

OTC 8-Hour Ozone SIP Modeling Update

OTC Modeling Committee
June 6, 2006

Presentation Topics

1. OTC Ozone SIP Modeling Platform
2. 2009 OTB/OTW CMAQ Simulation Results
3. OTC CMAQ Sensitivity Simulations
4. Next Steps

1. OTC Ozone SIP Modeling Platform

Background

- NYDEC set up the Ozone SIP modeling platform utilizing CMAQ to perform simulations.
- UMD with support from MDE developed the meteorological fields for 2002 using MM5.
- In consultation with States, OTC is working with contractor and MARAMA to prepare base year (2002) and future years (2009/12/18) emission files.

36km and 12km Modeling Domains



2. 2009 OTB/OTW CMAQ Simulation (Version 2 Emissions)

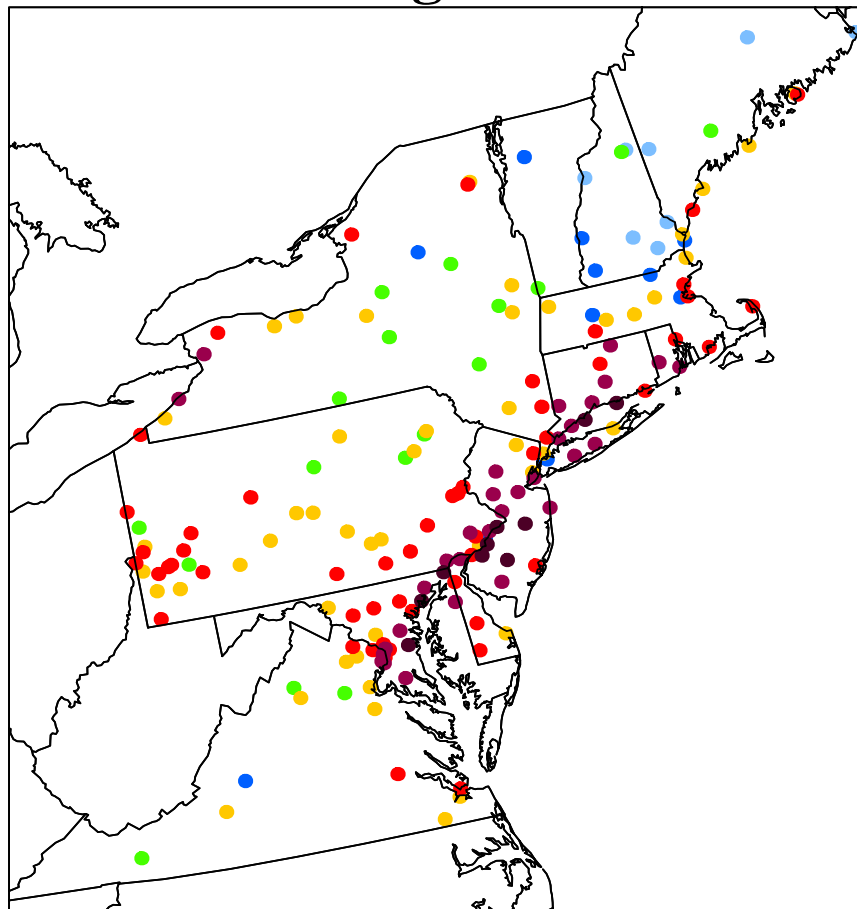
2009: OTB/OTW Control Programs

On the Books/On the Way including...

