

Mid-course Review

MWAQC Technical Advisory Committee

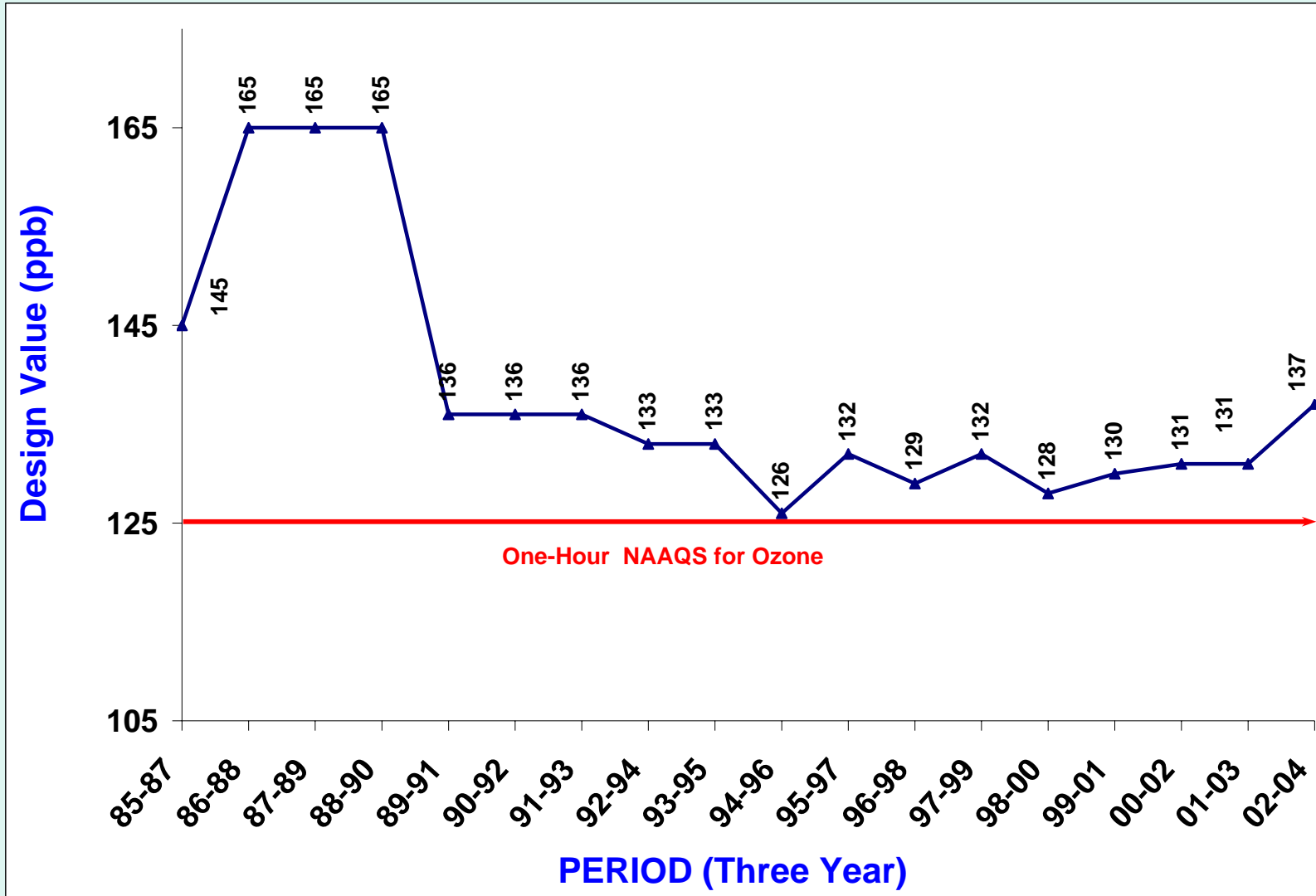
October 8, 2004

Sunil Kumar

Status of Washington area MCR

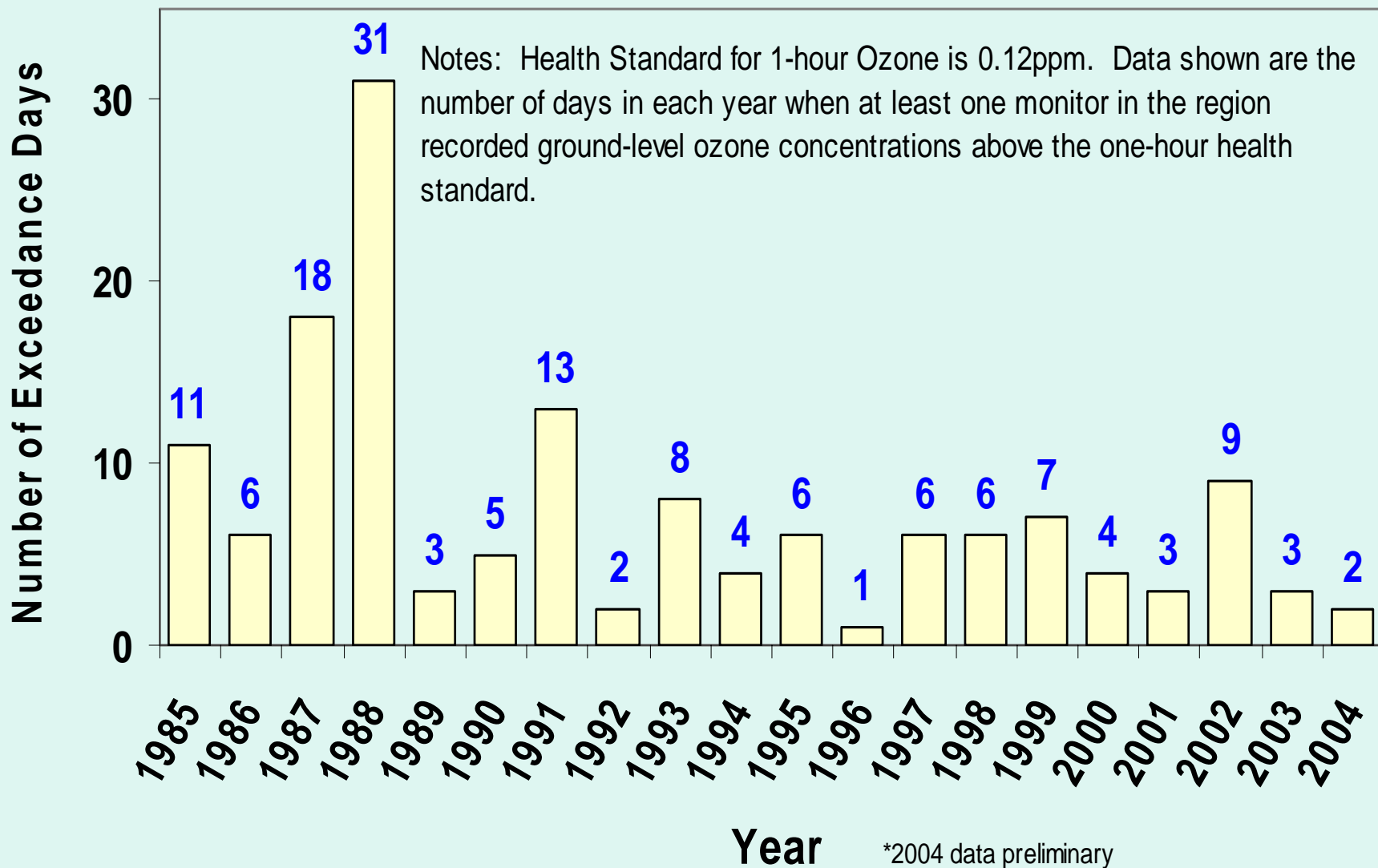
- All EPA recommended data analyses complete. Following additional analyses included to show the progress toward attainment:
 - Removal of meteorology effect on 1-hour ozone trend using an advanced statistical technique called “KZ Filter”
 - Spatial analysis of exceedances
- Benefits of NO_x SIP call discussed

