Overview
- 2018 HGB SIP Modeling and Weight of Evidence Corroborative Analyses
- Associated Proposed Rulemakings
 - Offset Lithographic Printing Rules in 30 TAC Chapter 115
 - MECT and HECT Rules in 30 TAC Chapter 101
- Proposed HGB Reasonable Further Progress (RFP) SIP Revision
- Public Comment Information

Proposed HGB AD SIP Revision Overview



Proposed HGB AD SIP Revision Overview

- HGB Attainment Demonstration (AD) SIP Revision
 - Addresses the severe ozone nonattainment area requirements of the Federal Clean Air Act (FCAA)
 - Demonstrates attainment of the 0.08 parts per million (ppm) 1997 eight-hour ozone standard by June 15, 2019



Key Elements of HGB AD SIP Revision

- Photochemical modeling analysis
 - Predicts ozone design values in 2018
 - Considers federal, state, and local control measures
 - Considers population and economic growth
- Weight of evidence evaluation
 - Quantitative corroborative analysis
 - Qualitative corroborative analysis



Key Elements of HGB AD SIP Revision

- Control Strategies and Required Elements
 - Summary of existing control measures
 - Updates to existing control measures
 - Reasonably Available Control Technology analysis
 - Reasonably Available Control Measures analysis
 - New control measures
 - Motor Vehicle Emissions Budgets (MVEBs)
 - Monitoring network update
 - Contingency Plan



Key Elements of HGB AD SIP Revision

- Ongoing and Future Initiatives
 - Flare Task Force
 - Technologies for detecting volatile organic compounds (VOC)
 - Mid-course SIP review option
 - 2008 ozone standard



Timeline

- Public Hearings
 - October 28th at 2:00 and 6:00 pm in Houston at HGAC
 - October 29th at 3:00 pm in Austin at TCEQ
- *Texas Register* publication: October 9, 2009
- Comment Period: October 9 – November 9, 2009
- Adoption: March 2010
- Submittal to the EPA: no later than April 15, 2010



Contact Information

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2018 HGB AD SIP Revision Modeling and Weight of Evidence Corroborative Analyses



CAMx Ozone Modeling in SIP Development

The Big Picture

Base Case

Day-specific meteorology and emissions;
replicate what actually happened

Baseline Case

Day-specific meteorology and Typical
emissions; used in Relative Response Factor
(RRF) to predict future design values

Future Base Case

Apply future growth + on-the-books controls
to estimate future ozone

Control Strategy Testing

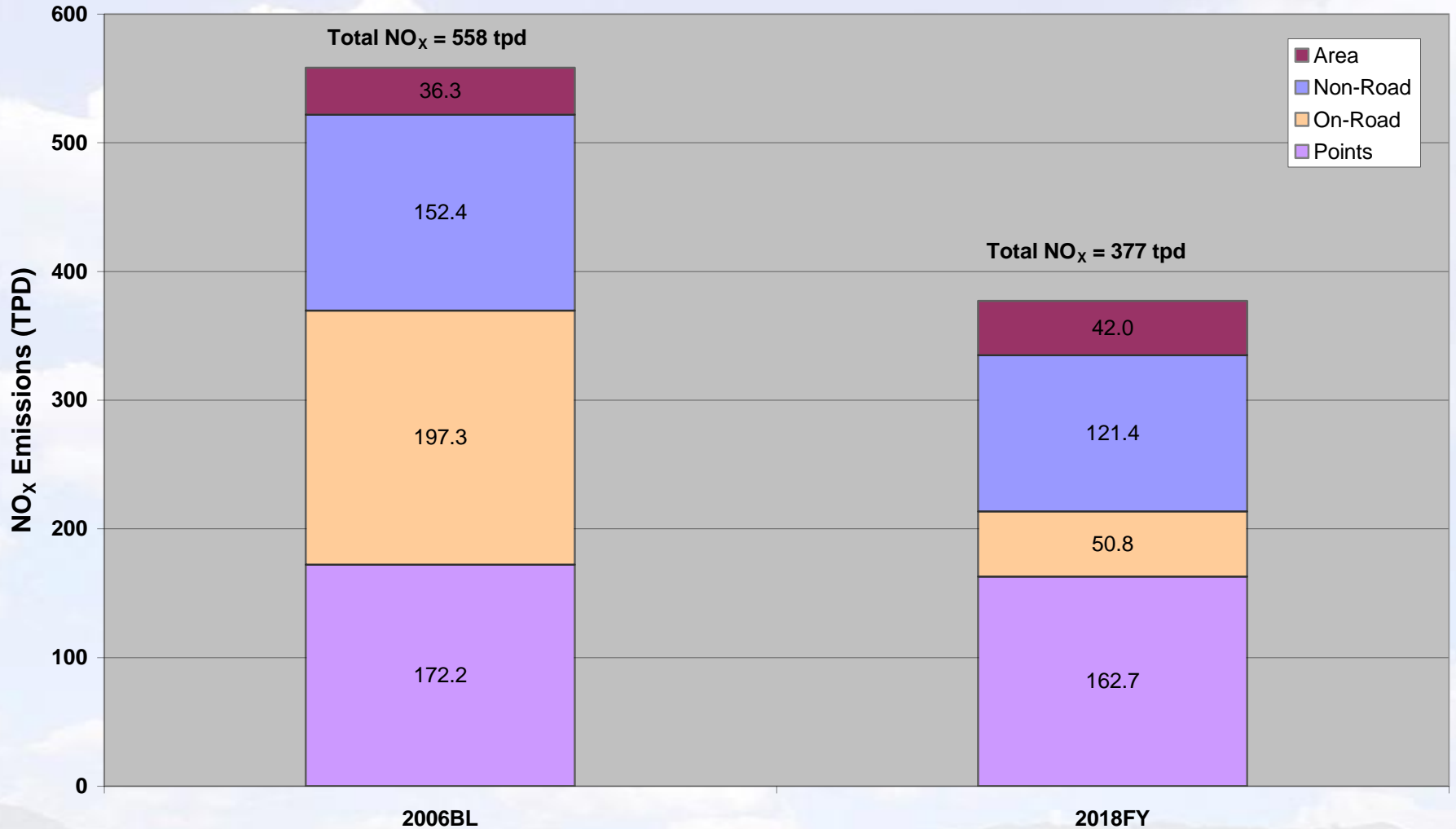
Determine control strategies that will
effectively reduce ozone

