

US EPA ARCHIVE DOCUMENT

August 3, 2004

Mr. Donald S. Welsh (3RA00)  
Regional Administrator  
U. S. Environmental Protection Agency Region III Office  
1650 Arch Street  
Philadelphia, PA, 19103-2029

Dear Mr. Welsh:

We recently received a copy of the Virginia Department of Environmental Quality's (VADEQ) petition to EPA, to reclassify the Richmond ozone nonattainment area (NAA) from a "moderate" classification to a "marginal" classification. We have also received the technical support document, entitled "Richmond Ozone Nonattainment Area Petition for Reclassification Technical Support Document," dated July 12, 2004 (hereafter referred to as TSD). As a downwind state from the Richmond NAA, Delaware is providing EPA with specific comments on VADEQ's TSD relative to their air monitoring data analysis, ozone modeling analysis, and precursor emissions analysis.

As you know, over the past 30 years we have learned that our ozone nonattainment problem is pervasive, and that both the extent of the problem and the emissions that cause the problem are very large in scale. Given the pervasive nature of ozone, Delaware believes that the only solution is to subject upwind areas to the same level of control as downwind nonattainment areas (see Delaware's July 14, 2003, February 2, 2004, and February 27, 2004 letters for a detailed discussion of this issue). Delaware believes VADEQ's petition effectively removes the Richmond NAA from its responsibility as an upwind area to Delaware, and therefore requests that it not be approved by the EPA.

#### **I. Air Monitoring Data Analysis**

The EPA guidance for nonattainment "bump-downs" requires that both near- and long-term trends in emissions and ambient air quality support any downward reclassification,

and that historical air quality data should indicate substantial air quality improvement (Ref. 1). It is Delaware's position that the VADEQ's petition does not include historical data that demonstrates a substantial air quality improvement. The TSD primarily focuses on ambient concentrations which indicate a near-flat trend at three out of the four Richmond NAA monitors. The fourth monitor actually shows an increasing trend. The monitoring data therefore does not meet EPA's guidance for a bump-down. Additionally, this fourth monitor is the primary downwind monitor, which calls into question the effect of transport from the Richmond area to other downwind non-attainment areas (discussed below).

The TSD states that "three of the four monitors in the Richmond metro area have and continue to record levels consistent with a marginal nonattainment classification." It should be pointed out that ozone nonattainment classifications focus on the highest representative monitor in the designation area, and even if other monitors in the area report lower concentrations, they should not have any impact, unless a strong argument can be made and supported that the highest monitor is non-representative or biased (Ref. 2). The VADEQ failed to make such an argument, but rather stated that the highest monitor is in an area of lower population so that most people are exposed to concentrations in the marginal range rather than the moderate range. This specific argument is not consistent with EPA's standard for classification.

The TSD includes a graph of the average design value (page 4) among the four monitors in the Richmond nonattainment area, and tries to conclude that the area's design values "are consistent with a marginal nonattainment classification." As we understand the process, spatial averaging is not an acceptable procedure for ozone classifications. Further, this same graph shows an increasing trend, rather than a decreasing or stable trend. As mentioned above, this increasing trend fails to meet EPA's bump-down guidance requiring a trend of substantial air quality improvement. On the same page of the TSD is another graph showing the number of exceedance days. This graph appears to show a flat trend for the most recent years of data, which again does not demonstrate a substantial improvement in air quality.

Based on the above analysis, we believe that the first three conclusions in the Air Monitoring Data Analysis section of the TSD do not have an appropriate or acceptable technical foundation. Also, the fourth conclusion ("no exceedances of the 8-hour standard have been recorded in the Richmond area during the 2004 ozone season") is no longer valid, since on July 21, 2004 the Charles City County monitor recorded an exceedance of 91 ppb. It also should be pointed out that in addition to this one exceedance of the 8-hour standard in the Richmond areas so far this year, (1) the 2004 ozone season is not yet over, and (2) the 2004 ozone season may be an unusually wet and cool one, as the weather has demonstrated thus far, and thus may not be a good indicator of attainment status.

## II. Regional Ozone Modeling Analysis

The VADEQ fails to discuss issues regarding ozone/precursor transport and contribution from Richmond NAA to its downwind states. Long-range transport and

contribution of ozone and its precursors from an upwind area to the downwind area has been well documented and recognized. For example, the NO<sub>x</sub> SIP Call modeling results (using UAM-V and CAMx) have indicated that Virginia is an upwind area that contributes significantly to the 8-hour ozone nonattainment problem in Delaware. In particular, the UAM-V and CAMx models have estimated that Virginia's contribution to Delaware to be between 10 and 60 ppb (See Attachment 1 to this letter, and Reference 3).