Trend in 1-Hour Ozone Design Value (1987-2004)

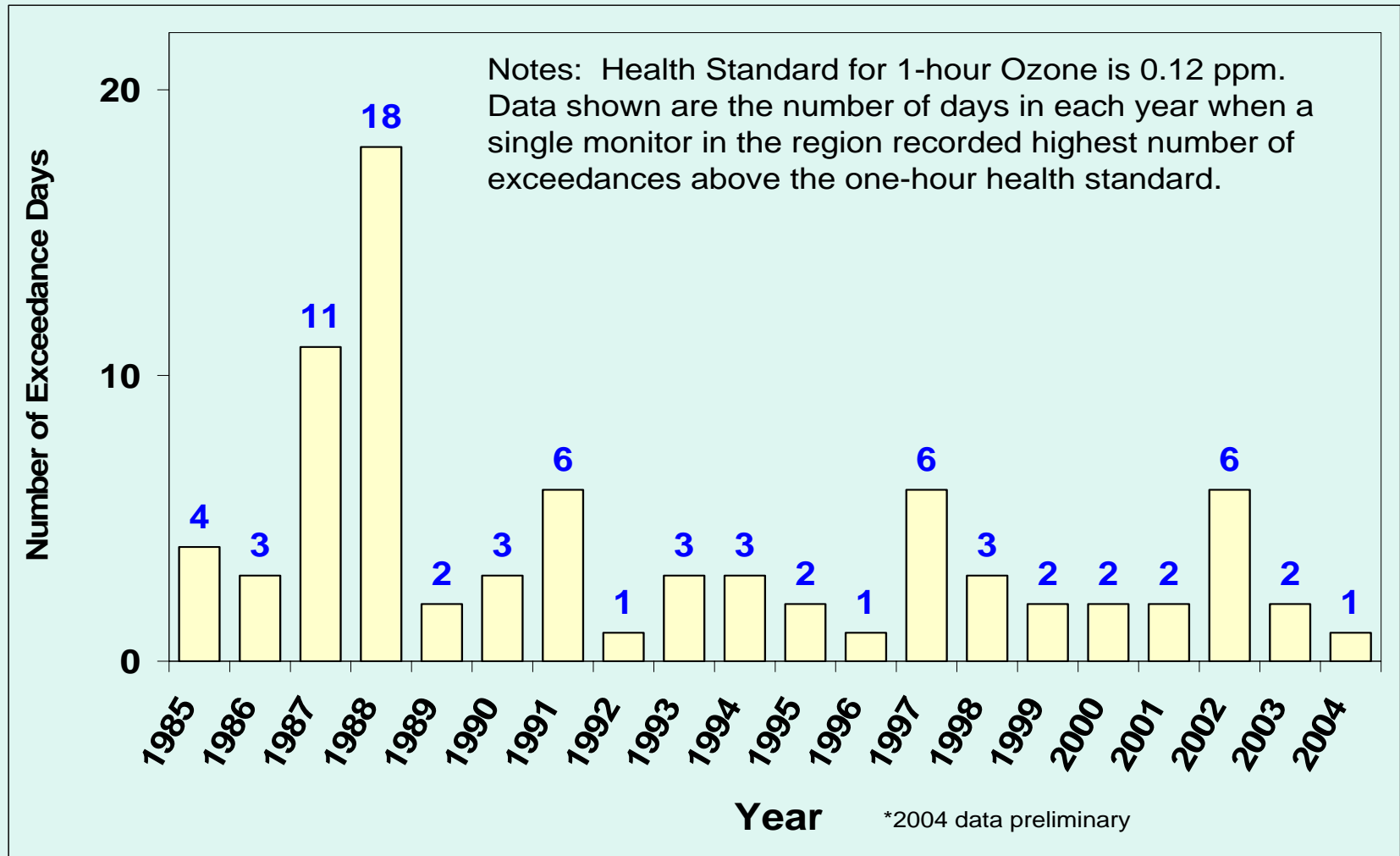


Monitored Exceedances Across All Monitors in Washington 1-Hour Nonattainment Area