SIP

Document modeling procedures

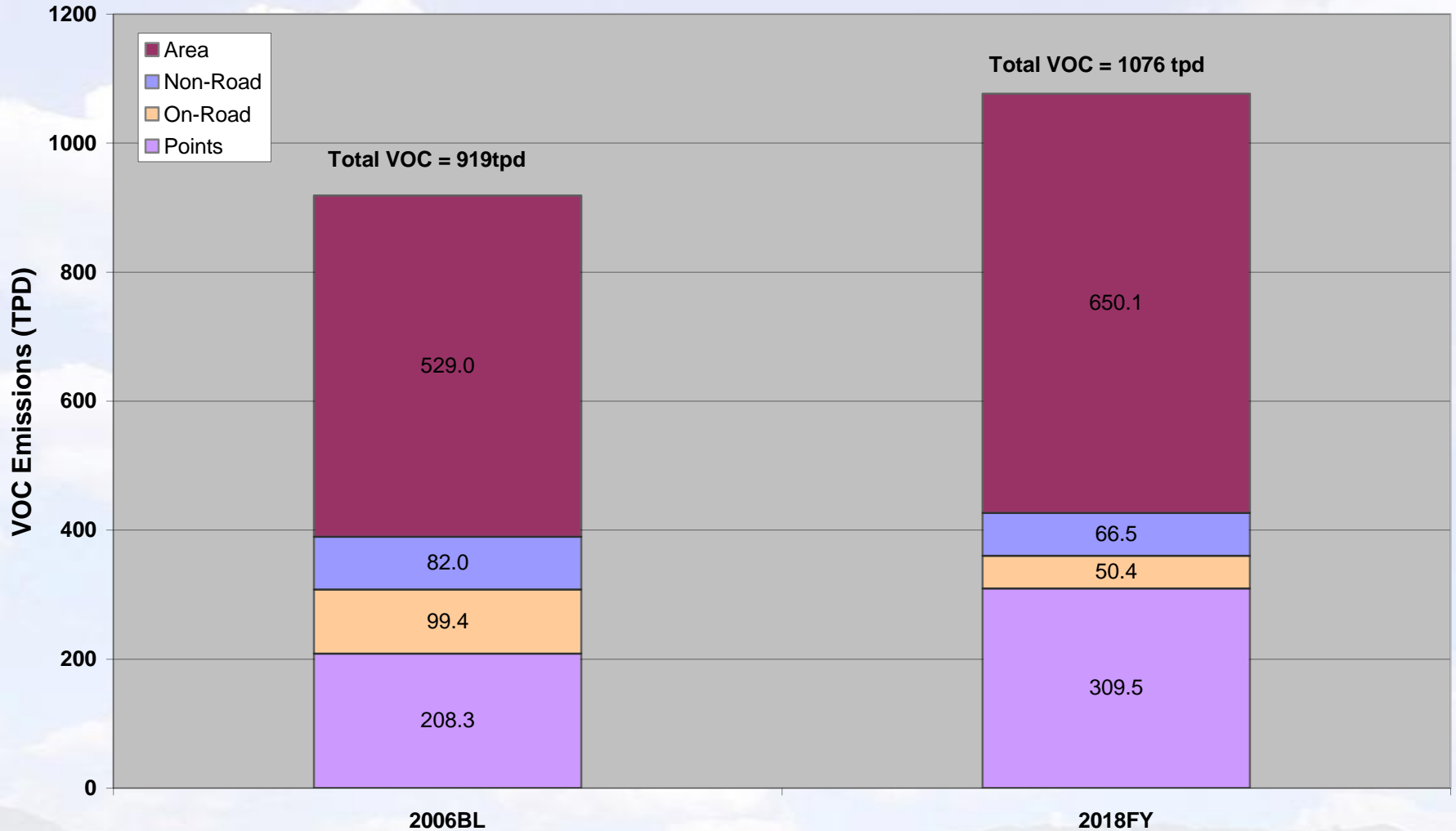


2006 Baseline and 2018 Future Anthropogenic NO_x Modeling Emissions HGB Eight-County Area





2006 Baseline and 2018 Future Anthropogenic VOC Modeling Emissions HGB Eight-County Area





2018 Future Modeling Results

Site Code	2006 Baseline Design Value (ppb)	RRF: EPA Method	DV ₁₈ : EPA Method
BAYP	96.7	0.8994	87.0
C35C	79.0	0.9590	75.8
CNR2	83.0	0.8773	72.8
DNCG	80.3	0.8941	71.8
DRPK	92.0	0.9580	88.1
GALC	83.0	0.9553	79.3
H03H	84.0	0.9590	80.6
HALC	85.0	0.9199	78.2
HCHV	82.7	0.9577	79.2
HCQA	87.0	0.8994	78.3
HLAA	77.7	0.8885	69.0
HNWA	89.0	0.8691	77.4
HOEA	80.3	0.9588	77.0
HROC	79.7	0.9602	76.5
HSMA	90.3	0.9344	84.4
HTCA	79.3	0.9422	74.7
HWAA	76.3	0.9380	71.6
LKJK	77.0	0.9028	69.5
LYNF	81.7	0.9604	78.5
MACP	90.7	0.8999	81.6
MSTG	84.7	0.9168	77.6
SBFP	85.3	0.9450	80.6
SHWH	92.3	0.8586	79.2
TXCT	84.3	0.9461	79.8
WALV	92.0	0.9595	88.3



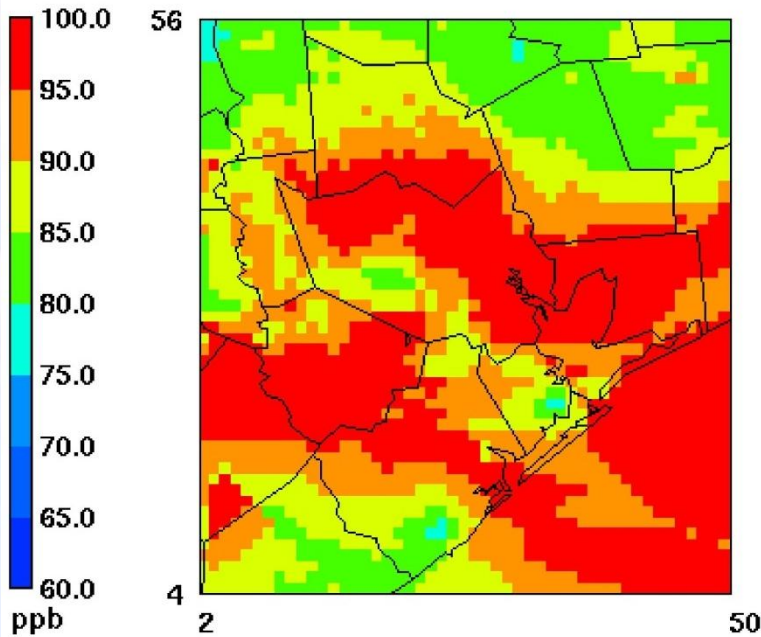
Regulatory Monitoring Sites with $DV_{18s} \geq 85$ ppb



Reduction in Exceedance Area 2006 Baseline to 2018 Future, Compared to 2000

2000 Baseline Ozone Design Value

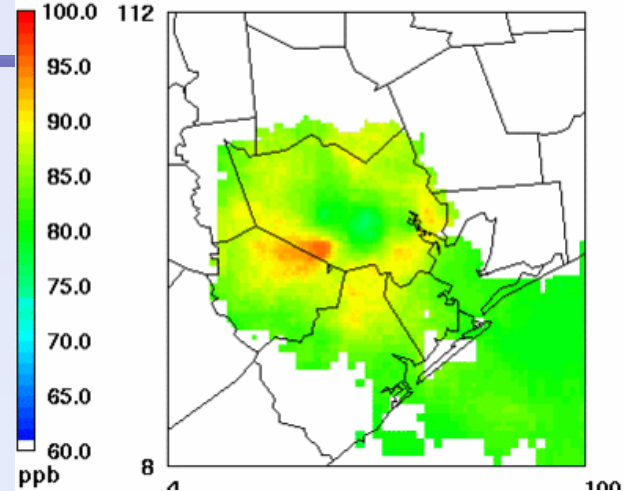
camx431_cb4.hgb8h.b2000c.pscfolev1.TCEQuh1_eta_tke
Aug 18 - Sep 6, 2000 (Baseline Ozone > 70 ppb)



Min=77.3 at (34,21), Max=113.8 at (4,26)

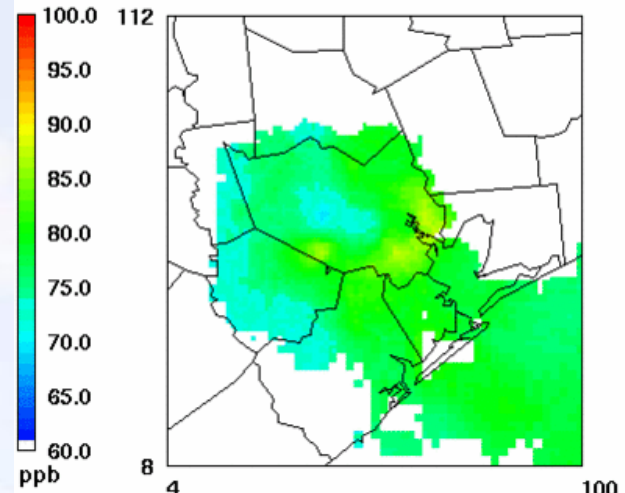
2006 Baseline Ozone Design Value

bl06.reg2.mixed_met 3
2005/2006 Episodes (EPA RRF criteria)



2018 Projected Ozone Design Value

fy18.cs04.mixed_met 3
2005/2006 Episodes (EPA RRF criteria)



Min= 0.0 at (4,8), Max= 87.9 at (58,57)

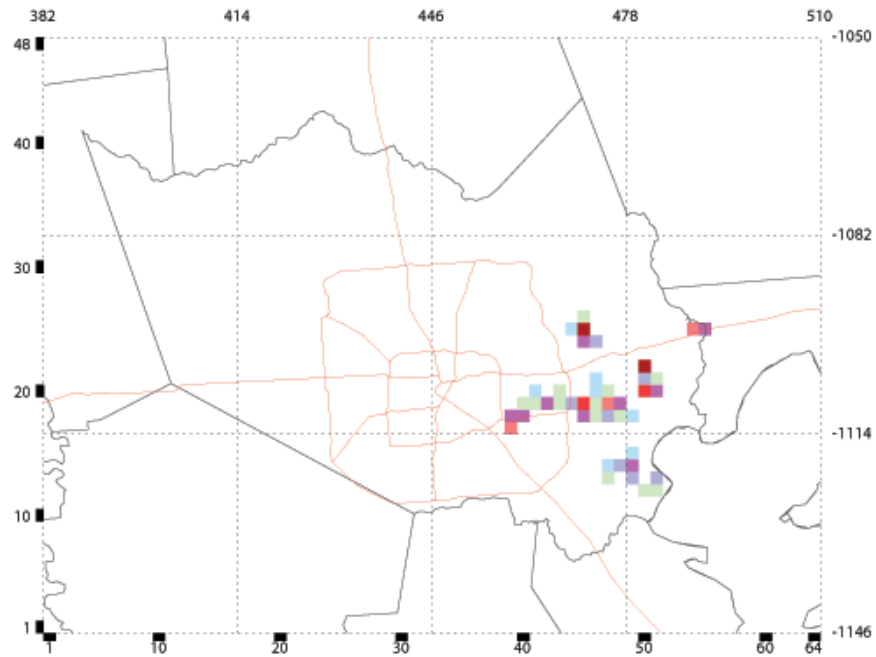


HECT and VMEP Sensitivity Modeling

- Determine the sensitivity of projected 2018 eight-hour ozone design values (DV_{18s}) for monitoring sites in the HGB eight-county nonattainment area to a reduction in the HECT cap plus mobile source VMEP reductions
- HECT applicable sources in Harris County were modeled at 75 percent of their allocation, i.e., a 2.7 tons per day (tpd) reduction in HRVOC (CB05-VOC speciation)
- On-road and non-road mobile sources were modeled with a 1.55 tpd and 0.70 tpd, respective NO_x reduction



Difference in Emissions Between 2018 Future Base and HECT Sensitivity

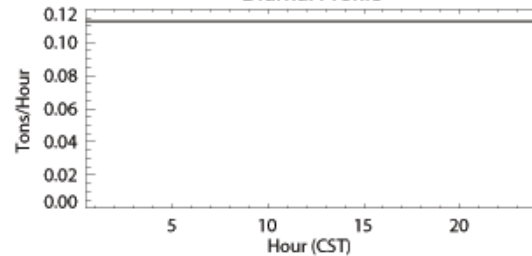


fy18.cs03_075HECT HRVOC Emissions Reduction from fy18.cs03



Max: 0.367 t/d (481, -1103); Min: 0.000 t/d (383, -1145)