Similar modeling work was performed by EPA for its Interstate Air Quality Rule (IAQR). In this more recent work, the CAMx source apportionment modeling results have demonstrated that Virginia contributes to Delaware's New Castle County from 8 ppb to a maximum of 17 ppb in 2010 (Reference 4). Delaware believes that (1) this contribution is definitely significant, and (2) if this contribution, and like contributions from other upwind states are not removed, it will be very difficult, if not impossible, for Delaware to reach attainment by 2010.

Also, recent CALGRID modeling performed by Delaware using 2010 OTC NO<sub>x</sub> Resolution emissions, which accounts for 22% NO<sub>x</sub> reduction from CSA2003 elevated point sources, shows as much as 24 ppb contribution from Virginia to Delaware's 1-hour ozone concentrations. A discussion of these modeling results is attached to this letter (See Attachment 3 to this letter).

Note that all of the above mentioned modeling excursions, which include the reductions from the federal measures VADEQ mentions in their TSD, indicate that a significant contribution from Virginia to Delaware remains in 2010 (i.e. Delaware's attainment date). This means reductions in Virginia beyond these federal measures are needed to mitigate the contribution from Virginia to Delaware. Delaware believes the Richmond NAA moderate classification is consistent with their obligation to mitigate this negative contribution. For example, Rate-of-progress (ROP) emission reduction requirements are mandated in moderate NAA's by the CAAA, are subject to EPA and public review, and will help Virginia mitigate its negative impact on Delaware. No ROP reductions are required under the CAAA for marginal areas, so if the bump-down were approved the Richmond NAA would not be required to reduce emission beyond the federal measures mentioned in the TSD (i.e., beyond the measures that modeling clearly shows are insufficient). Given the proven negative impact of up-wind emissions on downwind nonattainment, it is not appropriate to exempt areas with significant emissions from these ROP requirements.

### **III. Precursor Emission Analysis**

In this section of the TSD, VADEQ presents its estimates of precursor emission reductions between 2002 and 2007, and claims that "significant reductions in both VOC and NO<sub>x</sub> emissions are expected in the Richmond area." Attachment 2 to this letter presents a simple comparison of emissions between Richmond NAA and Delaware NAA. This comparison demonstrates that both the total emissions and the spatial emission intensity (SEI, in term of TPD per square mile) of the Richmond NAA are much higher than that of Delaware. We believe that total emissions and the SEI are useful tools to help evaluate

nonattainment area classifications relative to large-scale, regionally driven air quality problems, like ozone pollution.

EPA's bump-down guidance requires that growth projection and emission trends support a bump-down request (Ref. 1). The VADEQ does not appear to present any discussion on growth projection for Richmond NAA. VADEQ only lists three major categories of existing and future federal controls on which the Richmond NAA depends for significant emission reductions in 2007, some of which appear to produce reductions only after 2007. These controls are not sufficient to mitigate Virginia's negative impact on Delaware (see modeling discussion above).

Based on total emissions and the SEI, it is unreasonable and unacceptable to classify Richmond area as a "marginal NAA" that would be subject to less stringent requirements in its emission reductions, while maintaining Delaware, which has smaller total emissions and SEIs, as a "moderate NAA" requiring more emission reductions. This does not indicate that Delaware supports a bump-down for its own non-attainment counties, rather it supports that all areas with significant emissions that impact downwind nonattainment areas be subject to consistent and specific ROP emission reduction requirements. Such areas include, relative to Delaware, those in Michigan, Ohio, Pennsylvania, West Virginia, Virginia, North Carolina, New Jersey, Delaware, Maryland, and New York.

#### **IV. Concluding Remarks**

Based on our review and analysis of VADEQ's TSD and relevant data, Delaware's conclusions and position relative to VADEQ's petition are as follows:

1. The VADEQ does not provide adequate air quality analysis and arguments to support its petition.
2. The VADEQ fails to adequately address issues regarding ozone/precursor transport. Delaware is extremely concerned about how VADEQ will deal with Virginia's significant contributions to nonattainment problems in its downwind states, including Delaware.
3. Delaware is against approval of such a petition, unless the transport and contribution issues are addressed to our satisfaction.
4. It would be unreasonable and unfair to Delaware (and to other downwind states as well) if VADEQ's petition is approved to bump-down the Richmond NAA, since the Richmond NAA has significant emissions that, based on modeling and lacking any additional local controls, will continue to negatively impact Delaware after both the 2007 marginal and 2010 moderate attainment dates.