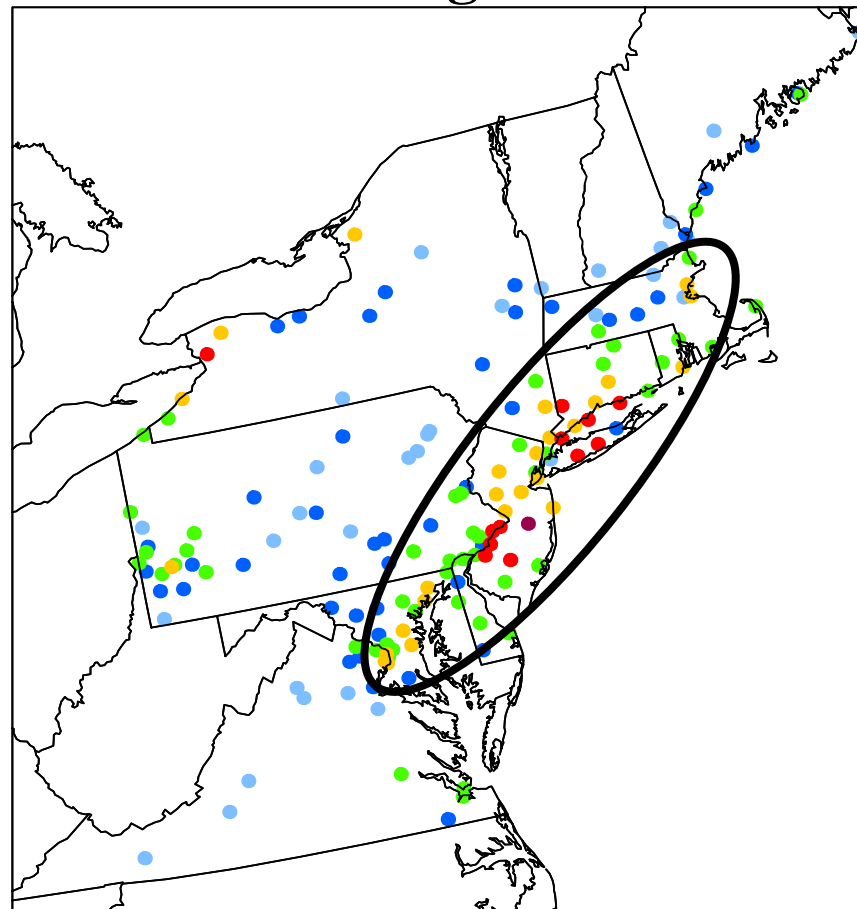
- NO_x SIP Call, CAIR, State multi-P rules
- Federal on-road and off-road fuels, vehicle standards, LEV programs (where applicable)
- Federal MACT rules
- OTC model rules for Consumer Products
AIM, DG, etc.
- Other state-specific rules in effect by 2009