Diurnal Profile

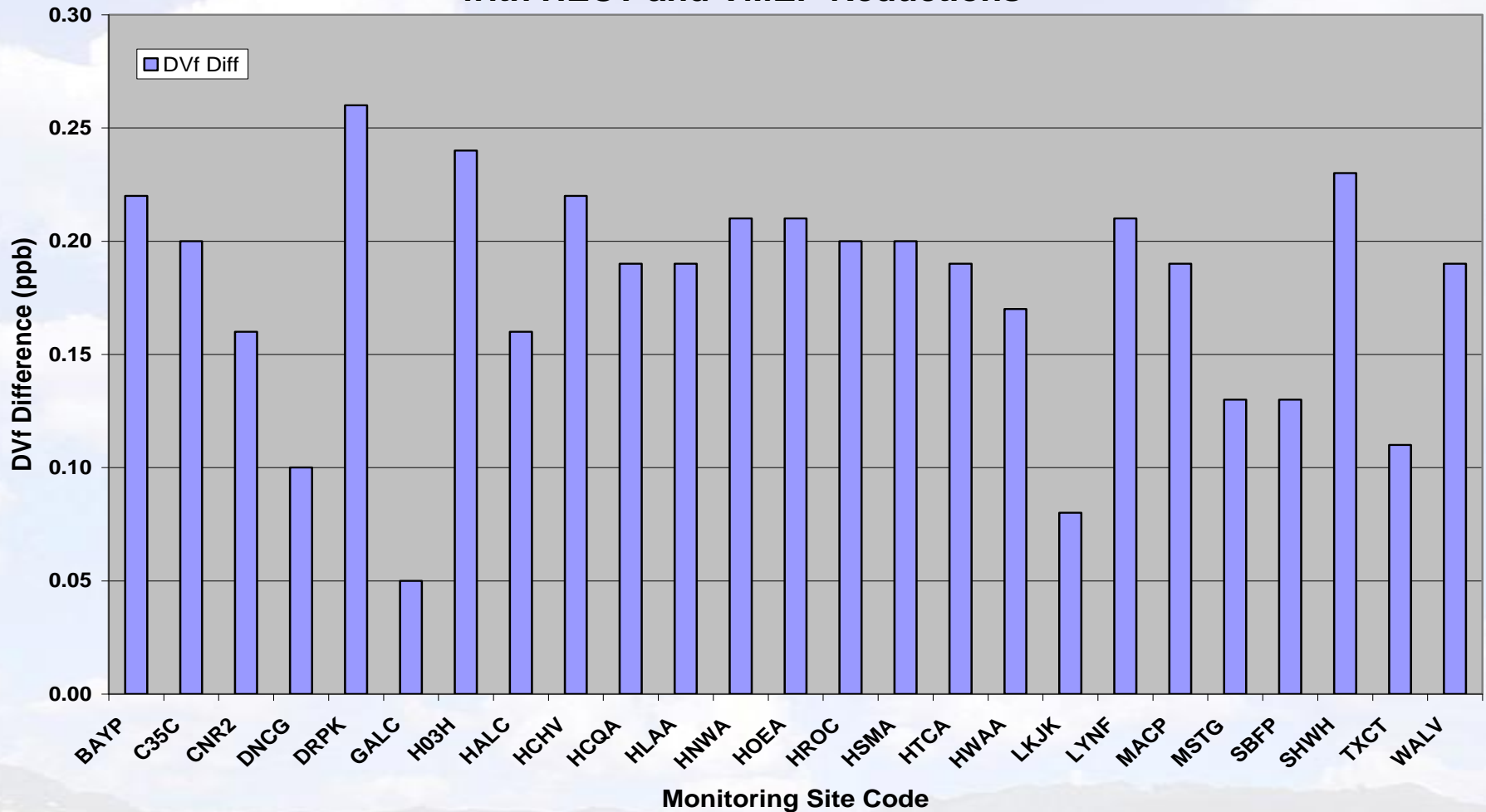


Total Reduction
2.70604 T/D



HECT and VMEP Sensitivity Modeling

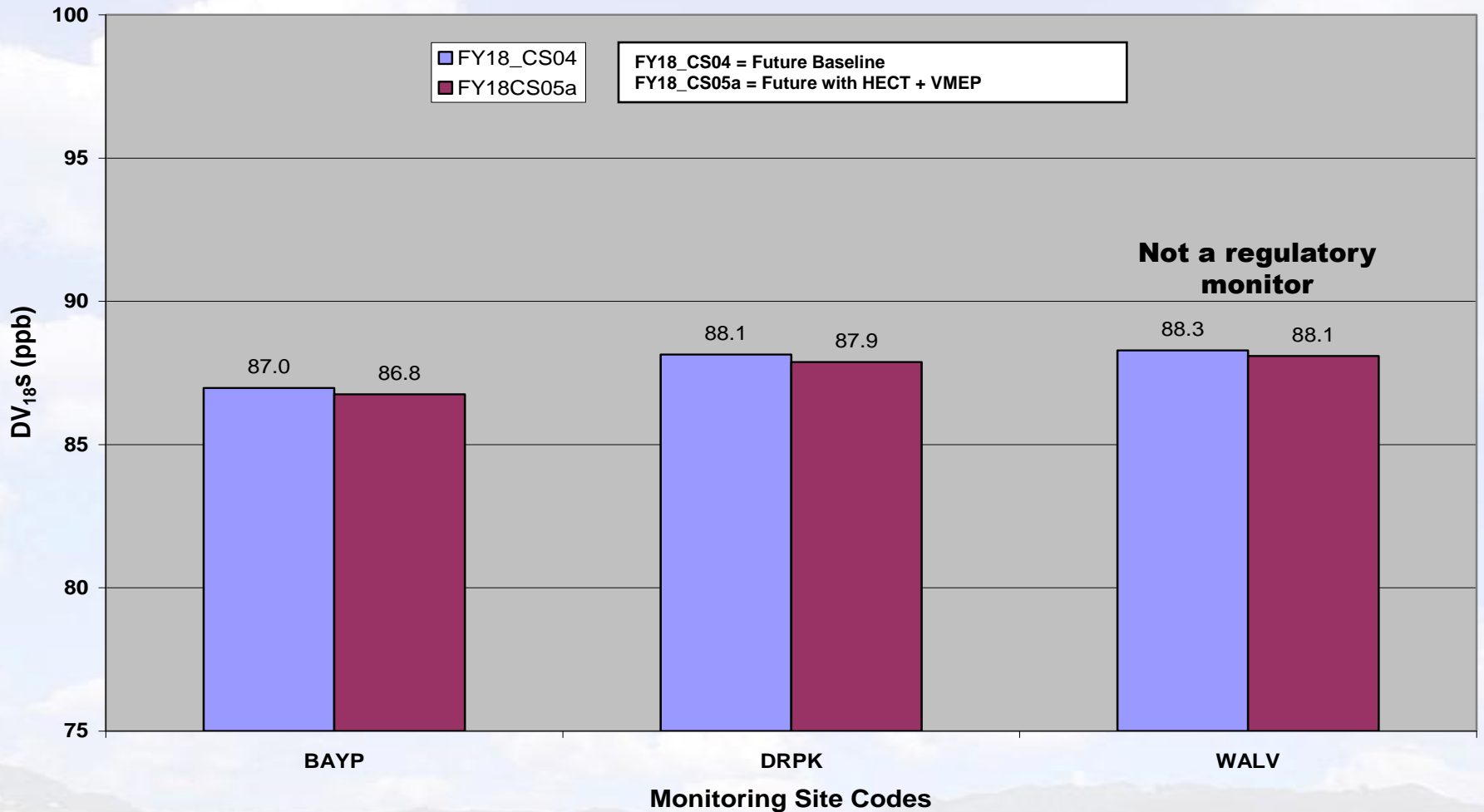
2018 Eight-Hour Design Value Difference
with HECT and VMEP Reductions





HECT and VMEP Sensitivity Modeling

2018 Predicted Eight-Hour Design Values
with HECT and VMEP Reductions



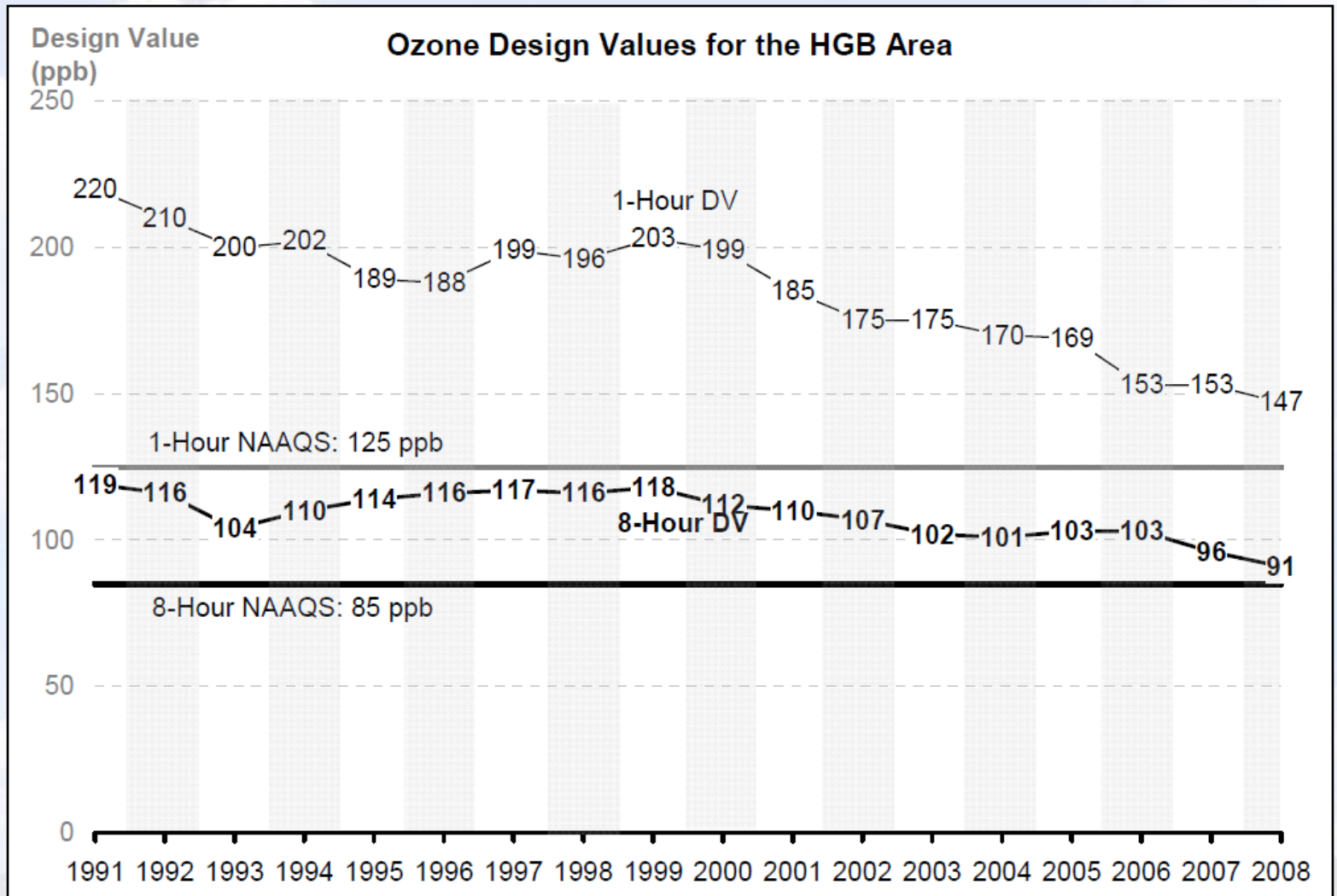


Weight of Evidence Quantitative Corroborative Analysis

- Ozone trends
- NO_x trends
- HRVOC trends
- Background ozone concentrations
- Conclusions