(1985-2004)



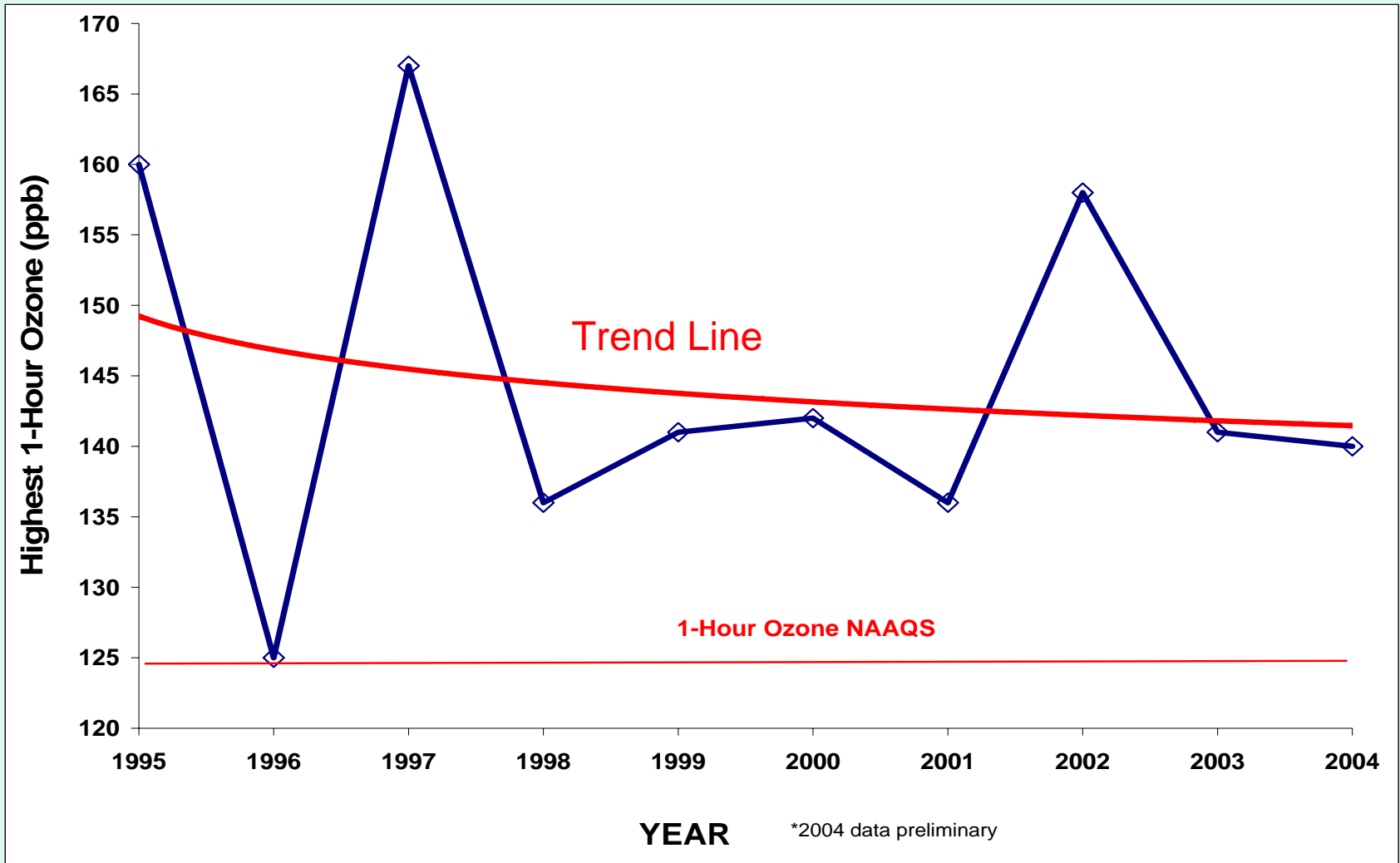
Monitored Exceedances at the Monitor with Most Exceedances in Washington 1-Hour Nonattainment Area (1985-2004)