I also understand that requests for 8-hour ozone classification "bump-downs" have been requested by Maryland and Pennsylvania. I have requested copies of these requests from EPA, but have not yet received them. I request that EPA not take any final action on these other requests until Delaware has been afforded ample time to review them, and until EPA has considered any comments Delaware may have in making their final determination.

Thank you for considering our comments. If you have any question, or would like to discuss this matter further, please contact me at (302) 739-4791.

Sincerely,

Ali Mirzakhali  
Administrator

cc: John A. Hughes  
John B. Blevins  
Judith Katz  
David Arnold

## References

1. “Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards; Early Action Compact Areas With Deferred Effective Dates”, USEPA, 40 CFR Part 81, Federal Register: April 30, 2004 (Volume 69, Number 84), Rules and Regulations, Page 23857-23951.
2. “Final Rule To Implement the 8-Hour Ozone National Ambient Air Quality Standard--Phase 1”, USEPA 40 CFR Parts 50, 51 and 81, Federal Register: April 30, 2004 (Volume 69, Number 84), Rules and Regulations, Page 23951-24000.
3. Appendix D: 8-Hour Upwind/Downwind Linkages, Air Quality Modeling Technical Support Document for the NO<sub>x</sub> SIP Call, US EPA, Office of Air and Radiation, September 23, 1998.
4. Appendix G: Metrics for 8-Hour Ozone Contributions to Downwind Nonattainment Counties in 2010, Technical Support Document for the Interstate Air Quality Rule Air Quality Modeling Analyses, USEPA, January 2004.

<b>Attachment 1</b>				
<b>Contributions from Upwind States to Delaware's 8-Hour Ozone Nonattainment.</b>				
Contributing State	UAM-V/Zero-Out		CAMx Modeling	
	Min, ppb	Max, ppb	Min, ppb	Max, ppb
Illinois	2	3	2	7
Indiana	2	3	2	6
Kentucky	2	4	5	9
Michigan	2	7	2	9
North Carolina	5	22	5	28
Ohio	2	6	5	14
Pennsylvania	---	---	10	32
Tennessee	2	3	2	7
<b>Virginia</b>	<b>10</b>	<b>34</b>	<b>10</b>	<b>60</b>
West Virginia	5	15	5	17

Note: Data in this table are compiled from NOx SIP Call modeling results (Ref. 3)

<b>Attachment 2</b>				
<b>Comparison of 2002 Ozone Season Daily Emissions</b>				
	Richmond	Delaware	Richmond	Delaware
	NAA	NAA	NAA	NAA
	VOC	VOC	NOx	NOx
Total emission in 2002, TPD	139.5	117.1	238.5	207.0
Land area, sq. miles	1686	1983	1686	1983
<b>Emission TPD per sq. mile</b>	<b>0.08</b>	<b>0.06</b>	<b>0.14</b>	<b>0.10</b>

Notes: Richmond emission data from VADEQ's Petition Technical Supporting Document.  
 Delaware emission data from its June 1, 2004 submission to EPA's NEI Database.  
 Land area data from US Census Bureau website  
<http://www.census.gov/geo/www/ezstate/poverty.html>

**Attachment 3**  
**Delaware's Modeling Results for Transport and Contribution from Virginia to Delaware**

Delaware's own modeling analyses has indicated that transport from Virginia into Delaware is significant, and cannot be ignored. Figures 1, 2, and 3 depict 48-hour back trajectories that correspond to the days with the highest ozone values in Delaware. Figure 1 clearly indicates that the trajectory came from the Richmond ozone non-attainment area on 11th June 2001, a day for which Sussex County was in non-attainment for ozone. Therefore, based on this evidence we can conclude Richmond ozone non-attainment area contributes to Delaware's ozone non-attainment on 11<sup>th</sup> June 2001. Figures 2 and 3 also indicate that Virginia causes transport of ozone and its precursors thereby aggravating Delaware's non-attainment of ozone NAAQS.