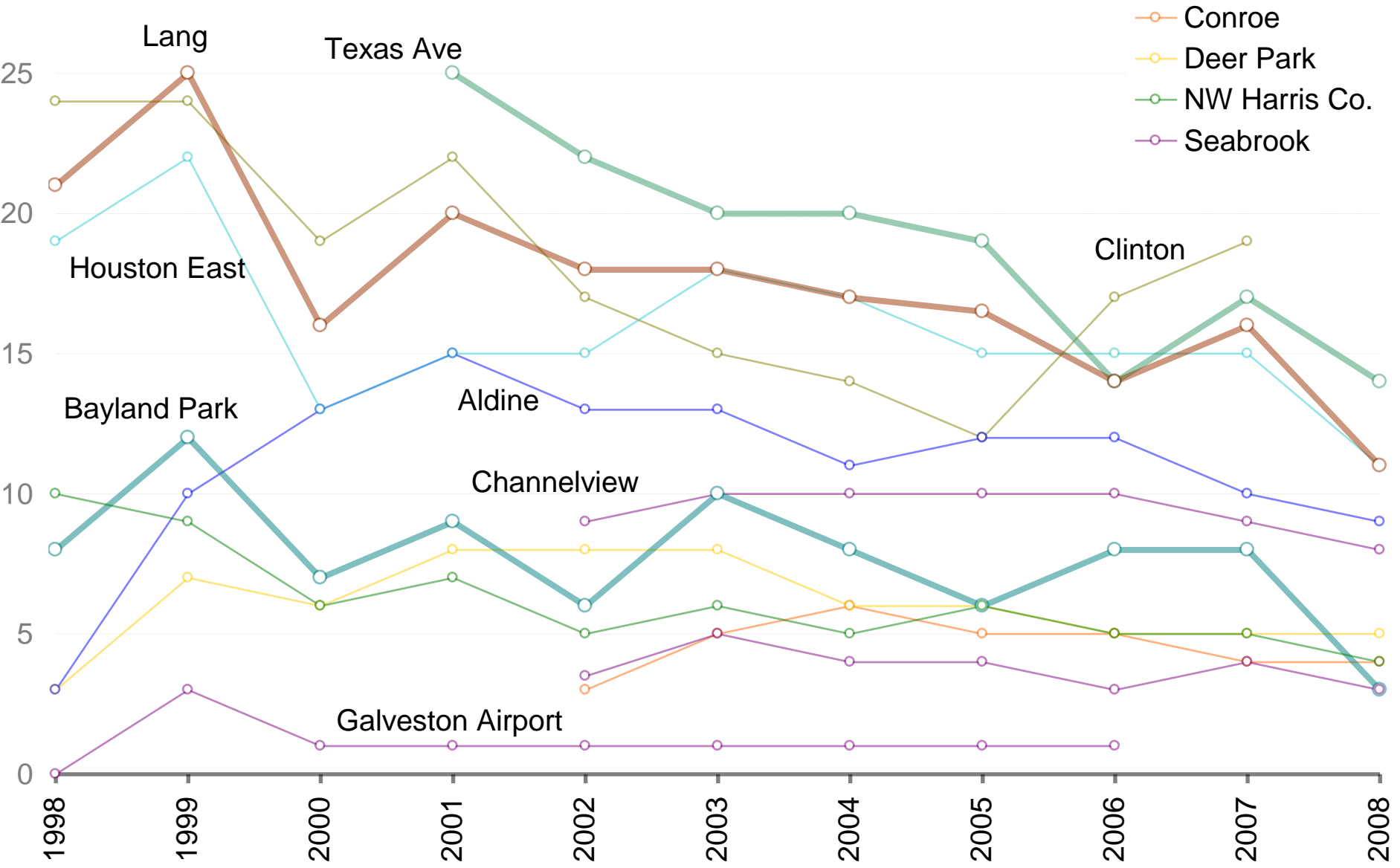
Ozone Design Values for the HGB Area



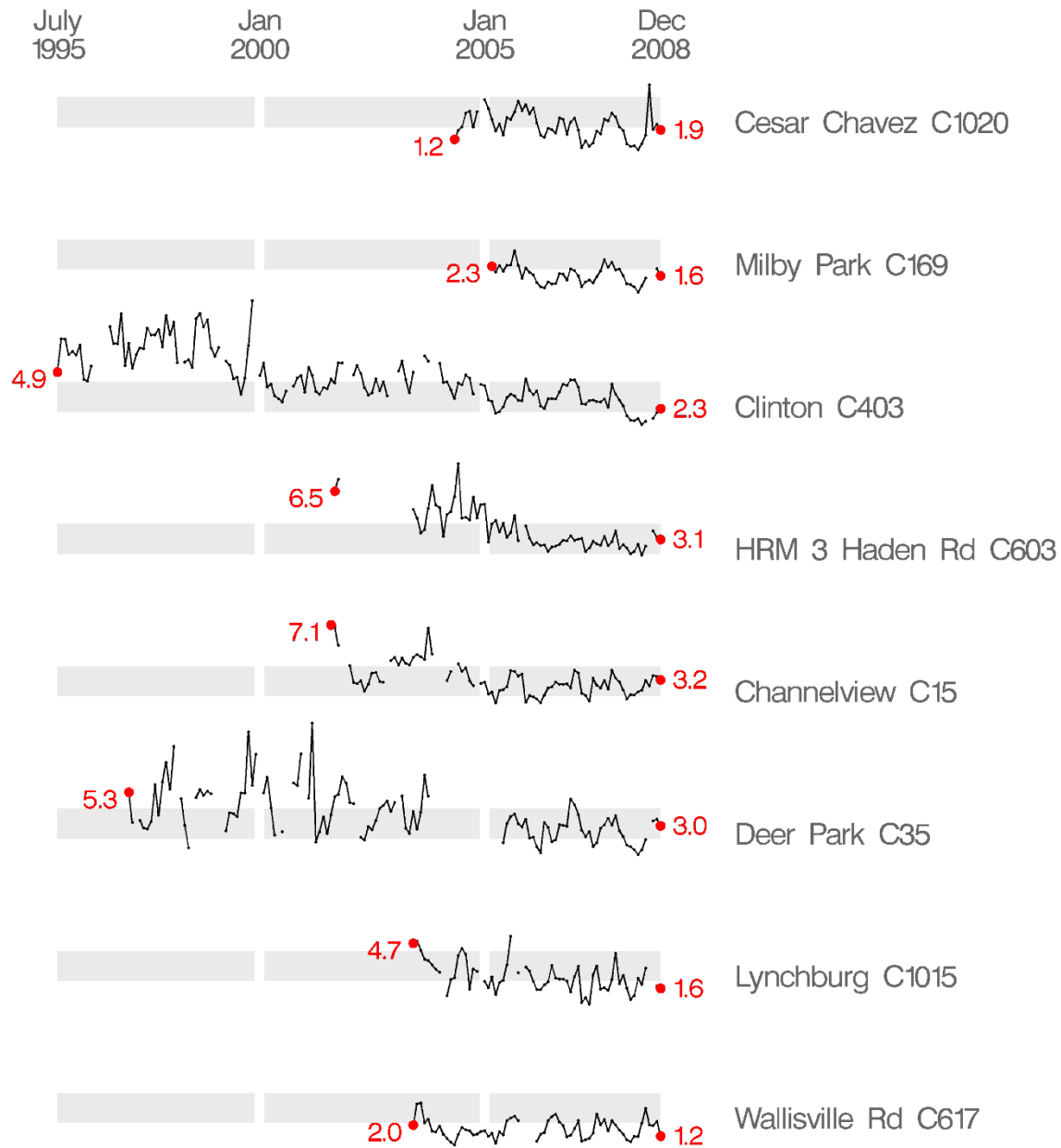
Median NO_x Concentrations in the HGB Area (May - Oct.)