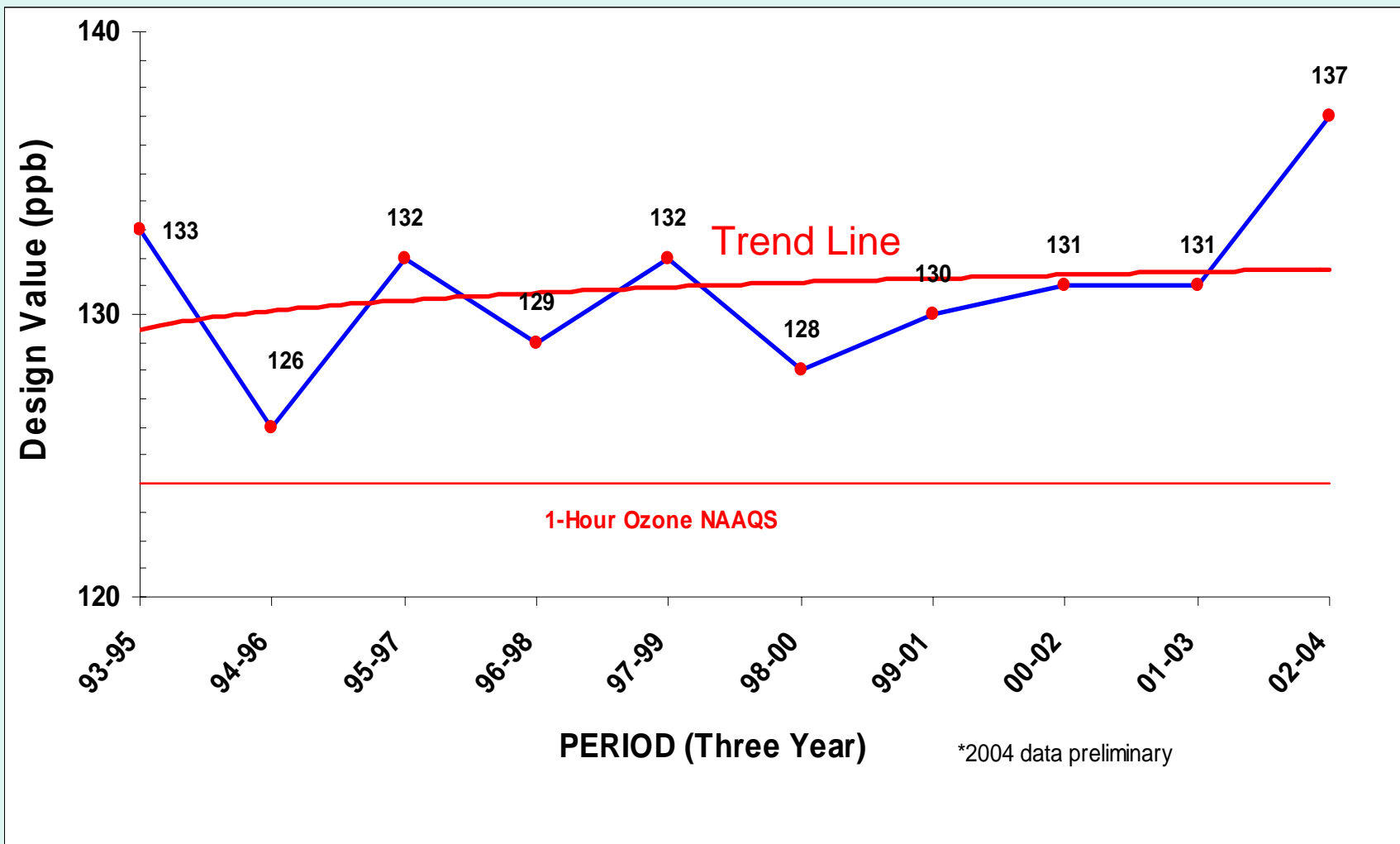
Why No Steady & Strong Downwind Trend?