We performed CALGRID modeling for June 1995 episode with emissions for 2010 OTC NOx Resolution, which accounts for 22% NOx reduction from CSA2003 elevated point sources. The June 1995 episode is a 12-day episode with June 12<sup>th</sup> as the first day. Virginia's



impact is assessed by zeroing out emissions in the modeling domain from all states but for Virginia's. Edge effects due to boundary conditions are modeled by zeroing out emissions in the entire modeling domain. Virginia's impacts are assessed by subtracting the latter concentrations from the former. Hourly variations of such impacts are captured for the entire modeling episode. Figures 4 and 5 clearly show that Virginia impacts Delaware on both days - June 21<sup>st</sup> and 22<sup>nd</sup>. These figures also demonstrate that Virginia's contribution to Delaware's hourly ozone contribution could be as much as 24 ppb on both days. Such a contribution is significant, which might prevent Delaware from attaining the 8-Hr ozone NAAQS in spite of its local control measures. In other words, Delaware's local control measures alone will not be enough to bring the area into attainment without addressing the transport from Delaware's upwind states including Virginia.

The evidence presented above clearly points to the fact that Virginia is an upwind state to Delaware and contributes significantly to Delaware's ozone non-attainment. Therefore, EPA should account for Virginia's ozone transport into Delaware as one of the major factors for not bumping down Richmond metro area to a marginal ozone non-attainment area.

NOAA HYSPLIT MODEL  
Backward trajectories ending at 16 UTC 11 Jun 02  
EDAS Meteorological Data

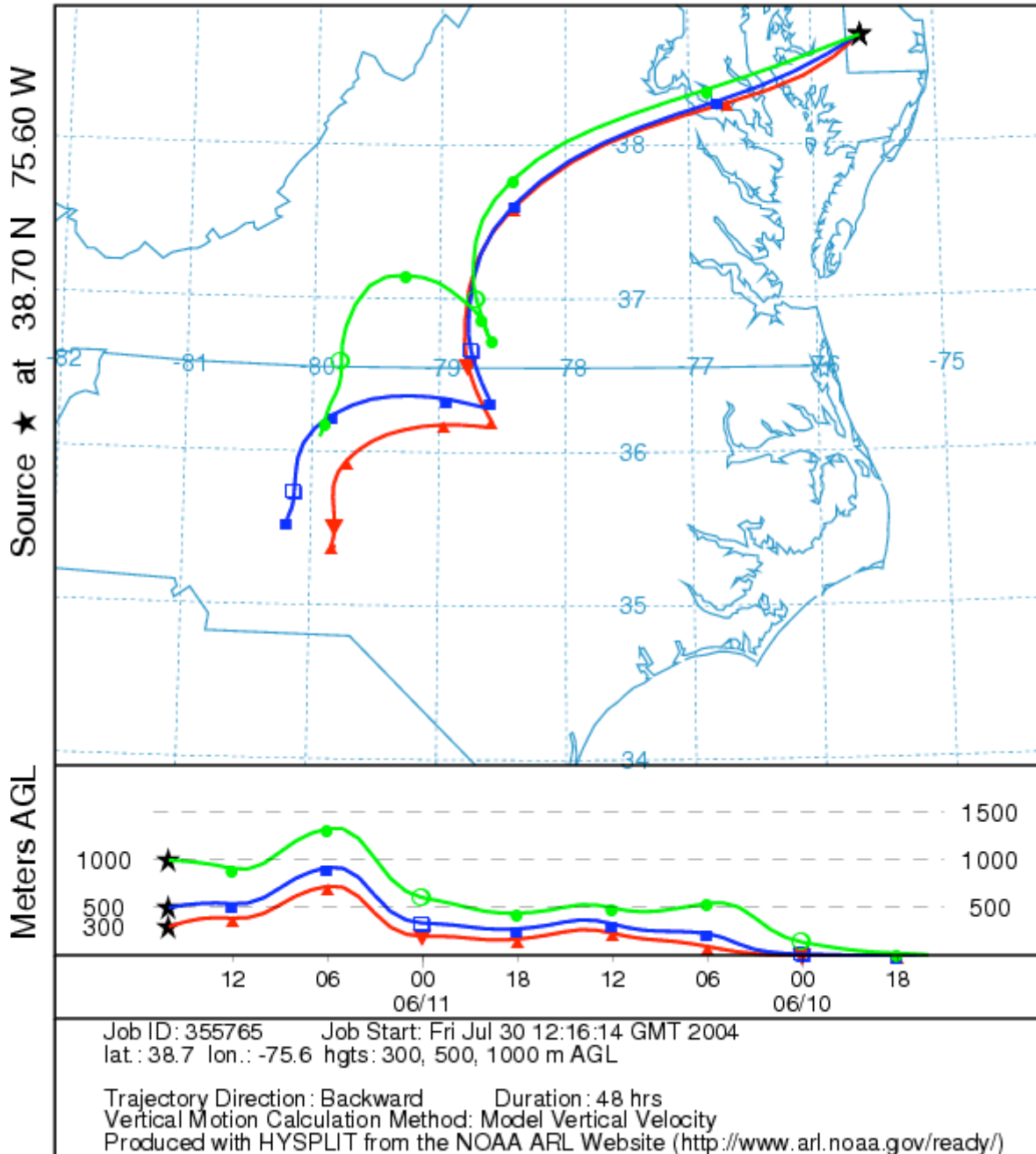


Figure 1: The 48-Hour Back Trajectories for June 11, 2002.

