

**2018 Future Year Matrix Modeling
with 2006 Baseline Year
NO_x, VOC and NO_x + VOC Reductions**

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SETPMTC

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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 RRF to predict future design values

Future Base Case

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

Control Strategy Testing

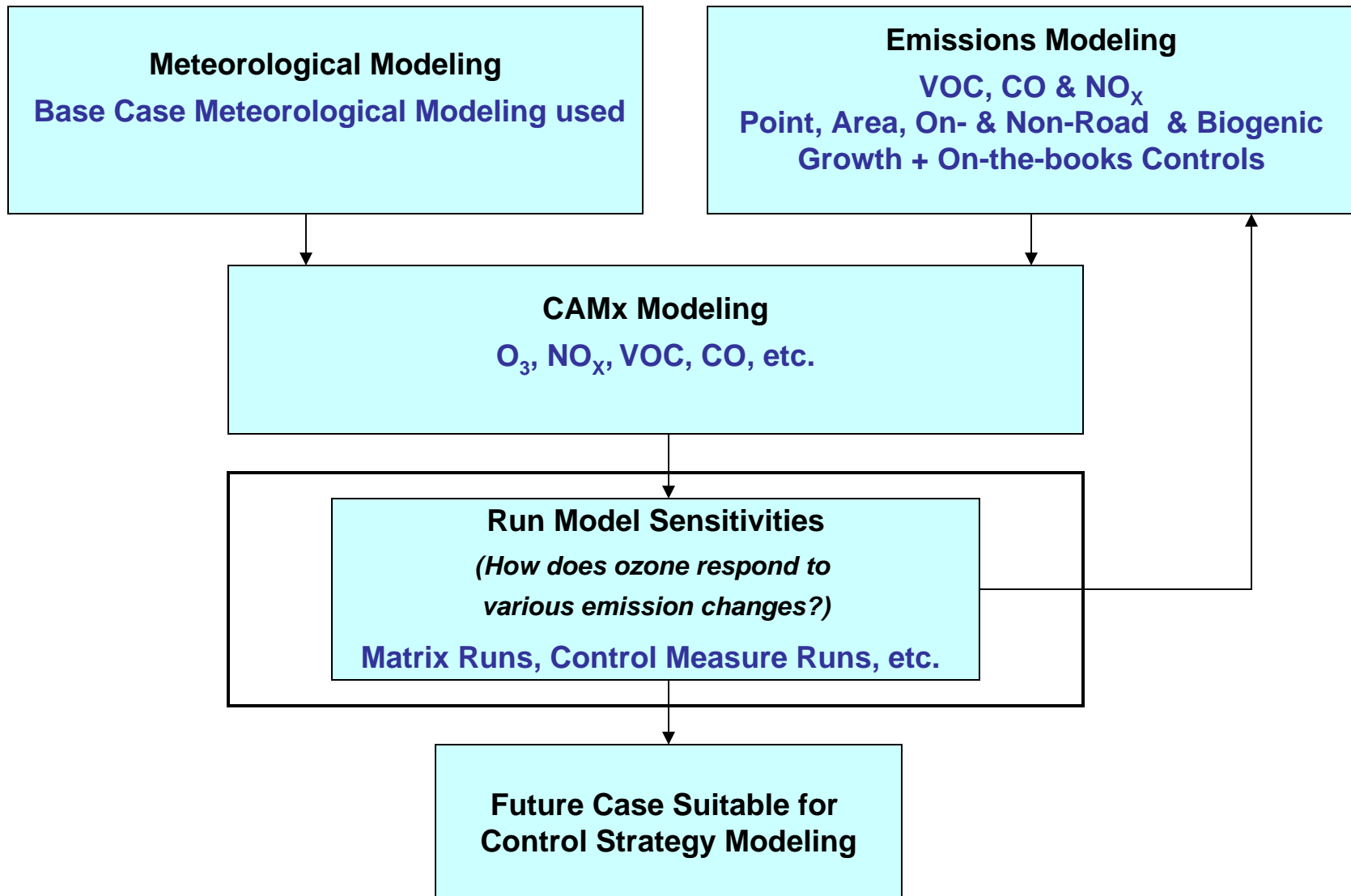
Determine control strategies that will
effectively reduce ozone

