



# Update on DFW Design Value Calculations

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# DFW Model Performance

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EPA has two basic principles for model performance evaluation:

1. How well the model is able to replicate observed concentrations of ozone
2. How accurate the model is in characterizing the response to changes in emissions

EPA has shown that ozone modeling is not responsive when the base case modeled ozone is less than 70 ppb.



# EPA Future DV Calculations

Design value scaling calculation/ EPA Method										
Base Case: run46										
Site	990815	990816	990817	990818	990819	990820	990821	990822	Average	#Days>70
Frisco	81.3	107.0	102.6	109.2	86.0	69.9	87.1	89.5	94.7	7
Dallas C60	83.1	99.8	103.4	103.8	99.2	78.0	85.5	85.3	92.3	8
North Dallas C63	82.6	101.3	102.6	106.6	96.5	76.4	86.8	88.4	92.6	8
Dallas C402	77.0	93.3	98.5	96.6	107.4	83.7	79.4	79.5	89.4	8
Denton	102.6	113.1	110.0	112.5	84.7	73.1	101.6	99.6	99.7	8
Midlothian	78.3	86.1	85.9	76.2	114.0	88.8	75.7	76.7	85.2	8
Arlington	86.2	98.4	100.2	95.2	106.9	83.1	81.9	86.7	92.3	8
Fort Worth C13	93.8	105.5	104.3	106.0	96.0	80.1	89.8	92.0	95.9	8
Fort Worth C17	101.1	111.1	110.4	108.3	92.4	78.6	95.9	94.9	99.1	8
Future Year: run46.fy2009.a2.dfw_lo_combo4										
Site	990815	990816	990817	990818	990819	990820	990821	990822	Average	EPA RRF
Frisco	65.5	99.5	100.9	99.2	72.3	63.7	73.3	72.8	83.4	0.880
Dallas C60	70.8	91.4	102.5	96.2	90.4	80.6	76.3	72.5	85.1	0.922
North Dallas C63	69.0	94.3	100.9	98.1	83.3	77.2	74.5	72.5	83.7	0.904
Dallas C402	65.2	80.5	88.0	83.0	95.5	84.6	69.1	69.3	79.4	0.888
Denton	86.2	101.8	106.8	90.6	70.6	64.0	88.3	81.8	86.3	0.866
Midlothian	69.0	75.4	78.1	70.1	97.2	84.9	67.9	69.5	76.5	0.898
Arlington	71.4	86.0	88.7	80.0	94.1	84.6	71.5	76.3	81.6	0.884
Fort Worth C13	76.9	91.5	92.3	86.6	82.3	75.2	77.6	77.9	82.5	0.861
Fort Worth C17	87.3	96.7	102.8	89.1	78.0	70.3	86.8	80.5	86.4	0.873



EPA method: Take the average first, then the ratio.