- Not a very steady and strong downward trend in 1-hour ozone levels.
- Reason - Influence of meteorology and transport of ozone and its precursors.

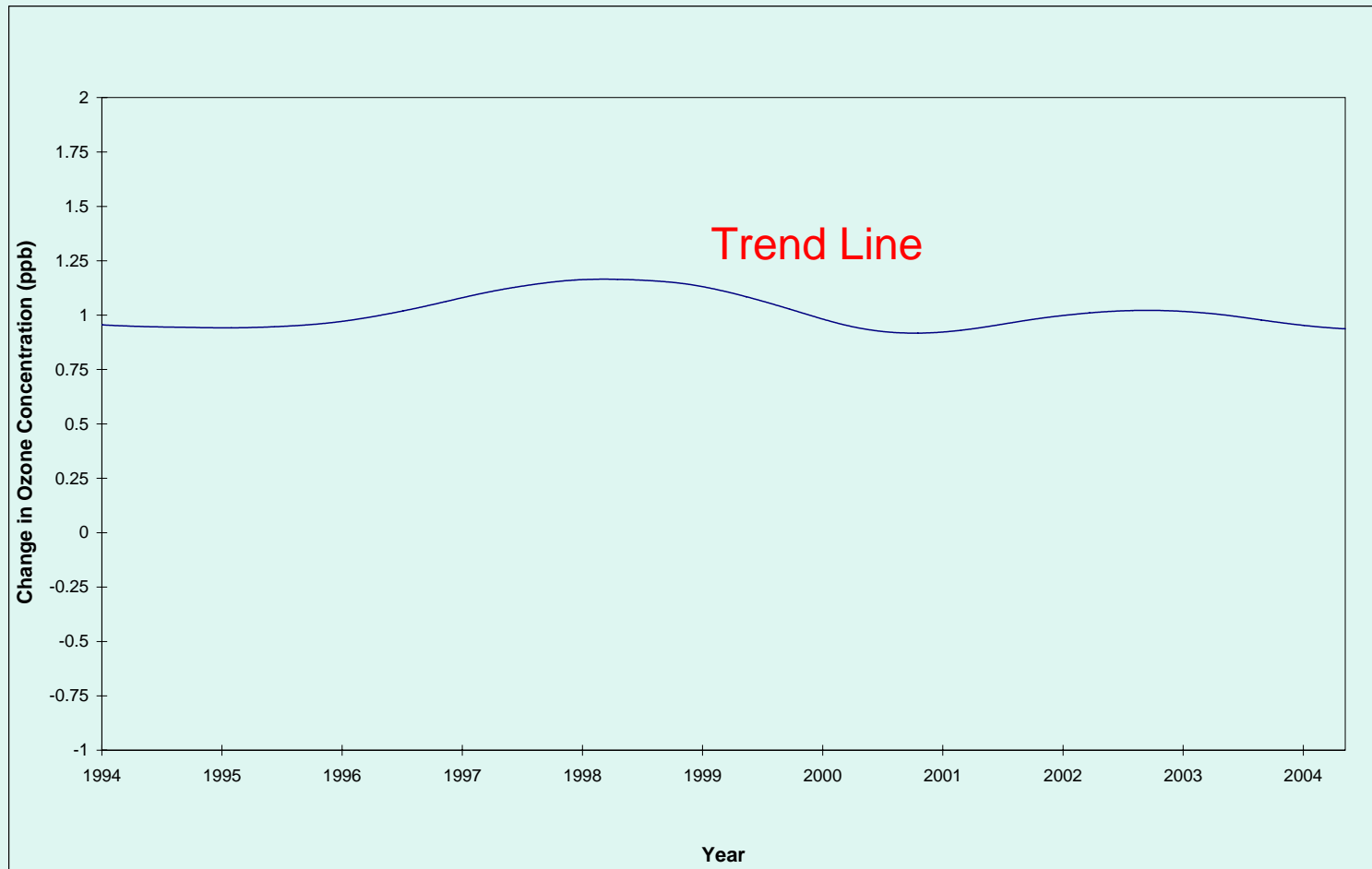
Meteorology Adjusted 1-Hour Max. Ozone in Washington Nonattainment Area