NO_x
(ppb)

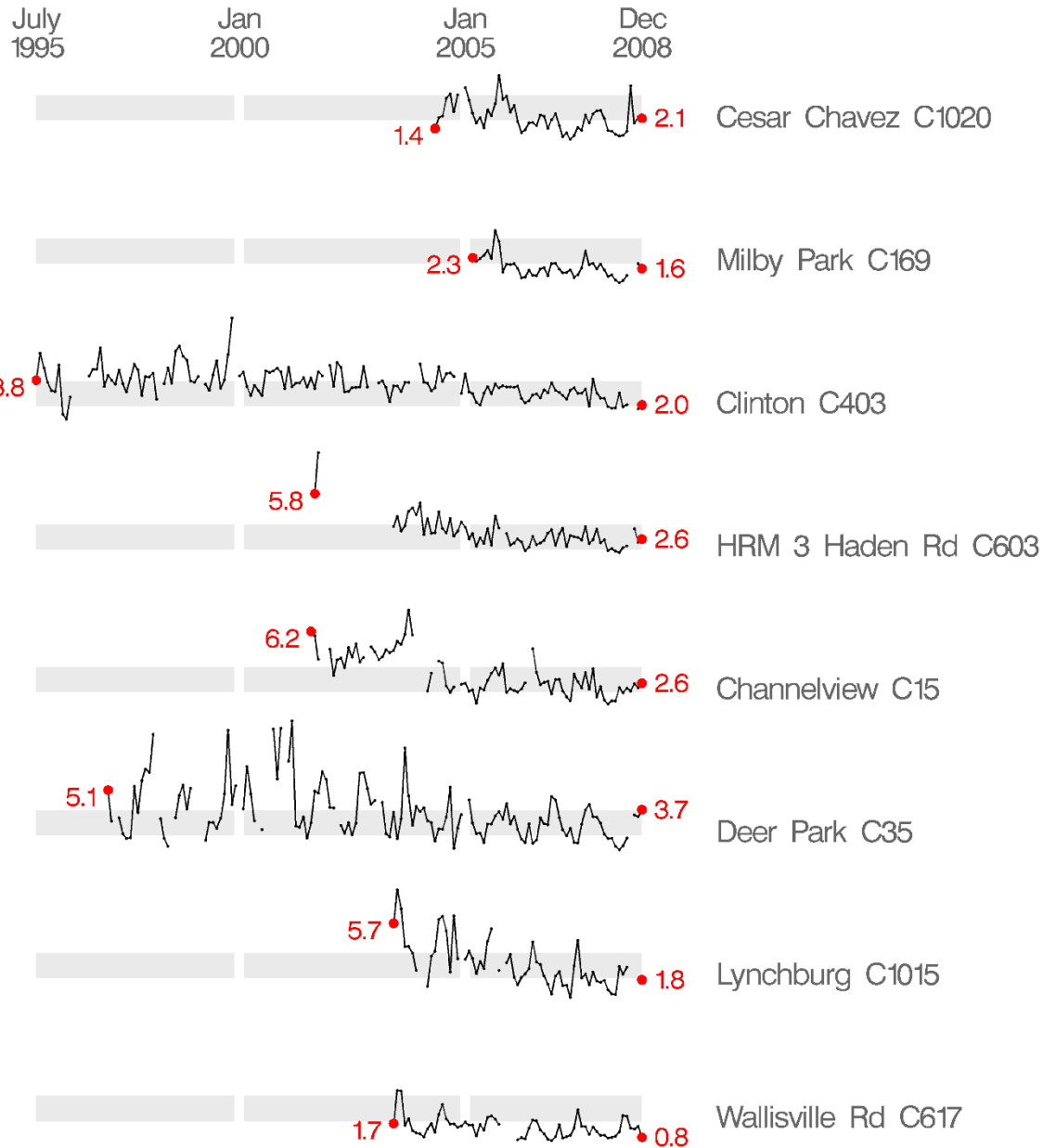
- Conroe
- Deer Park
- NW Harris Co.
- Seabrook



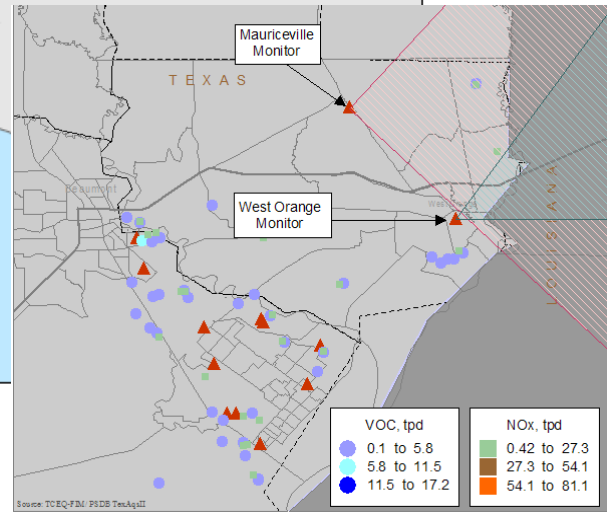
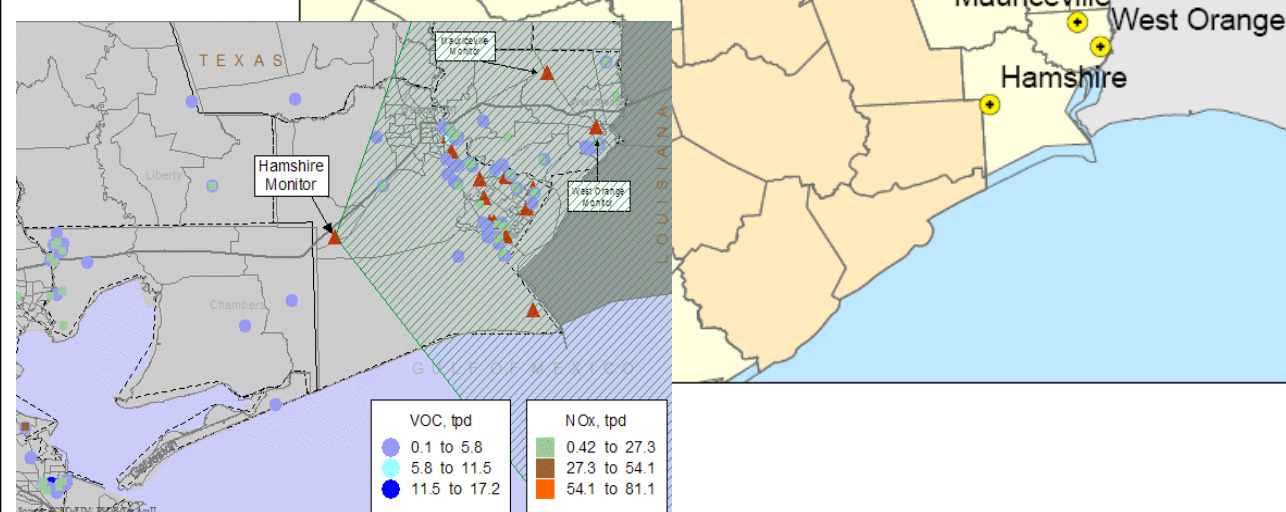
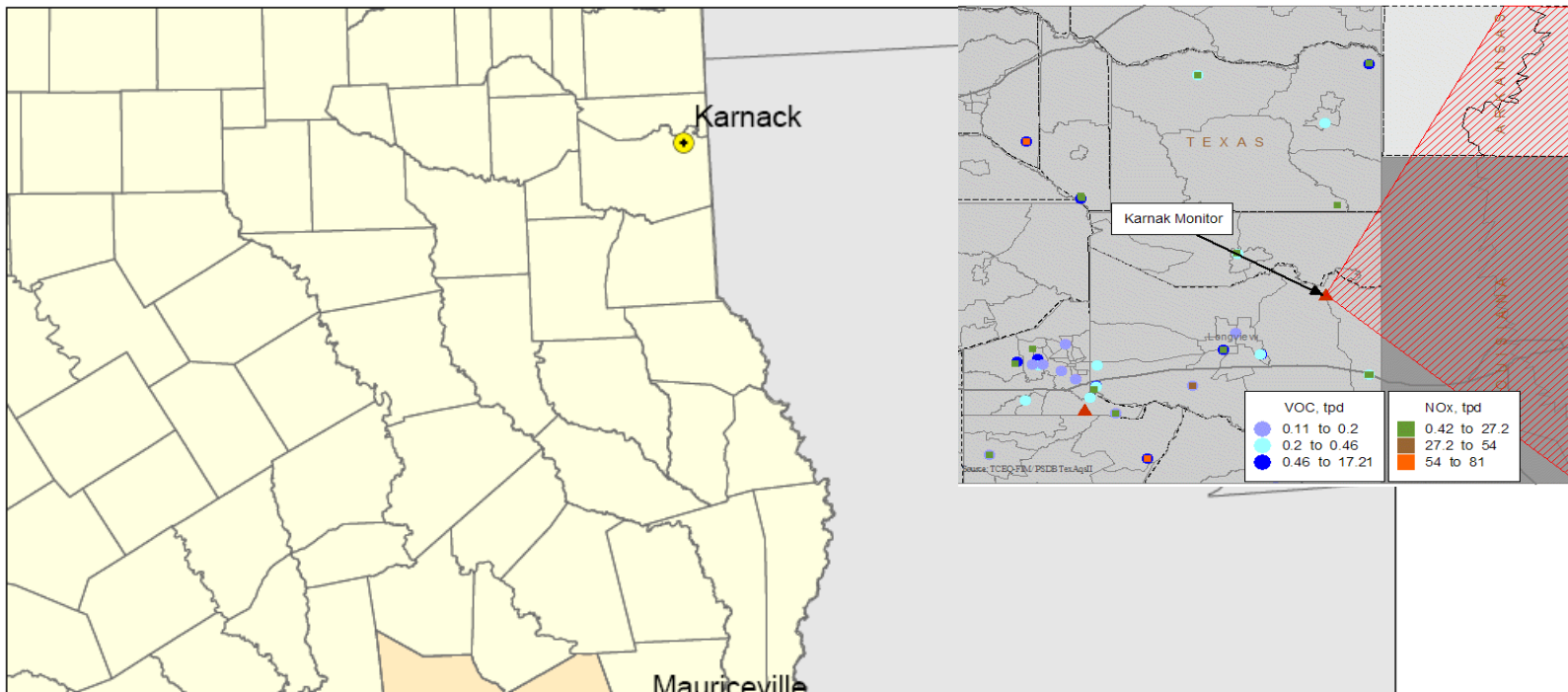
Geo. Mean Ethylene (1-hr AutoGC, ppbC) by Month