SIP

Document modeling procedures

CAMx Ozone Modeling in SIP Development

Future Case – Future Baseline Emissions



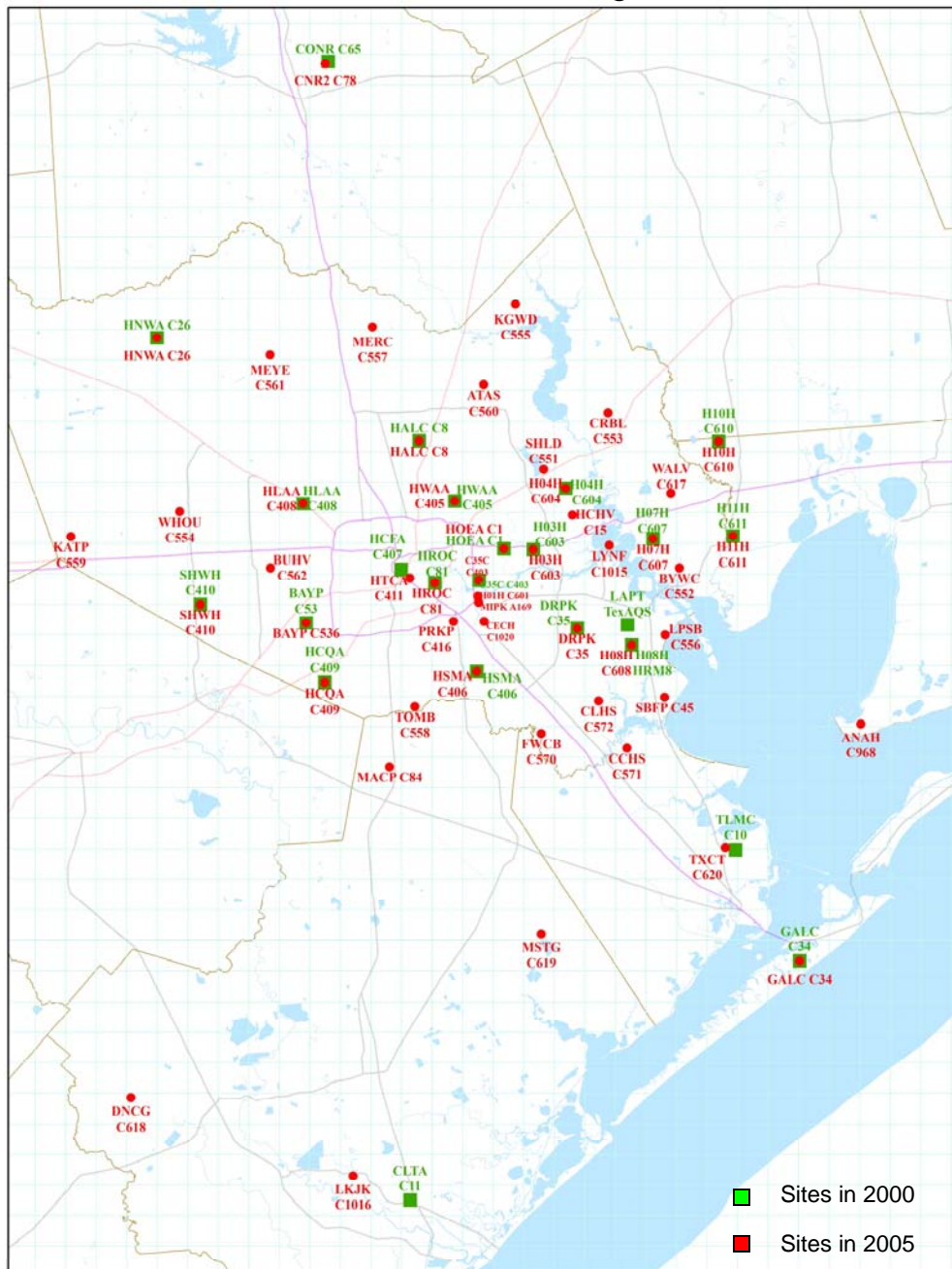
2018 Future Modeling Using 2006 Baseline

Three monitoring sites with future eight-hour ozone design values (DV_{18s}) ≥ 85 ppb