OTR Domain

2002 Design Values



2009 Design Values



72

77

82

87

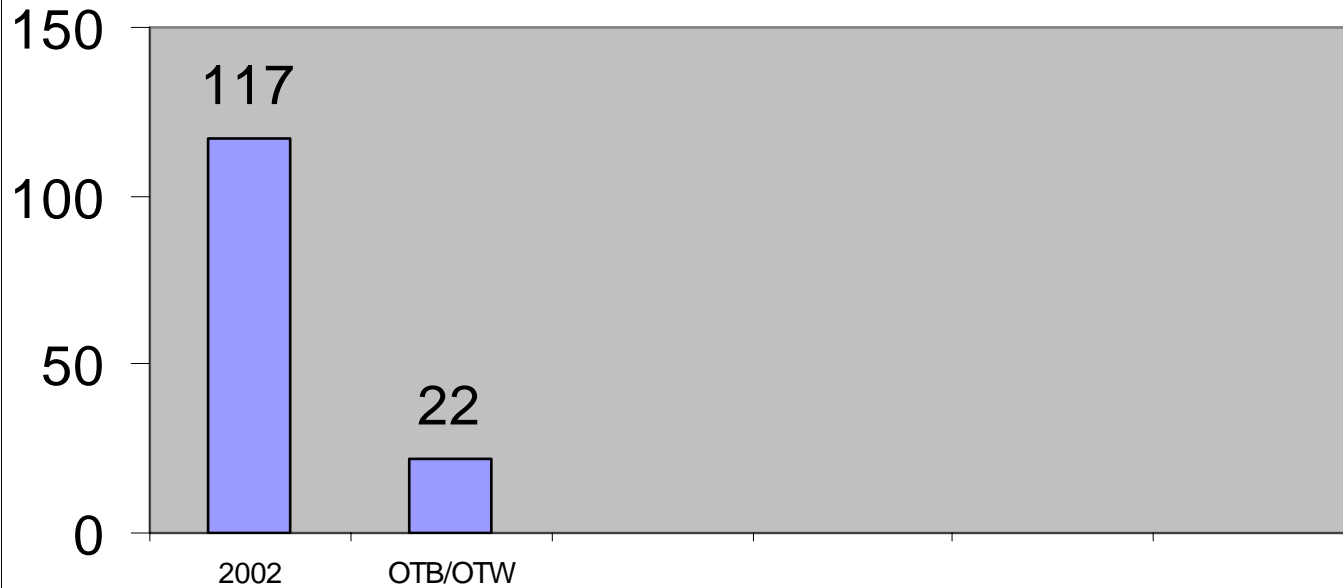
92

97

Findings for 2009 OTB/OTW Run

- Future Design Values over the OTR exhibit attainment with the exception of the OTR inner corridor and Buffalo-Niagara area of New York State.
- Future design values > 90 ppb are predicted for coastal areas of Connecticut, New York (Long Island), and New Jersey.
- A substantial portion of the monitors in the OTR inner corridor region are between 82 to 87 ppb. To demonstrate attainment at these locations, the EPA requires a strong weight of evidence (WOE) analysis supporting that these monitors would be at or below the level of 8-hr ozone NAAQS.

**Ozone Monitors Greater than 84.9 ppb
for OTC CMAQ OTB/OTW Simulations
(174 ozone monitors in OTR)**



3. OTC CMAQ Sensitivity Simulations (Version 2 Emissions)

OTC Sensitivity Runs

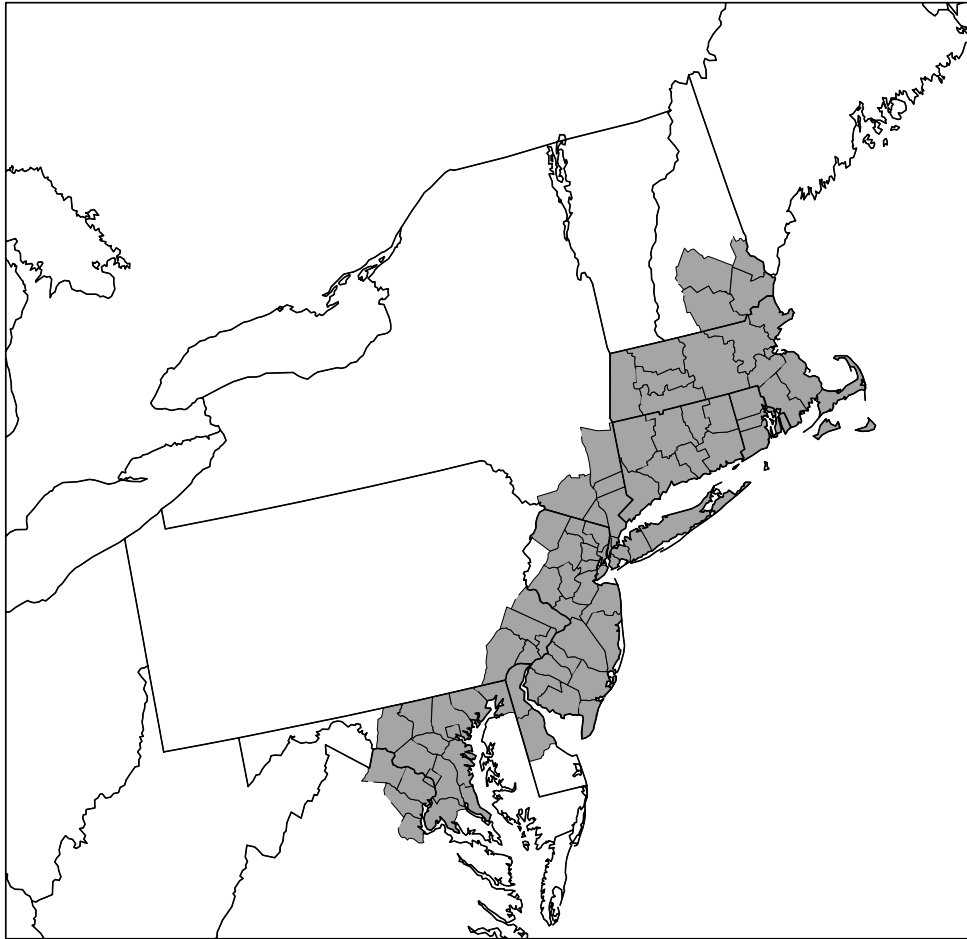
- Local One 2009 OTB/OTW plus viable local controls for area and non-EGU sources in OTR and MRPO states
- Local Two 2009 OTB/OTW plus viable local controls for area and non-EGU sources in OTR, MRPO and VISTAS states.