Meteorology Adjusted 1-Hour Design Value in Washington Nonattainment Area



Meteorology Adjusted Changes in 1-Hour Max. Ozone at Arlington using KZ Filter



Regional Transport Analysis using Shenandoah National Park

1-Hour Design Values

Shenandoah National Park vs. Washington 1-Hour Nonattainment Area

Monitor	2004 Design Value (ppm)	Average 1989-1990 DV (ppm)	Average 1991-2004 DV (ppm)	% Change
Shenandoah National Park	0.102	0.107	0.103	-3.7%
Washington	0.137	0.165	0.132	-20%

Peak & 4th Highest 1-Hour Ozone Concentrations Shenandoah National Park vs. Washington Area

Monitor	Peak Value (ppm)			4 th High (ppm)		
	Yearly AVG 1987-1990	Yearly AVG 1991-2004	% Change	Yearly AVG 1987-1990	Yearly AVG 1991-2004	% Change
Shenandoah National Park	0.112	0.105	-6.25%	0.095	0.093	-2.1%
Washington	0.164	0.147	-10.4%	0.130	0.118	-9.2%

August 2003 North American Electrical Blackout Study by UMD

- Provided a unique opportunity to quantify directly the contribution of power plants located in northeast US and southeastern Canada to ozone levels in Washington, DC region.
- Ozone level decreased by ~38 ppbv in response to about 34 percent & 20 percent reductions in SO₂ and NO_x emissions from power plants .
- Forecasted ozone level - 125 ppbv
- Actual ozone level - 90 ppbv

Ozone Transport via Low-Level Jets

- Low-level jets are nocturnal phenomena that have the potential for moving large pools of ozone in the lower boundary layer.
- Similar to large-scale regional transport with ozone moving above the surface then mixing down to the surface shortly after sunrise.
- Nature of low-level jets makes it difficult to quantify their contribution to ozone transport into the Washington area.
- According to an estimate these jets can routinely carry about 80 to 90 ppbv ozone.

Conclusions

- Progress towards 1-hour ozone standard is visible when 1-hour trend adjusted for meteorology.
- Progress clearly visible through spatial analysis of exceedances over the years (1987, 1993, and 2004)
- Transport has continued to significantly limit progress towards attainment of the 1-hour ozone standard.
- NO_x SIP Call will help the region attain the 1-hour ozone standard in 2005.

Next Steps

- Draft MCR to MCR Workgroup – Oct. 4
- Comments on draft, Oct. 4 - Oct. 22
- MCR Workgroup Call, Oct. 13
- Revised Draft MCR – Nov. 3
- TAC recommends approval of MCR, Nov. 12, 2004
- MWAQC approves MCR, Nov. 24, 2004
- States submit MCR to EPA – Dec. 2004