Geo. Mean Propylene (1-hr AutoGC, ppbC) by Month

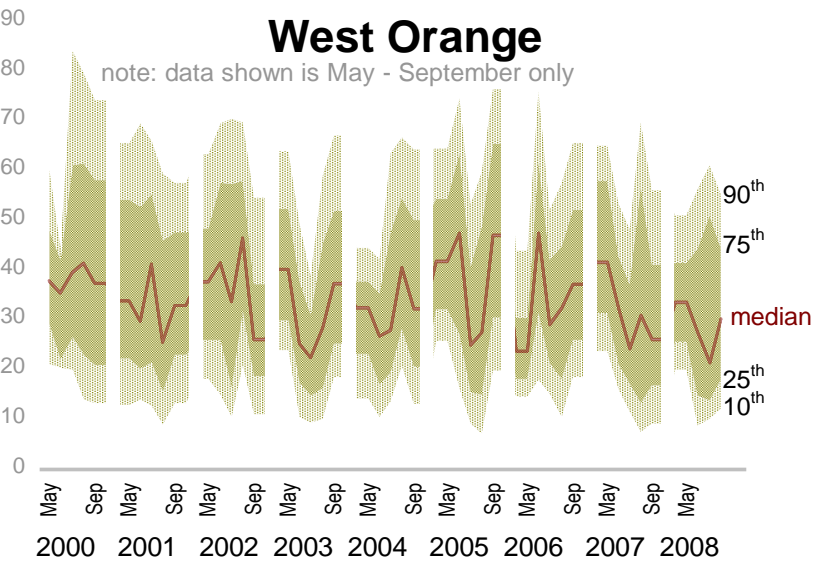


Map of Background Ozone Sites



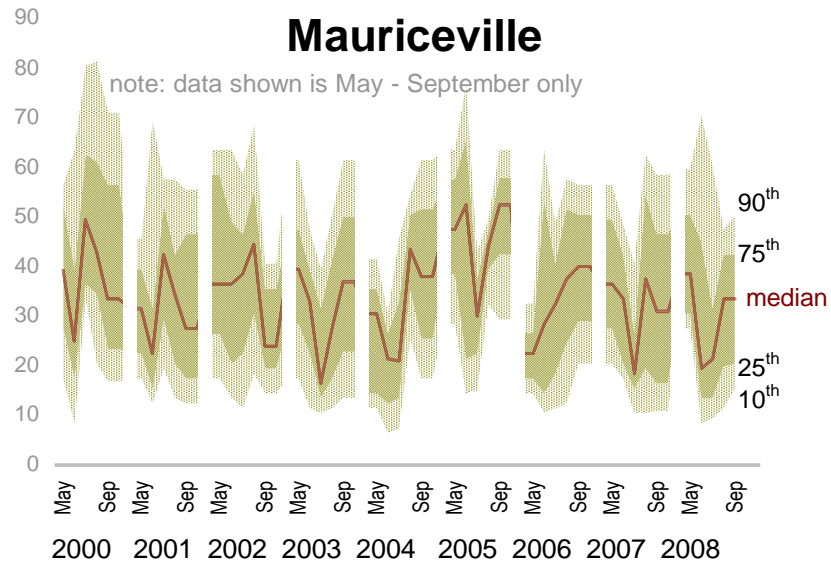
West Orange

note: data shown is May - September only



Mauriceville

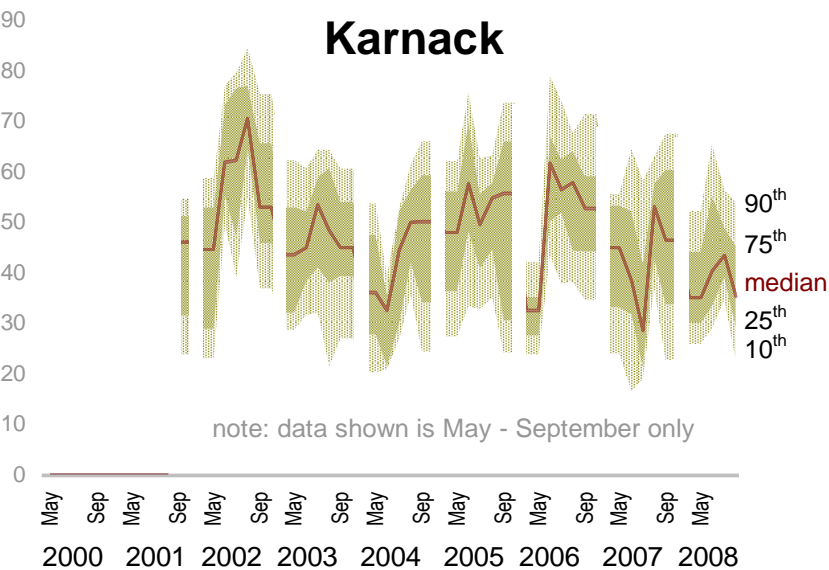
note: data shown is May - September only



No discernable trends are present at West Orange, Mauriceville, or Hamshire. Karnack shows a slight downward trend, perhaps.

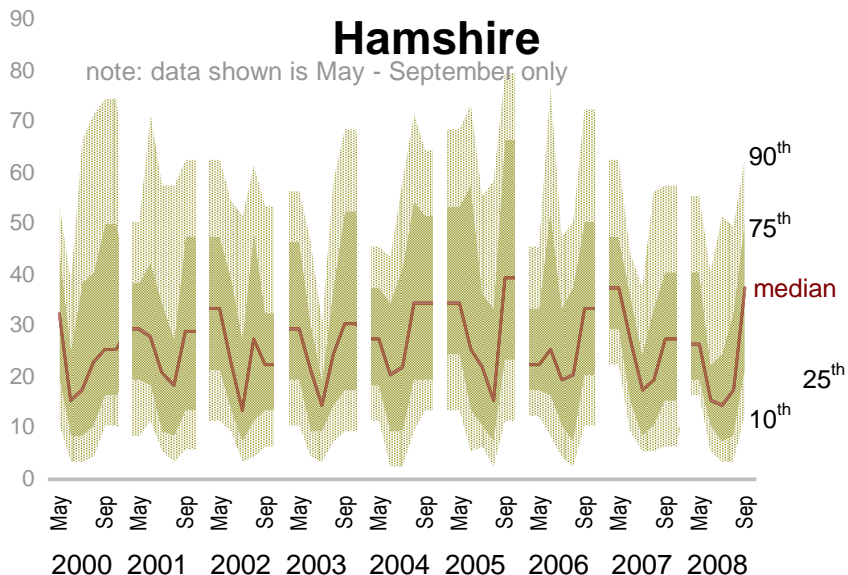
Karnack

note: data shown is May - September only



Hamshire

note: data shown is May - September only





Conclusions

- Eight-hour ozone design values show a decreasing trend from 119 ppb in 1991 to 91 ppb in 2008.
- The trends in NO_x and HRVOC show decreases commensurate to ozone concentrations.
- Background ozone appears to have remained relatively constant, at least since 2000.
- Therefore, the decreasing ozone trends can be attributed to the decrease in local (HGB) NO_x and HRVOC emissions, which will continue to decrease providing evidence attainment will be achieved by 2019.



Weight of Evidence Qualitative Corroborative Analysis

The qualitative corroborative analysis includes additional air quality improvement measures that cannot be included in the photochemical modeling analysis because they cannot be accurately quantified. These measures provide additional evidence to support the attainment demonstration.



Additional Air Quality Improvement Measures

- New International Marine Diesel Engine and Marine Fuel Standards for Oceangoing Vessels and Emissions Control Areas
- SmartWay Transport Partnership and the Blue Skyways Collaborative
- Control of VOC Emissions from Flash Emissions
- Energy Efficiency and Renewable Energy Measures
- Clean Air Interstate Rule



Additional Air Quality Improvement Measures

- AirCheckTexas Drive a Clean Machine
- Clean School Bus Program
- Texas Emission Reduction Plan (TERP)
- American Waterways Operators Tank Barge Emissions Best Management Practices
- Local Initiative Projects
- Potential Local Programs submitted by the Houston-Galveston Area Council