# Daily Future DV Calculations

Design value scaling calculation/										
Base Case: run46										
Site	990815	990816	990817	990818	990819	990820	990821	990822	Average	#Days>70
Frisco	81.3	107.0	102.6	109.2	86.0	69.9	87.1	89.5	94.7	7
Dallas C60	83.1	99.8	103.4	103.8	99.2	78.0	85.5	85.3	92.3	8
North Dallas C63	82.6	101.3	102.6	106.6	96.5	76.4	86.8	88.4	92.6	8
Dallas C402	77.0	93.3	98.5	96.6	107.4	83.7	79.4	79.5	89.4	8
Denton	102.6	113.1	110.0	112.5	84.7	73.1	101.6	99.6	99.7	8
Midlothian	78.3	86.1	85.9	76.2	114.0	88.8	75.7	76.7	85.2	8
Arlington	86.2	98.4	100.2	95.2	106.9	83.1	81.9	86.7	92.3	8
Fort Worth C13	93.8	105.5	104.3	106.0	96.0	80.1	89.8	92.0	95.9	8
Fort Worth C17	101.1	111.1	110.4	108.3	92.4	78.6	95.9	94.9	99.1	8
Future Year: run46.fy2009.a2.dfw_lo_combo4										
Site	990815	990816	990817	990818	990819	990820	990821	990822	Average	EPA RRF
Frisco	65.5	99.5	100.9	99.2	72.3	63.7	73.3	72.8	83.4	0.880
Dallas C60	70.8	91.4	102.5	96.2	90.4	80.6	76.3	72.5	85.1	0.922
North Dallas C63	69.0	94.3	100.9	98.1	83.3	77.2	74.5	72.5	83.7	0.904
Dallas C402	65.2	80.5	88.0	83.0	95.5	84.6	69.1	69.3	79.4	0.888
Denton	86.2	101.8	106.8	90.6	70.6	64.0	88.3	81.8	86.3	0.866
Midlothian	69.0	75.4	78.1	70.1	97.2	84.9	67.9	69.5	76.5	0.898
Arlington	71.4	86.0	88.7	80.0	94.1	84.6	71.5	76.3	81.6	0.884
Fort Worth C13	76.9	91.5	92.3	86.6	82.3	75.2	77.6	77.9	82.5	0.861
Fort Worth C17	87.3	96.7	102.8	89.1	78.0	70.3	86.8	80.5	86.4	0.873

Daily method: Take ratio first, then the average.



# Daily RRF Calculations

Daily RRFs Adjusted for Low Base Case Ozone									Adjusted	Base Case
Site	990815	990816	990817	990818	990819	990820	990821	990822	Avg RRF	DV [ppb]
Frisco	0.805	0.929	0.983	0.909	0.841	1.034	0.842	0.813	0.875	100.3
Dallas C60	0.852	0.916	0.991	0.927	0.911	1.034	0.893	0.850	0.922	92.0
North Dallas C63	0.835	0.931	0.983	0.920	0.864	1.011	0.859	0.820	0.903	93.0
Dallas C402	0.847	0.862	0.893	0.859	0.889	1.011	0.871	0.871	0.888	87.3
Denton	0.840	0.900	0.970	0.805	0.834	0.875	0.869	0.820	0.864	101.5
Midlothian	0.881	0.876	0.909	0.920	0.852	0.956	0.897	0.907	0.900	92.5
Arlington	0.828	0.874	0.885	0.841	0.880	1.018	0.873	0.880	0.885	95.0
Fort Worth C13	0.820	0.867	0.885	0.818	0.857	0.939	0.864	0.847	0.862	98.3
Fort Worth C17	0.864	0.870	0.932	0.823	0.844	0.895	0.905	0.849	0.873	96.3