Local Controls consist of Consumer Products, Portable Gas Containers, Asphalt Paving, Cement Kilns, Glass Furnaces ICI Boilers, Architectural and Industrial Maintenance (AIM) Coatings

OTC Sensitivity Runs (continued)

- Early CAIR 2009 OTB/OTW domain-wide with 2018 CAIR EGU emissions replacing 2009 EGU emissions in the entire modeling domain.
- 30% Run 2009 OTB/OTW domain-wide
 - plus additional 30% reduction in NO_x, VOC and CO in the inner corridor of OTR (except for mobile)
 - plus 30% reduction in NO_x, VOC and CO from EGU sources domain-wide (except Canada)

Counties in the Inner Corridor of OTR



ST	County	Station	2002 ¹	OTB/OTW ²				
NJ	Ocean	Colliers Mills	106.0	92.9				
CT	Fairfield	Stratford	98.3	91.4				
CT	New Haven	Madison	98.3	90.6				
NY	Suffolk	Holtsville	97.0	90.3				
PA	Bucks	Bristol	99.0	89.6				
NJ	Camden	Ancora St. Hos	100.7	89.1				
NJ	Camden	Camden	98.3	89.0				
CT	Fairfield	Greenwich	95.7	88.7				
PA	Philadelphia	Northeast	96.7	87.9				
NJ	Gloucester	Clarksboro	98.3	87.8				
NY	Erie	Amherst	95.7	87.4				
CT	Fairfield	Danbury	95.7	87.2				
NY	Suffolk	Babylon	93.7	87.2				
CT	Fairfield	Westport	94.0	87.0				
NY	Niagara	Middleport	91.7	86.9				
NJ	Mercer	Rider Univ.	97.0	86.8				
NY	Westchester	White Plains	91.3	86.6				
CT	New Haven	Hamden	93.3	86.3				
CT	Middlesex	Middletown	95.7	86.2				
NJ	Bergen	Teaneck	91.7	86.2				
VA	Arlington	Arlington Co.	96.7	85.6				
MD	Harford	Edgewood	100.3	85.2				
MA	Essex	Lynn	90.0	84.9				
VA	Fairfax	Fairfax Co.	96.7	84.8				
NY	Jefferson	Perch River	91.3	84.7				
NY	Richmond	Susan Wagner	93.0	84.6				
NJ	Morris	Chester	95.3	84.4				
NJ	Monmouth	Monmouth Univ.	95.7	84.3				
NJ	Middlesex	Rutgers Univ.	96.0	84.1				
NJ	Hunterdon	Flemington	95.3	83.9				
MD	Anne Arundel	Davidsonville	98.0	83.4				
MD	Anne Arundel	Ft. Meade	97.0	83.2				
VA	Fairfax	Fairfax Co.	94.7	83.1				
RI	Washington	EPA Lab	93.3	82.6				
NY	Chautauqua	Dunkirk	93.0	82.5				
PA	Allegheny	Pittsburgh (Ca	90.7	82.4				
MA	Suffolk	BOSTON (Long)	88.7	82.2				
NY	Putnam	Mt. Ninham	91.3	82.2				
MD	Harford	Aldino	97.0	82.1				

2009 Design Values for OTB/OTW Run (above 87 ppb WOE cutoff)

ST	County	Station	2002	OTB/OTW				
NJ	Ocean	Colliers Mills	106.0	92.9				
CT	Fairfield	Stratford	98.3	91.4				
CT	New Haven	Madison	98.3	90.6				
NY	Suffolk	Holtsville	97.0	90.3				
PA	Bucks	Bristol	99.0	89.6				
NJ	Camden	Ancora St. Hos	100.7	89.1				
NJ	Camden	Camden	98.3	89.0				
CT	Fairfield	Greenwich	95.7	88.7				
PA	Philadelphia	Northeast	96.7	87.9				
NJ	Gloucester	Clarksboro	98.3	87.8				
NY	Erie	Amherst	95.7	87.4				
CT	Fairfield	Danbury	95.7	87.2				
NY	Suffolk	Babylon	93.7	87.2				
CT	Fairfield	Westport	94.0	87.0				