Site Code	DV_{06} (ppb)	RRF	DV_{18} (ppb)
BAYP	96.7	0.900	87.0
DRPK	92.0	0.958	88.1
WALV*	92.0	0.959	88.3

* WALV is not a regulatory monitor

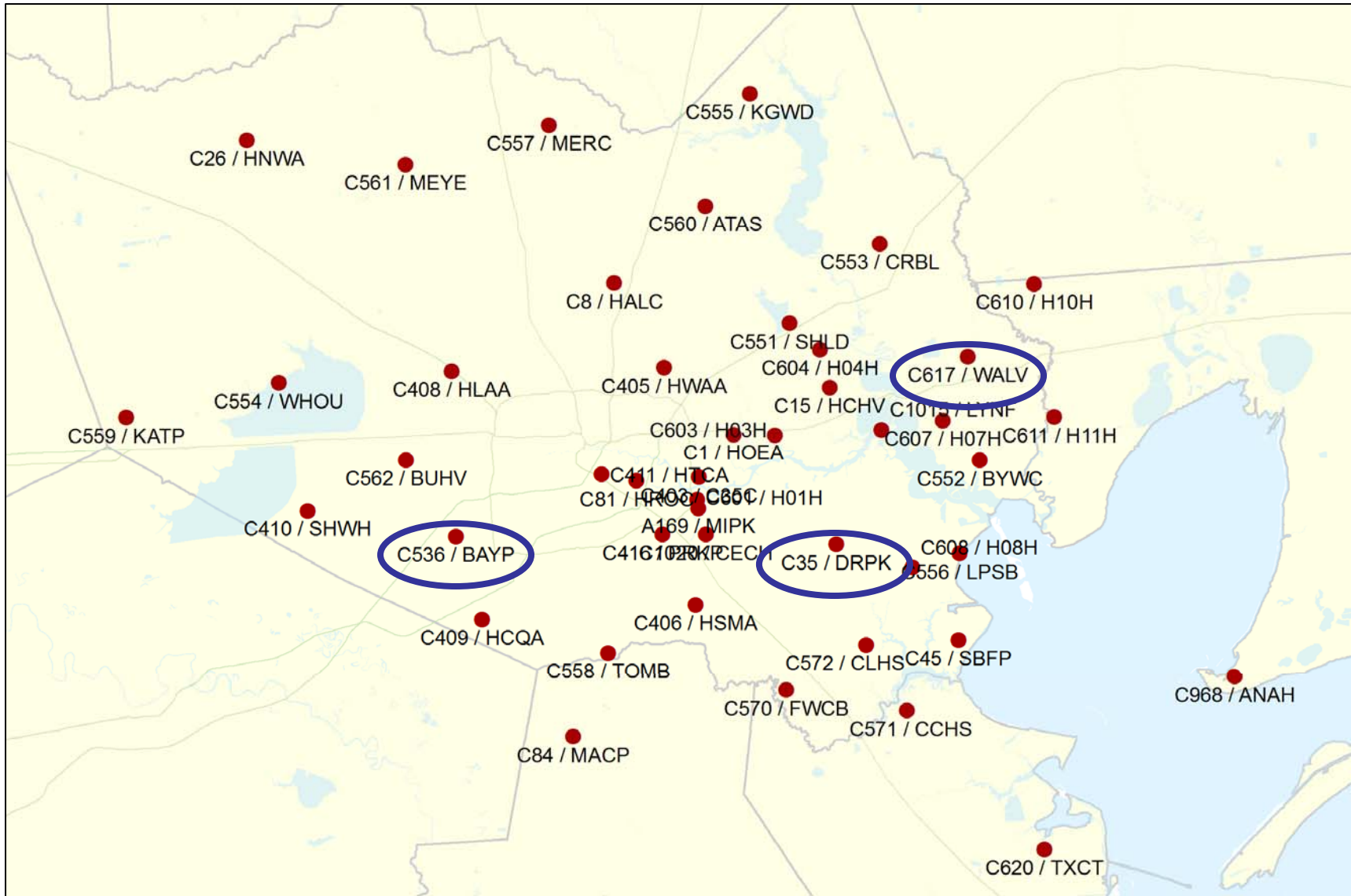
HGB Ozone Monitoring Sites



Site Code	Selected Site Name
BAYP	Bayland Park, Harris Co., TX
C35C	Clinton, Harris Co., TX
CNR2	Conroe Relocated, Montgomery Co., TX
DRPK	Deer Park, Harris Co., TX
GALC*	Galveston, Galveston Co., TX
H03H*	HRM-3, Haden Road, Harris Co., TX
H08H*	HRM Site 8, La Porte, Harris Co., TX
H10H*	HRM-10, Mt Belvieu, Chambers Co., TX
H11H*	HRM-11, , Chambers Co., TX
HALC	Aldine, Houston, Harris Co., TX
HCHV	Channelview, Houston, Harris Co., TX
HCQA	Croquet, Houston, Harris Co., TX
HNWA	NW Harris, Tomball, Harris Co., TX
HOEA	Houston East, Houston, Harris Co., TX
HROC	Houston Regional Office, Harris Co., TX
HSMA	Swiss and Monroe,, Harris Co., TX
HTCA	Texas Avenue, Houston, Harris Co., TX
HWAA	North Wayside, Houston, Harris Co., TX
LYNF	Lynchburg Ferry, Harris Co., TX
MACP	Manvel Croix Park, Brazoria Co., TX
MSTG*	Mustang Bayou, Brazoria Co., TX
SBFP	Seabrook Friendship Park, Harris Co., TX
SHWH	Westhollow, Houston, Harris Co., TX
TXCT*	Texas City, Galveston Co., TX
WALV*	Wallisville Road, Harris Co., TX