NOAA HYSPLIT MODEL  
 Backward trajectories ending at 16 UTC 27 Jun 01  
 EDAS Meteorological Data

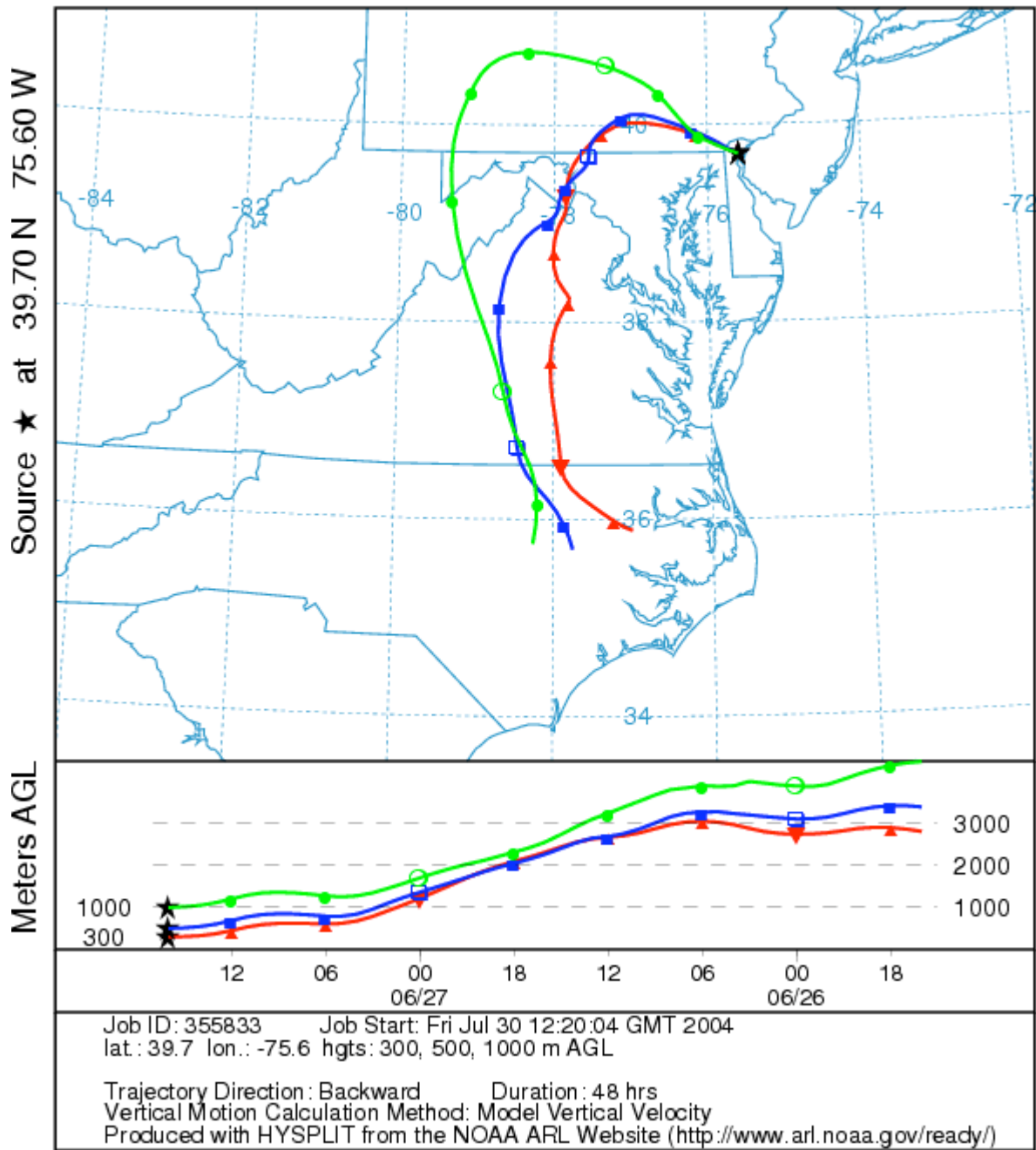


Figure 2: The 48-Hour Back Trajectories for June 27, 2001.