2009 Design Values for Local One Run (above 87 ppb WOE cutoff)

ST	County	Station	2002	OTB/OTW	Local One			
NJ	Ocean	Colliers Mills	106.0	92.9	92.0			
CT	Fairfield	Stratford	98.3	91.4	90.9			
CT	New Haven	Madison	98.3	90.6	89.9			
NY	Suffolk	Holtsville	97.0	90.3	89.8			
PA	Bucks	Bristol	99.0	89.6	88.8			
NJ	Camden	Ancora St. Hos	100.7	89.1	88.2			
NJ	Camden	Camden	98.3	89.0	88.2			
CT	Fairfield	Greenwich	95.7	88.7	88.3			
PA	Philadelphia	Northeast	96.7	87.9	87.3			
NJ	Gloucester	Clarksboro	98.3	87.8	87.2			
NY	Erie	Amherst	95.7	87.4	87.0			
CT	Fairfield	Danbury	95.7	87.2	86.6			
NY	Suffolk	Babylon	93.7	87.2	86.8			
CT	Fairfield	Westport	94.0	87.0	86.5			

2009 Design Values for Early CAIR Run (above 87 ppb WOE cutoff)

ST	County	Station	2002	OTB/OTW	Local One	Early CAIR		
NJ	Ocean	Colliers Mills	106.0	92.9	92.0	92.4		
CT	Fairfield	Stratford	98.3	91.4	90.9	90.6		
CT	New Haven	Madison	98.3	90.6	89.9	89.3		
NY	Suffolk	Holtsville	97.0	90.3	89.8	89.7		
PA	Bucks	Bristol	99.0	89.6	88.8	88.9		
NJ	Camden	Ancora St. Hos	100.7	89.1	88.2	88.1		
NJ	Camden	Camden	98.3	89.0	88.2	88.1		
CT	Fairfield	Greenwich	95.7	88.7	88.3	88.1		
PA	Philadelphia	Northeast	96.7	87.9	87.3	87.5		
NJ	Gloucester	Clarksboro	98.3	87.8	87.2	87		
NY	Erie	Amherst	95.7	87.4	87.0	87.1		
CT	Fairfield	Danbury	95.7	87.2	86.6	86.7		
NY	Suffolk	Babylon	93.7	87.2	86.8	86.8		
CT	Fairfield	Westport	94.0	87.0	86.5	86.3		