* Non-Regulatory Sites

Air Quality Monitoring Sites in the HGB Area



2018 Matrix Modeling

- Matrix modeling consists of CAMx runs using various NO_x and VOC “across-the-board” anthropogenic emission reduction scenarios (e.g., 25%, 50%, etc.)
- Matrix modeling results are used to develop ozone DV₁₈s versus emission reduction response curves
- The response curves are used to estimate the amount of emissions reduction needed for attainment

NO_x and VOC Emissions by Source Category Eight-County HGB Area

Reduction Percent	Source Category	NO _x (tpd) Modeled	VOC (tpd) Modeled
0.0%	Point Sources	163	310
	AR/NR Sources	163	716
	On-Road sources	50.8	50.4
	Total Emissions	377	1076
25.0%	Point Sources	122	232
	AR/NR Sources	123	537
	On-Road Sources	38.1	37.8
	Total Emissions	283	807
50.0%	Point Sources	81	155
	AR/NR Sources	82	358
	On-Road Sources	25.4	25.2
	Total Emissions	188	538

Matrix Modeling: 2018 Future Projected Ozone Design Values

Matrix Scenario	Projected DV _{18s} (ppb) by Monitoring Site		
	BAYP	DRPK	*WALV
100n100v	87.0	88.1	88.3
100n075v	85.9	86.1	86.8
100n050v	84.6	83.9	85.2
075n100v	81.5	84.0	84.3
050n100v	74.6	77.5	78.4
075n075v	80.8	82.5	83.1
050n050v	73.7	75.4	76.8