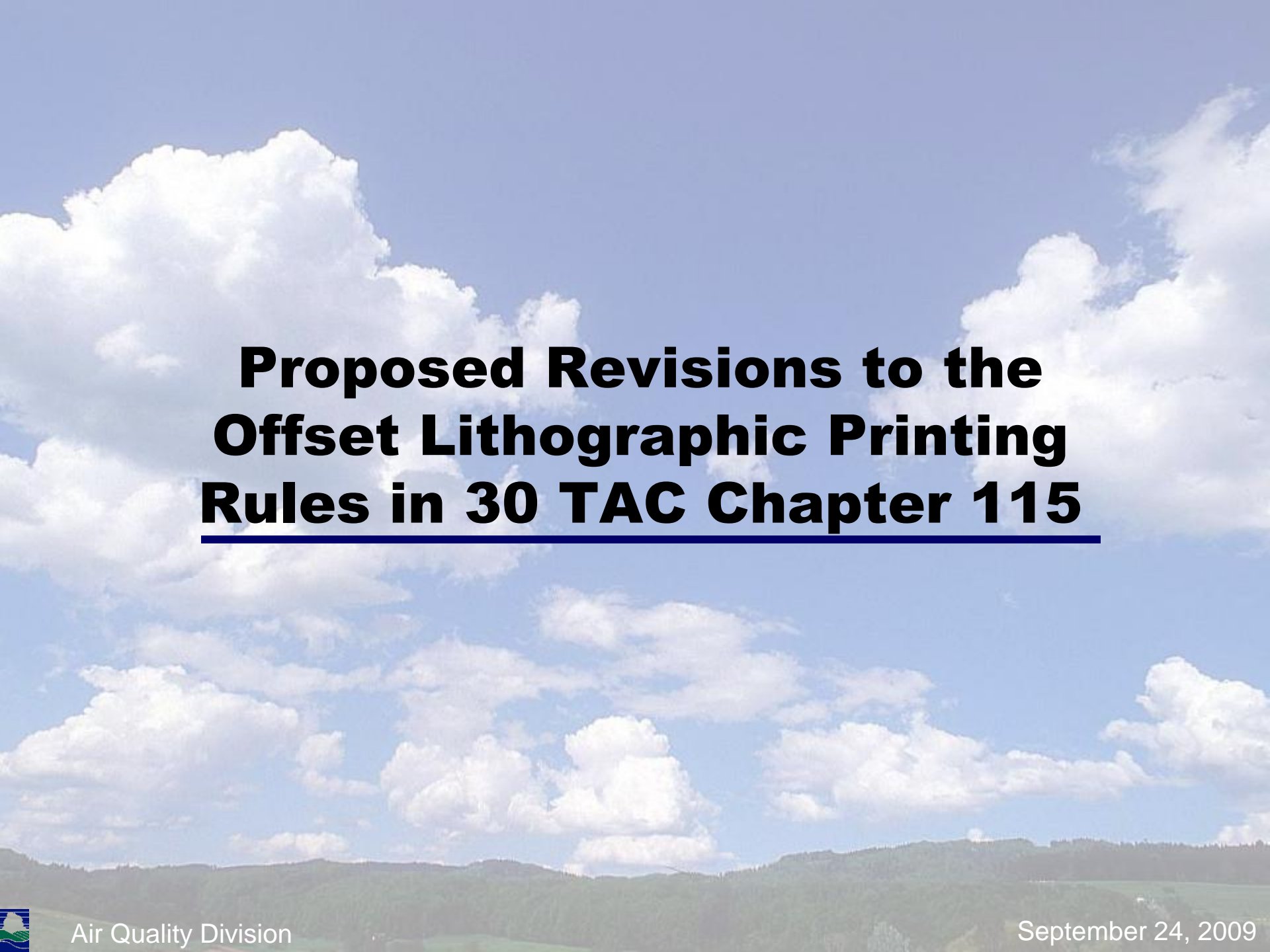
81st Texas Legislature, 2009

- House Bill (HB) 432 requires state agencies that purchase passenger vehicles or other ground transportation vehicles to ensure that not less than 25% of new vehicles purchased during a biennium meet or exceed the EPA's Tier II, Bin 3 emission standards.
- HB 1796 establishes a New Technology Implementation Grants program for facilities and stationary sources under TERP, requires current New Technology Research and Development under TERP to be administered by TCEQ, and extends TERP to August 31, 2019.
- Senate Bill 1759 establishes a Texas Clean Fleet Program that provides grants to encourage large fleets to replace diesel-powered fleet vehicles with hybrid vehicles or alternative fuel-powered vehicles.



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Proposed Revisions to the Offset Lithographic Printing Rules in 30 TAC Chapter 115



Background Information

- The EPA issues control techniques guidelines (CTG) documents in lieu of national rules for specific volatile organic compound (VOC) emission sources.
 - CTGs assist states in evaluating reasonably available control technology (RACT) for nonattainment areas classified as moderate or above.
 - States must determine if controlling these CTG emission sources is technologically and economically feasible.
 - States can use the EPA's control recommendations in the CTG or implement different approaches to controlling emissions from the sources.
- The EPA issued the CTG for Offset Lithographic and Letterpress Printing in 2006.
 - No letterpress printing operations were identified.



Offset Lithographic Printing

- Proposed revisions to 30 TAC Chapter 115, Subchapter E, Division 4.
 - Rule Project Number 2008-019-115-EN
- Applies to offset lithographic printing lines in the HGB and DFW nonattainment areas located on a property with combined VOC emissions of at least 3 tons per year of VOC when uncontrolled.
- Limits the VOC content of the fountain solutions and cleaning solutions used by these operations.
 - Provides several compliance options
 - Includes monitoring, testing, and recordkeeping requirements



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Proposed Revisions to the MECT and HECT Rules in 30 TAC Chapter 101



MECT Rulemaking 2009

Revisions to the Mass Emissions Cap and Trade (MECT) program would be to minimize future increases in the cap on nitrogen oxides (NO_x) emissions and include a clarification of the definition of “uncontrolled design capacity” to provide Municipal Utility Districts (MUDs) increased flexibility for rule compliance.



MECT Rulemaking Components

- Discontinue the ability to allocate allowances to major sources that missed the 2001 submittal deadline for initial allocation.
- Revise the definition of “uncontrolled design capacity” for MUDs to provide the option of using hours of operation for emergency generators.



HECT Rulemaking 2009

- The Highly Reactive Volatile Organic Compound (HRVOC) Emissions Cap and Trade (HECT) program rulemaking includes:
 - A commitment to reallocate HECT allowances
 - Actual emissions monitoring data are now available
 - 25 percent Harris County HRVOC cap reduction



Rulemaking Overview

- Harris County HRVOC cap reduction for HECT
- Reallocate HECT program in 2011
- Monitored emissions-based reallocation
- Step-down cap reduction beginning with 10 percent in 2014
- Three additional 5 percent step-downs in 2015, 2016, and 2017



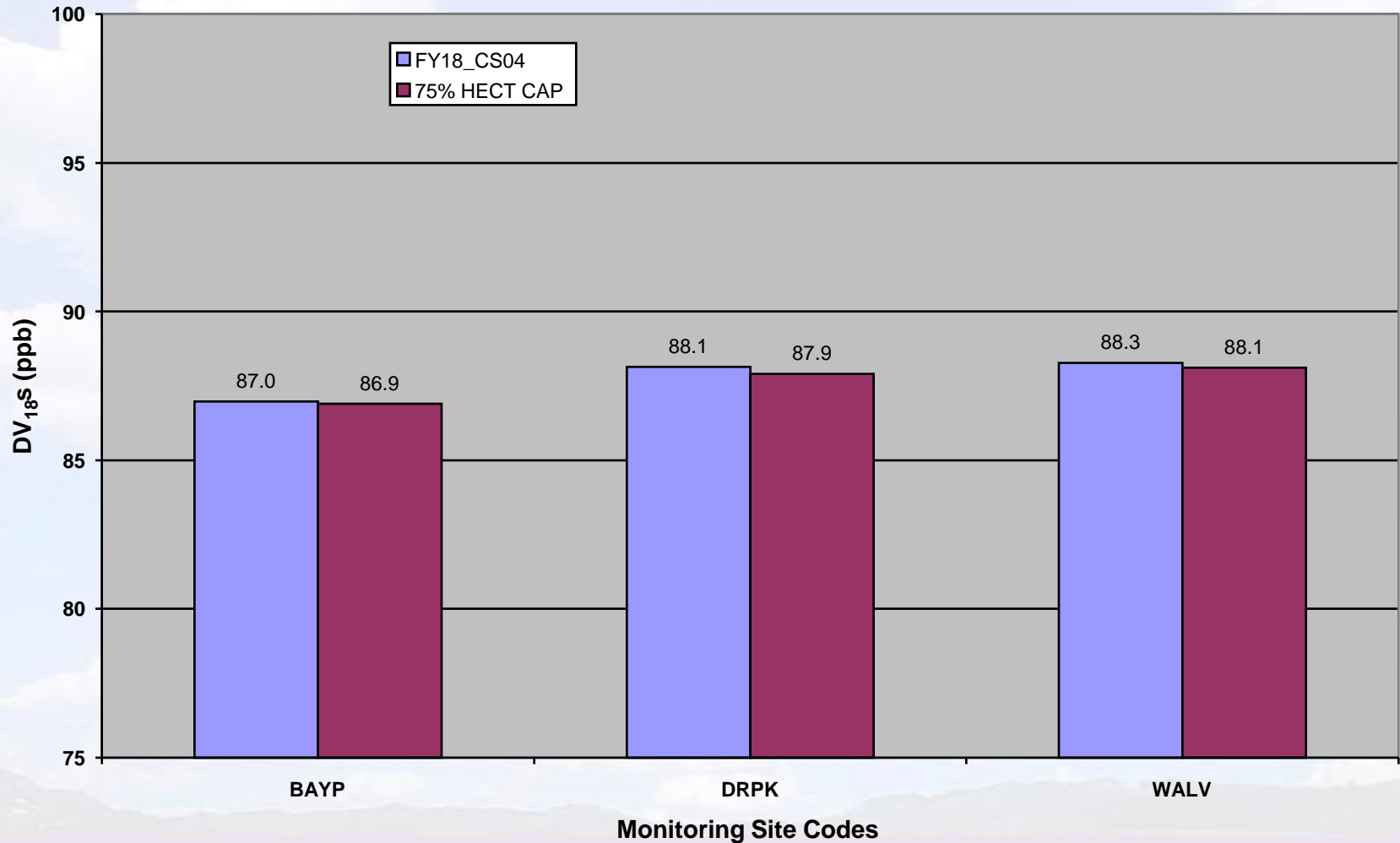
HECT Key Rule Components

- Photochemical modeling analysis demonstrates that a 25 percent reduction of the cap on the total Harris County HRVOC allocation would contribute to attainment of the 1997 eight-hour ozone standard as expeditiously as practicable.
- Initial allowance allocation was not equitably distributed - some sites did not receive enough allocations while other sites received allocations greater than necessary.



HECT Sensitivity Modeling

2018 Predicted 1997 Eight-Hour Design Values with 25% Reduction in HECT Cap

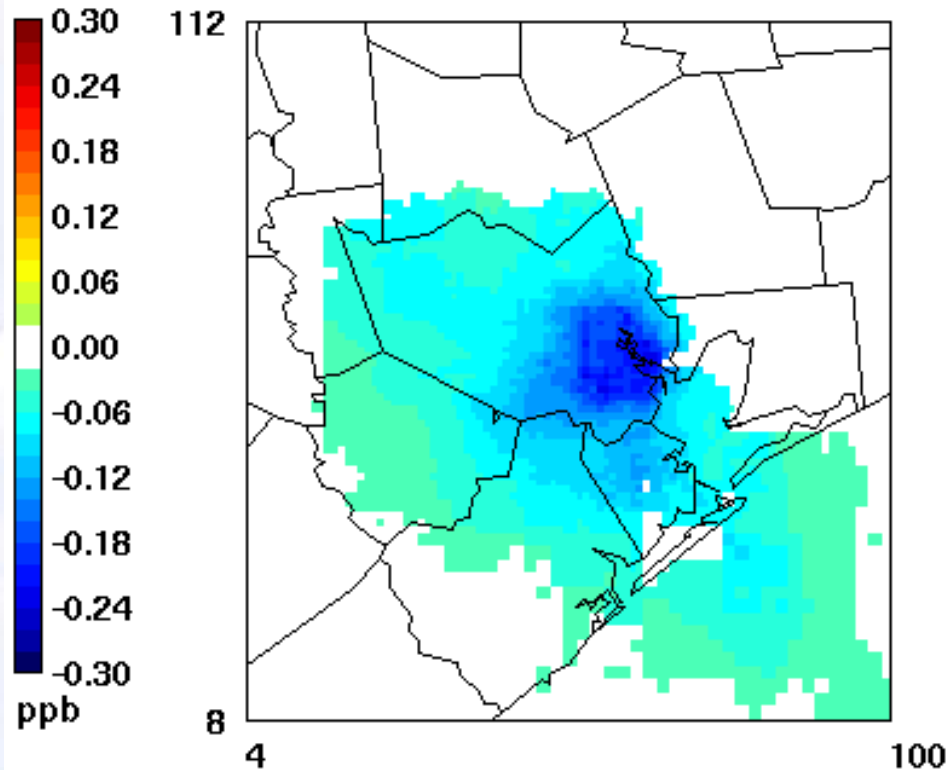




HECT Sensitivity Modeling

Ozone Design Value Diff

fy18.cs04_075HECT - fy18.cs04
Baseline: bl06.reg2 (EPA RRF criteria)