2009 Design Values for OTC Local Two Run (above 87 ppb WOE cutoff)

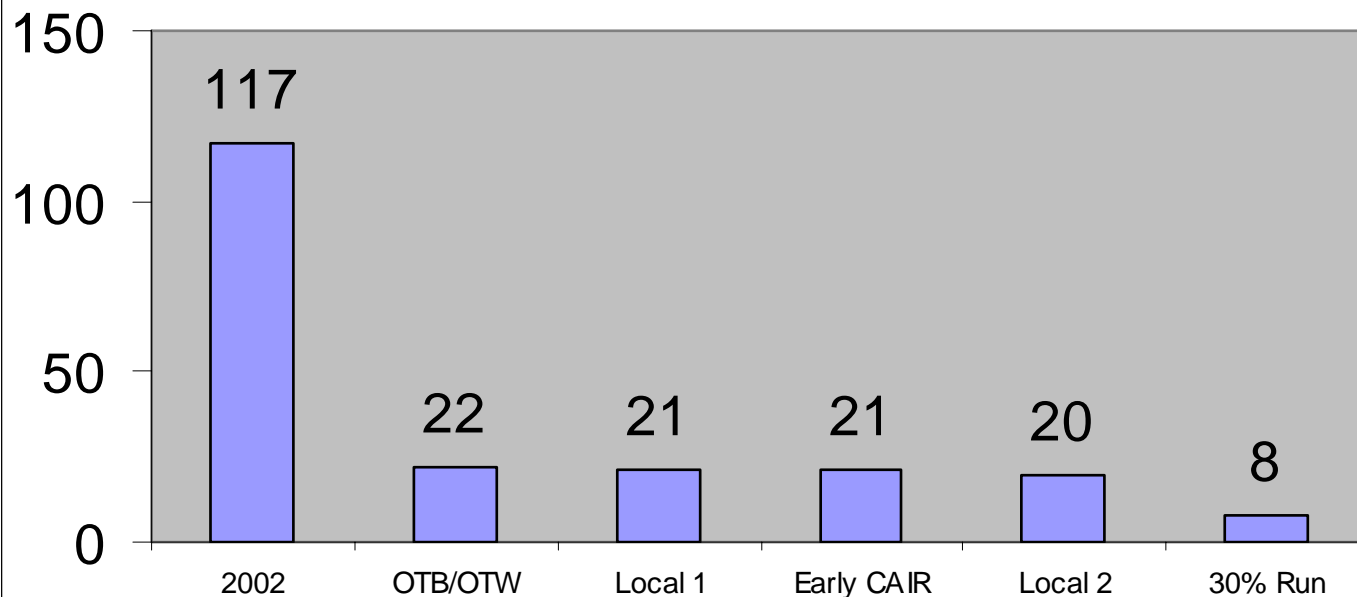
ST	County	Station	2002	OTB/OTW	Local One	Early CAIR	Local Two	
NJ	Ocean	Colliers Mills	106.0	92.9	92.0	92.4	91.9	
CT	Fairfield	Stratford	98.3	91.4	90.9	90.6	90.8	
CT	New Haven	Madison	98.3	90.6	89.9	89.3	89.9	
NY	Suffolk	Holtsville	97.0	90.3	89.8	89.7	89.7	
PA	Bucks	Bristol	99.0	89.6	88.8	88.9	88.7	
NJ	Camden	Ancora St. Hos	100.7	89.1	88.2	88.1	88.1	
NJ	Camden	Camden	98.3	89.0	88.2	88.1	88.1	
CT	Fairfield	Greenwich	95.7	88.7	88.3	88.1	88.2	
PA	Philadelphia	Northeast	96.7	87.9	87.3	87.5	87.2	
NJ	Gloucester	Clarksboro	98.3	87.8	87.2	87.0	87.1	
NY	Erie	Amherst	95.7	87.4	87.0	87.1	86.9	
CT	Fairfield	Danbury	95.7	87.2	86.6	86.7	86.5	
NY	Suffolk	Babylon	93.7	87.2	86.8	86.8	86.7	
CT	Fairfield	Westport	94.0	87.0	86.5	86.3	86.4	

2009 Design Values for OTC 30% Run (above 87 ppb WOE cutoff)

ST	County	Station	2002	OTB/OTW	Local One	Early CAIR	Local Two	30% Run
NJ	Ocean	Colliers Mills	106.0	92.9	92.0	92.4	91.9	88.4
CT	Fairfield	Stratford	98.3	91.4	90.9	90.6	90.8	87.0
CT	New Haven	Madison	98.3	90.6	89.9	89.3	89.9	85.5
NY	Suffolk	Holtsville	97.0	90.3	89.8	89.7	89.7	86.2
PA	Bucks	Bristol	99.0	89.6	88.8	88.9	88.7	85.6
NJ	Camden	Ancora St. Hos	100.7	89.1	88.2	88.1	88.1	84.8
NJ	Camden	Camden	98.3	89.0	88.2	88.1	88.1	85.3
CT	Fairfield	Greenwich	95.7	88.7	88.3	88.1	88.2	84.8
PA	Philadelphia	Northeast	96.7	87.9	87.3	87.5	87.2	84.4
NJ	Gloucester	Clarksboro	98.3	87.8	87.2	87	87.1	84.3
NY	Erie	Amherst	95.7	87.4	87.0	87.1	86.9	86.4
CT	Fairfield	Danbury	95.7	87.2	86.6	86.7	86.5	82.5
NY	Suffolk	Babylon	93.7	87.2	86.8	86.8	86.7	83.7
CT	Fairfield	Westport	94.0	87.0	86.5	86.3	86.4	82.8