* WALV is not a Regulatory Monitor

Matrix Modeling: 2018 Future Projected Ozone Design Values

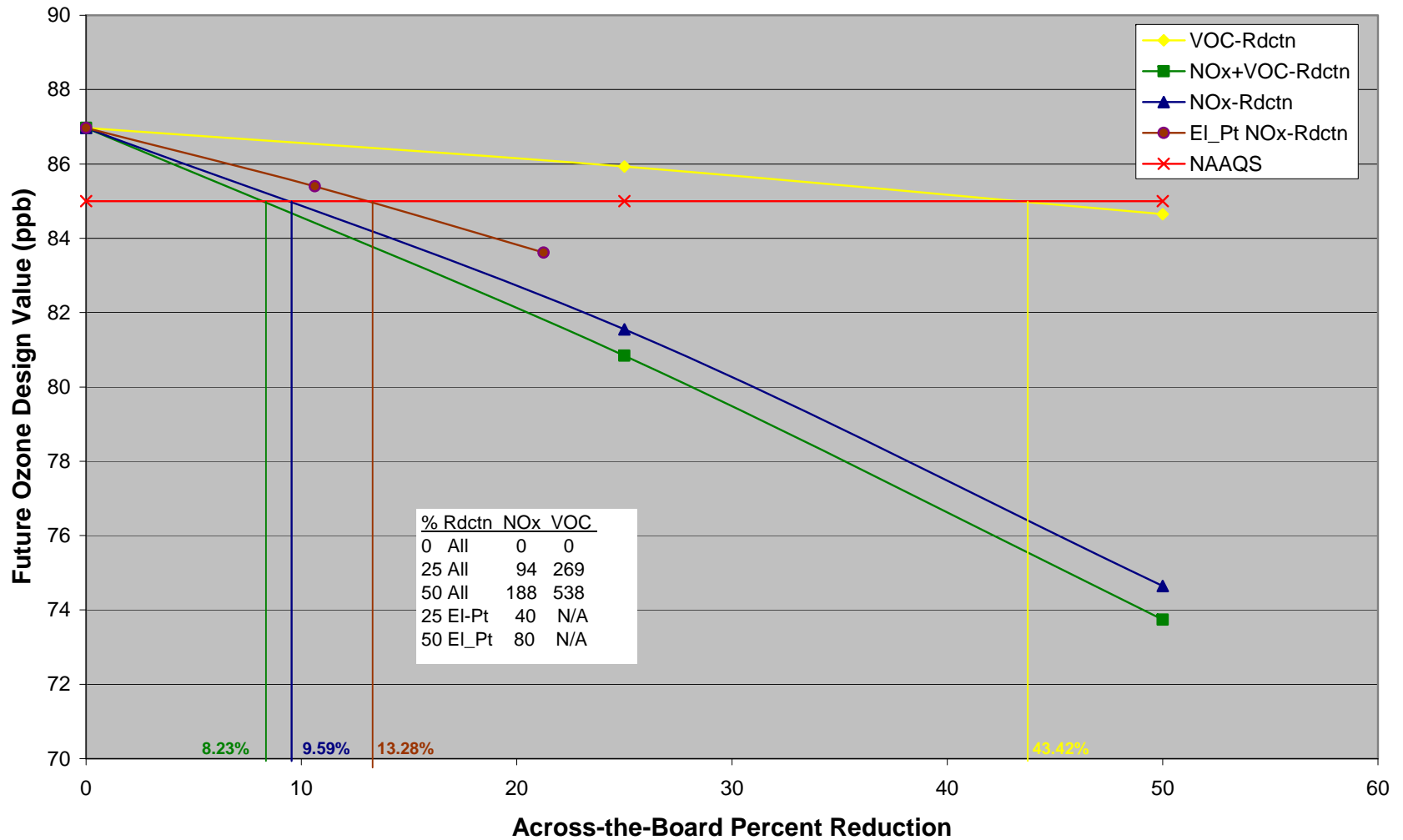
(Elevated Point Source NO_x = 160 tpd)

Matrix Scenario	Projected DV _{18s} (ppb) by Monitoring Site		
	BAYP	DRPK	*WALV
100nEI_Pt	87.0	88.1	88.3
075nEI_Pt	85.4	86.3	86.3
050nEI_Pt	83.6	83.6	83.7