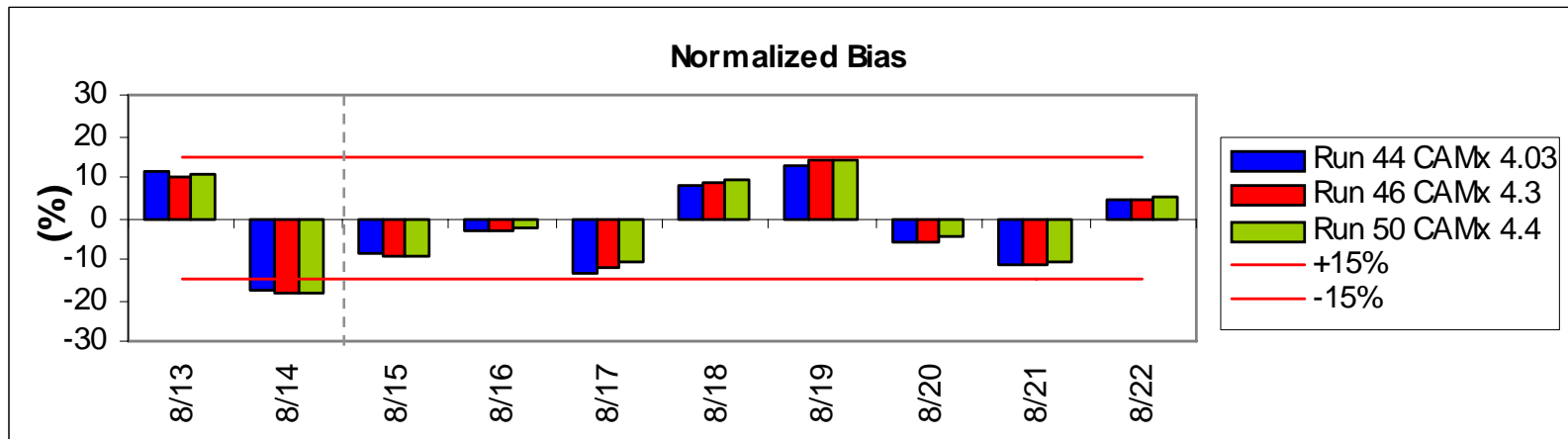
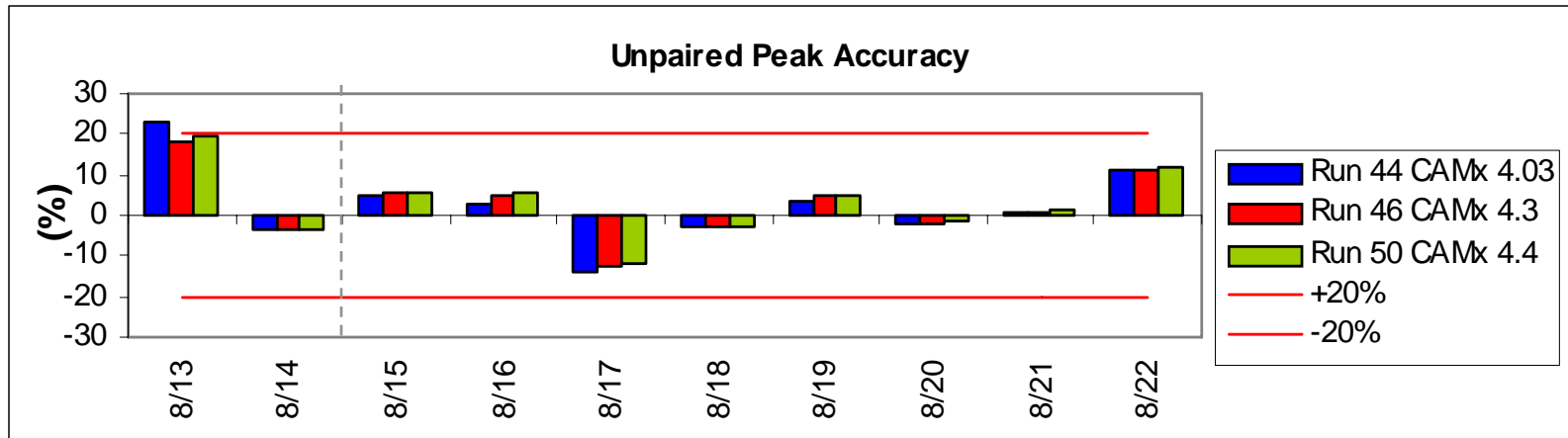
Daily RRFs tell us a lot about daily model performance at each site

- Blue indicates relatively strong response (RRF <.900)
- Black indicates moderate response (RRF .900-.999)
- Red indicates that Ozone increased (RRF >1.000)



# 1999 Baseline Model Performance

Testing different CAMx versions with new a2 inventory





# Future Design Values

(with controls)

Monitor	2009 Design Values	Daily RRF 2009 Design Values
Frisco C31	88.3	87.7
Hinton C60	84.8	84.8
Dallas N C63	84.1	84.0
Redbird C402	77.5	77.5
Denton C56	87.9	87.7
Midlothian C94	83.1	83.2
Arlington C57	84.0	84.1
FtW NW C13	84.6	84.7
FtW Keller C17	84.1	84.0