ST	County	Station	2002 ¹	OTB/OTW ²	Local One ³	Early EGU ⁵	Local Two ⁴	30% run ⁶
NJ	Ocean	Colliers Mills	106.0	92.9	92.0	92.4	91.9	88.4
CT	Fairfield	Stratford	98.3	91.4	90.9	90.6	90.8	87.0
CT	New Haven	Madison	98.3	90.6	89.9	89.3	89.9	85.5
NY	Suffolk	Holtsville	97.0	90.3	89.8	89.7	89.7	86.2
PA	Bucks	Bristol	99.0	89.6	88.8	88.9	88.7	85.6
NJ	Camden	Ancora St. Hos	100.7	89.1	88.2	88.1	88.1	84.8
NJ	Camden	Camden	98.3	89.0	88.2	88.1	88.1	85.3
CT	Fairfield	Greenwich	95.7	88.7	88.3	88.1	88.2	84.8
PA	Philadelphia	Northeast	96.7	87.9	87.3	87.5	87.2	84.4
NJ	Gloucester	Clarksboro	98.3	87.8	87.2	87.0	87.1	84.3
NY	Erie	Amherst	95.7	87.4	87.0	87.1	86.9	86.4
CT	Fairfield	Danbury	95.7	87.2	86.6	86.7	86.5	82.5
NY	Suffolk	Babylon	93.7	87.2	86.8	86.8	86.7	83.7
CT	Fairfield	Westport	94.0	87.0	86.5	86.3	86.4	82.8
NY	Niagara	Middleport	91.7	86.9	86.5	86.8	86.5	86.3
NJ	Mercer	Rider Univ.	97.0	86.8	86.2	86.5	86.1	83.1
NY	Westchester	White Plains	91.3	86.6	86.2	86.1	86.2	83.4
CT	New Haven	Hamden	93.3	86.3	85.8	85.6	85.8	82.6
CT	Middlesex	Middletown	95.7	86.2	85.5	85.9	85.5	81.0
NJ	Bergen	Teaneck	91.7	86.2	85.8	85.9	85.7	83.0
VA	Arlington	Arlington Co.	96.7	85.6	85.3	85.2	84.9	83.7
MD	Harford	Edgewood	100.3	85.2	84.5	84.4	84.2	80.8
MA	Essex	Lynn	90.0	84.9	84.5	84.8	84.5	82.5
VA	Fairfax	Fairfax Co.	96.7	84.8	84.5	84.3	84.0	83.1
NY	Jefferson	Perch River	91.3	84.7	84.2	84.5	84.2	83.6
NY	Richmond	Susan Wagner	93.0	84.6	84.2	84.2	84.1	81.2
NJ	Morris	Chester	95.3	84.4	83.6	83.8	83.6	81.0
NJ	Monmouth	Monmouth Univ.	95.7	84.3	83.6	84.0	83.5	79.5
NJ	Middlesex	Rutgers Univ.	96.0	84.1	83.4	83.8	83.3	80.3
NJ	Hunterdon	Flemington	95.3	83.9	83.1	83.8	83.0	80.1
MD	Anne Arundel	Davidsonville	98.0	83.4	82.9	82.8	82.7	80.3
MD	Anne Arundel	Ft. Meade	97.0	83.2	82.8	82.6	82.5	80.5
VA	Fairfax	Fairfax Co.	94.7	83.1	82.8	82.6	82.3	81.6
RI	Washington	EPA Lab	93.3	82.6	81.7	82.3	81.4	77.1
NY	Chautauqua	Dunkirk	93.0	82.5	82.0	82.1	81.9	80.8
PA	Allegheny	Pittsburgh (Ca	90.7	82.4	81.9	81.8	81.8	80.8
MA	Suffolk	BOSTON (Long)	88.7	82.2	81.7	81.9	81.6	79.5
NY	Putnam	Mt. Ninham	91.3	82.2	81.7	81.7	81.6	78.0
MD	Harford	Aldino	97.0	82.1	81.4	81.2	81.0	77.6

**Ozone Monitors Greater than 84.9 ppb
for OTC CMAQ OTB/OTW Simulations
(174 ozone monitors in OTR)**



4. Next Steps

OTC CMAQ Runs

- NYSDEC will redo the 2002 base case simulation using the MANEVU version 3 emission inventory and appropriate emissions inventories for other RPOs by August 2006.
- NYSDEC will do a 2009 control simulation using MANEVU version 3 emission inventory and corresponding RPO emission inventories. The control case is expected to reflect OTB/OTW controls plus viable local controls in the OTR and other RPOs by August 2006.