* WALV is not a Regulatory Monitor

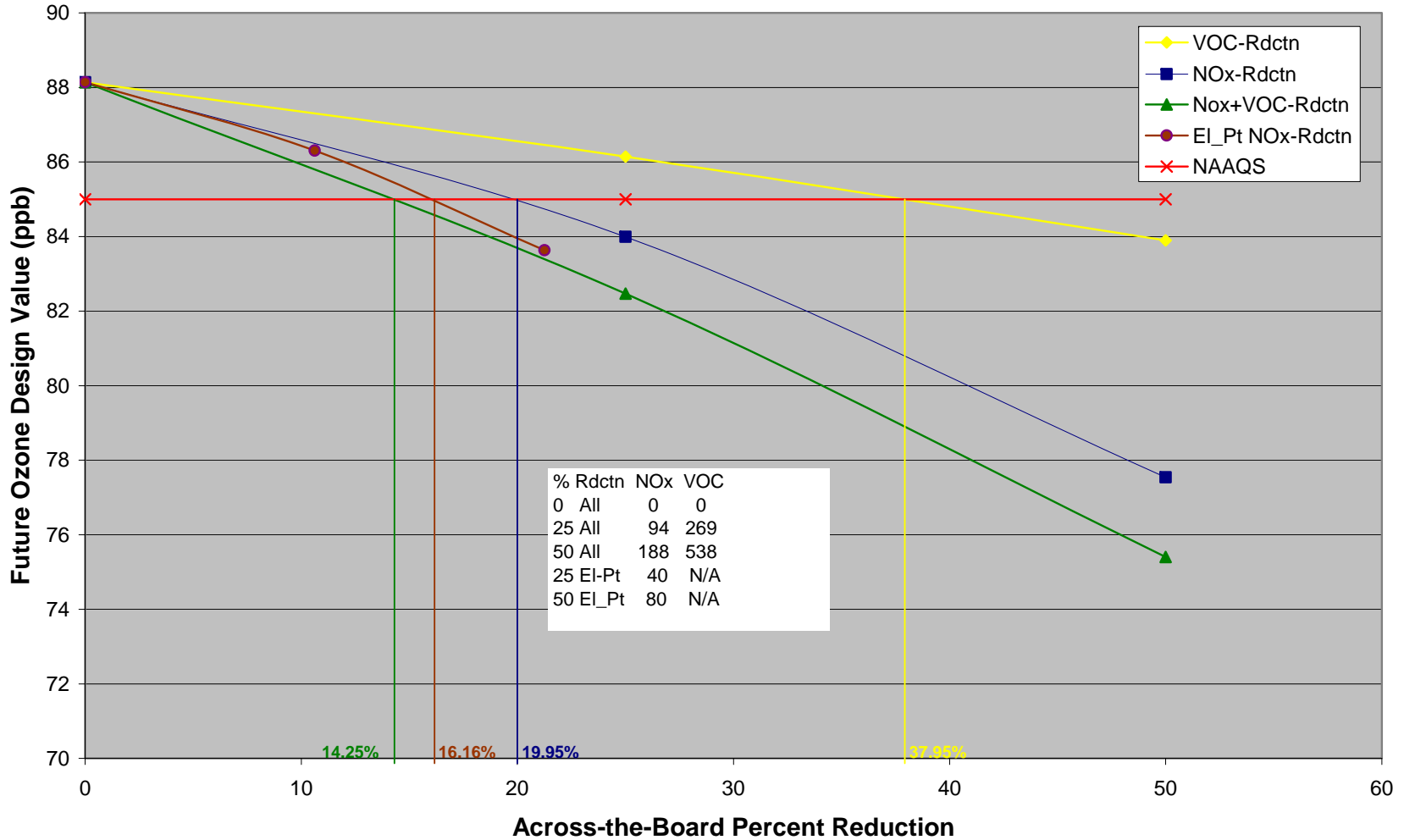
Eight-Hour Ozone Response Curves

Bayland Park Future Ozone Design Value Response: NOx, VOC & NOx+VOC Reductions



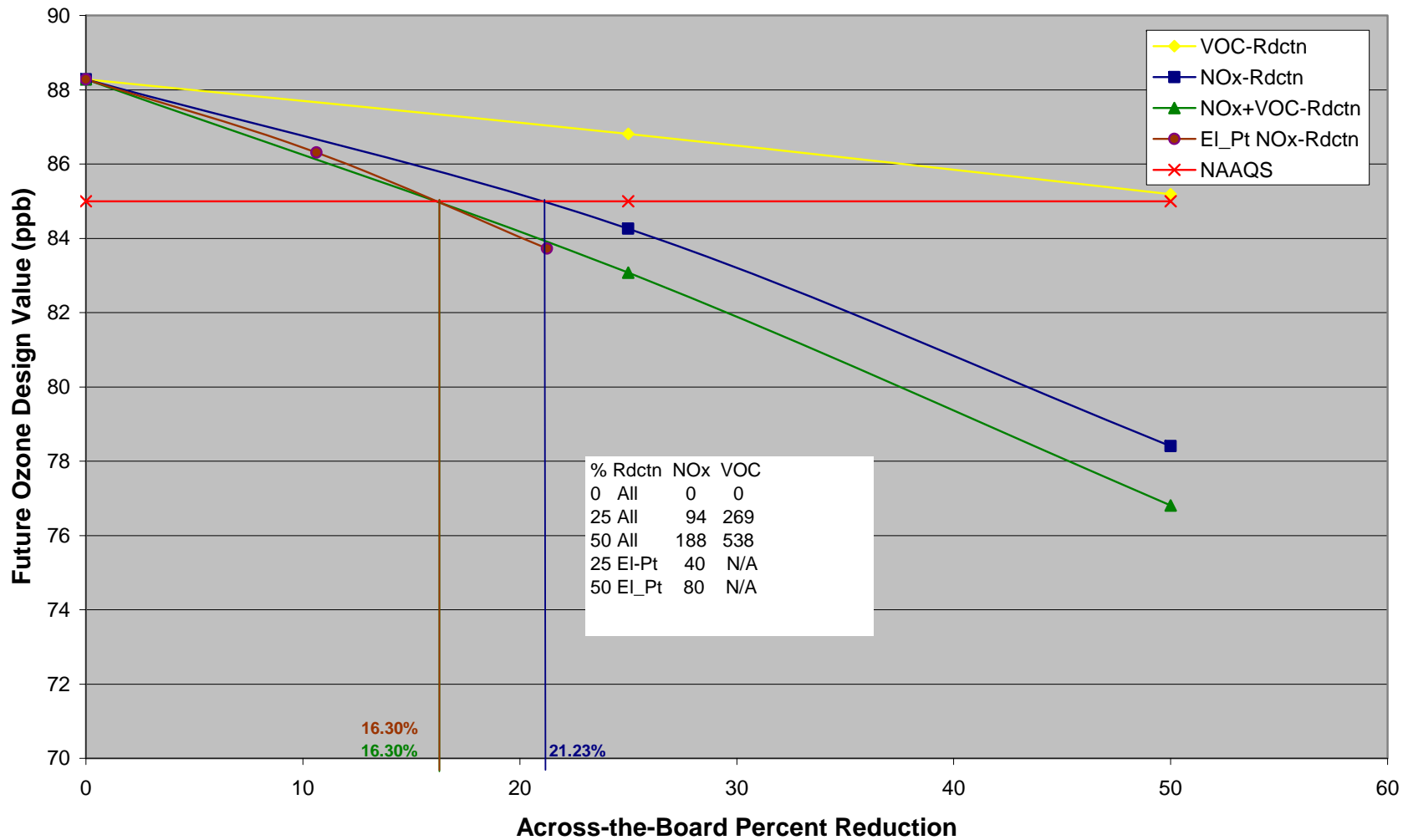
Eight-Hour Ozone Response Curves

Deer Park Future Ozone Design Value Response: NOx, VOC & NOx+VOC Reductions



Eight-Hour Ozone Response Curves

Wallisville Road Future Ozone Design Value Responce: NOx, VOC & NOx+VOC Reductions



Matrix Modeling: 2018 Future Projected Emission Reductions in Eight-County HGB Area Needed to Model Attainment

Monitoring Site Code	All_VOC Reduction (tpd)	All_NO_x Reduction (tpd)	All VOC+NO_x Reduction (tpd)	El-Point NO_x Reduction (tpd)
BAYP – C53	467	36.2	88.6V+31.0N	50.1
DRPK – C35	408	75.2	153V+53.7N	60.9
WALV – C617	> 538	80.0	175V+61.5	61.5

Summary

- The matrix modeling of emission reductions resulted in decreases in the projected DV₁₈s at all three monitors
- The response of the DV₁₈s was greatest for the NO_x + VOC reduction and least for the VOC-only reduction
- The response of the DV₁₈s for NO_x-only reductions from all sources was almost as much as the response for NO_x + VOC emission reductions
- With approximately 21 percent NO_x-only reductions from all sources (80 tpd), all three monitors are projected to be in attainment
- With approximately 16 percent NO_x-only reductions (60 tpd) from elevated point sources, all three monitors are projected to be in attainment

Summary, continued

- Approximately 8 percent combined reduction in NO_x (31 tpd) and VOC (89 tpd) from all sources would be needed for BAYP to reach a DV₁₈ of 85 ppb
- Approximately 14 percent combined reduction in NO_x (54 tpd) and VOC (153 tpd) from all sources would be needed for DRPK to reach a DV₁₈ of 85 ppb
- Approximately 16 percent combined reduction in NO_x (61 tpd) and VOC (175 tpd) would be needed for WALV to reach a DV₁₈ of 85 ppb

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