Min=-0.24 at (64,62), Max=0.00 at (4,8)



HECT Sensitivity Modeling

Emissions Changes			Results in Eight-County HGB Area			
	NO _x (tpd)	VOC (tpd)	Avg DV ₁₈ change	DV ₁₈ at BAYP	DV ₁₈ at DRPK	DV ₁₈ at WALV
2018 Future Case	0.0	0.0	N/A	86.97 ppb	88.14 ppb	88.28 ppb
25% Reduction to HECT Cap	0.0	2.7	0.11 ppb	86.90 ppb (0.07 ppb)	87.90 ppb (0.24 ppb)	88.12 ppb (0.16 ppb)

DV₁₈ = Predicted Design Value in 2018

ppb = parts per billion



HECT Reallocation Methodology Fundamentals

- Use the two highest emission years from 2006 through 2009 actual emissions data
- Create industry-type sector pools
- Create emission event set-aside pool
- Increase minor source minimum allocation to 10 tons per control period
- Calculate “uncontrolled emissions” using control efficiencies for flares and for other combustion units receiving HRVOC waste streams, and average actual emissions 2006 through 2008



HECT Reallocation Methodology Fundamentals, cont.

- Industry Sectors
 - Refineries
 - Chemical Manufacturers
 - Polymer/Plastics Producers
 - Storage/Other



HECT Emission Event Set-Aside

- Proposed emission event set-aside pool is 250 tons
 - Total Harris County reported emission events for 2006: 225 tons
 - Total Harris County Hurricane Ike associated emissions, 9/7 – 9/15, 2008: 196 tons



HECT Available Cap

- Total modeled available Harris County HRVOC cap:
 - 3,633.1 tons
- Subtract required EPA 5 percent environmental contribution:
 - 3,451.4 tons
- Subtract 250 ton emission event set-aside – final available cap for reallocation:
 - 3,201.5 tons
- 25 percent cap reduction final available cap:
 - 2,338.6 tons



Uncontrolled Emissions Based Reallocation

Allocation = 3201.5 (Sector Share %) (Facility Share)

Sector Share = [actual average emissions for industry sector/total actual emissions for all sectors]

Facility Share = The sum of the total average actual emissions for non-flare facilities and uncontrolled emissions for flares as well as heaters, boilers, and furnaces combusting HRVOC streams, for the baseline emissions period divided by the total uncontrolled actual average emissions for the industry sector baseline emission period



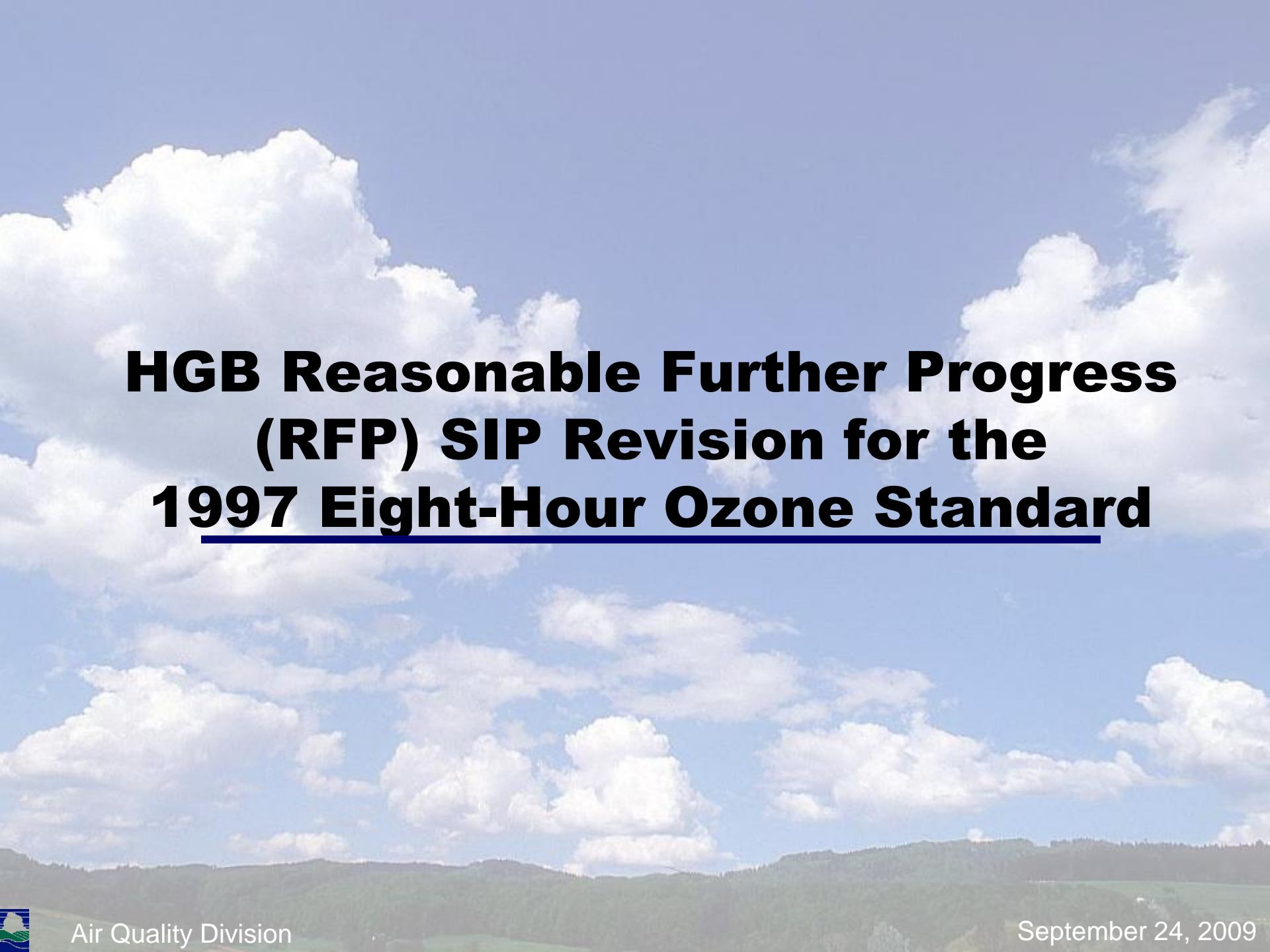
Additional Provisions

- Provision for qualified companies that made early reductions before 2006 to use alternative years for baseline emissions calculations
- Soliciting comment for additional methods for awarding credit for HRVOC controls such as flare-gas recovery, flare minimization, and fuel-stream destruction
- Soliciting comment on a proposed “flat percentage” based allocation methodology



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**HGB Reasonable Further Progress
(RFP) SIP Revision for the
1997 Eight-Hour Ozone Standard**



Proposed HGB RFP SIP Revision Overview

- HGB RFP SIP Revision
 - Satisfies FCAA requirements by documenting estimated ozone precursor reductions through 2018
 - Provides updated emissions inventories and MVEBs



Proposed RFP Demonstration

VOC	tons per day				
	2008	2011	2014	2017	2018
RFP Required Emissions	928.19	917.60	907.61	902.84	898.12
Controlled Emissions Forecast	876.09	859.03	868.02	881.15	887.14
Excess Reductions	52.10	58.57	39.59	21.68	10.98

NO _x	tons per day				
	2008	2011	2014	2017	2018
RFP Required Emissions	722.94	643.32	573.47	499.68	478.15
Controlled Emissions Forecast	580.22	542.71	499.64	469.15	464.76
Excess Reductions	142.72	100.60	73.83	30.53	13.40



Proposed RFP MVEBs

MVEB	tons per day				
	2008	2011	2014	2017	2018
VOC	94.75	75.17	61.84	53.23	51.35
NO _x	193.39	135.74	95.26	67.95	60.92



Contact Information

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Public Comment Information



How to Submit Comments

- Electronic comments may be submitted at www5.tceq.state.tx.us/rules/ecomments
- Comments may be submitted to:
 - Jessica Rawlings, Texas Register Team
 - Office of Legal Services, MC 205
 - Texas Commission on Environmental Quality
 - P.O. Box 13087
 - Austin, Texas 78711-3087
- Comments may be faxed to (512) 239-4808.
- Comment period opens October 9, 2009.
- Comments must be received by November 9, 2009.



How to Submit Comments

- All comments should reference the rule or SIP project number to which the comment pertains.
 - Rule Project Number 2009-019-101-EN for the proposed MECT rule amendments
 - Rule Project Number 2009-006-101-EN for the proposed HRVOC rule amendments
 - Rule Project Number 2008-019-115-EN for the proposed VOC rule amendments
 - SIP Project Number 2009-017-SIP-NR for the proposed HGB Attainment Demonstration SIP revision
 - 2009-018-SIP-NR for the proposed HGB RFP SIP revision



Web Addresses

- Copies of the proposed rule revisions can be obtained from the commission's Web site at http://www.tceq.state.tx.us/nav/rules/propose_adopt.html
- Copies of the proposed SIP revisions and all appendices can be obtained from the commission's Web site at <http://www.tceq.state.tx.us/implementation/air/sip/hgb.html>