NOAA HYSPLIT MODEL  
 Backward trajectories ending at 16 UTC 17 Jul 01  
 EDAS Meteorological Data

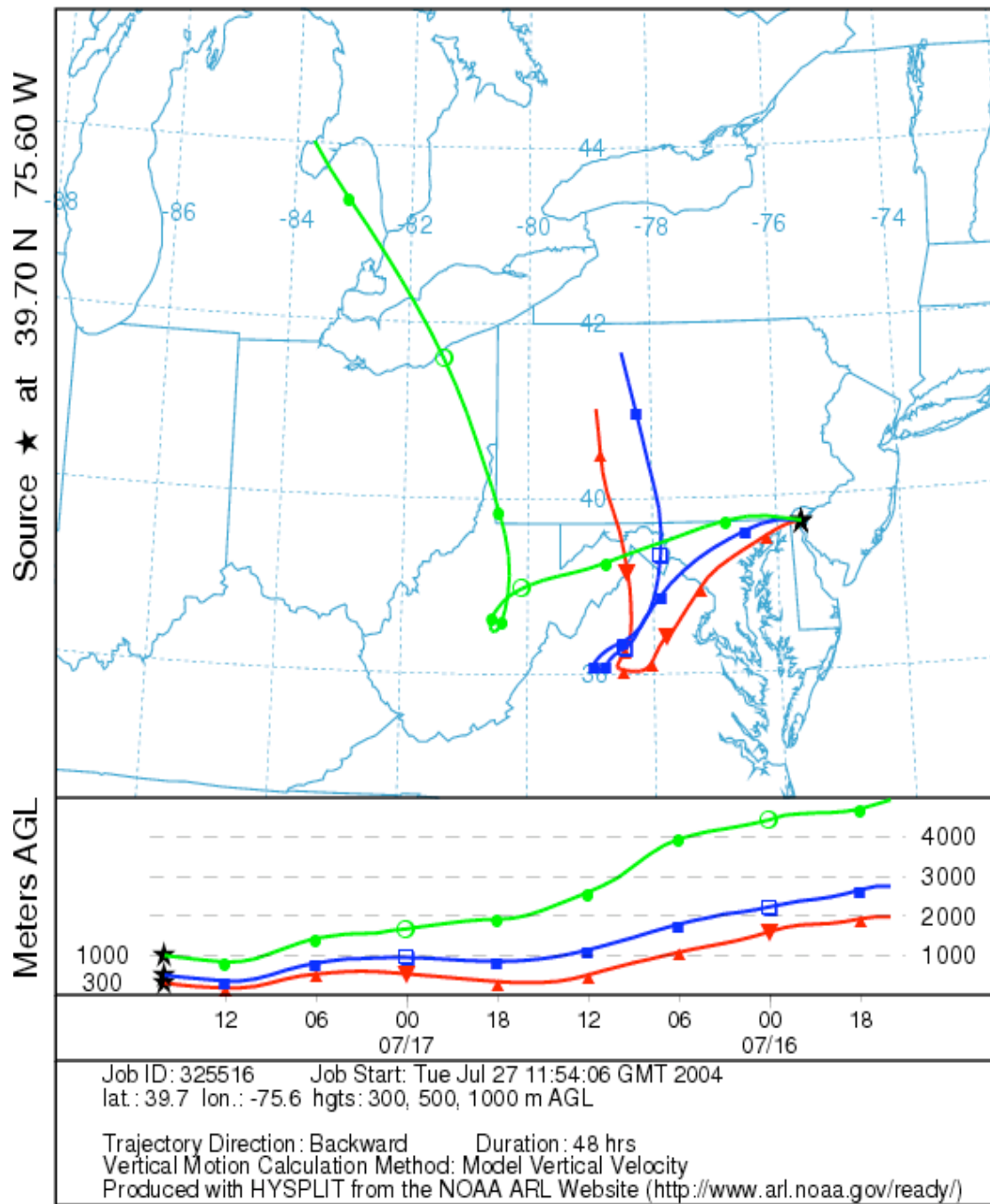


Figure 3: The 48-Hr Back Trajectories for July 17, 2001.

Ozone(ppb) at 50m on CALGRID 2.0 Domain  
2010 OTC NOx Resolution:Base Case Virginia's Impact only  
Hour 16 on June 20, 1995

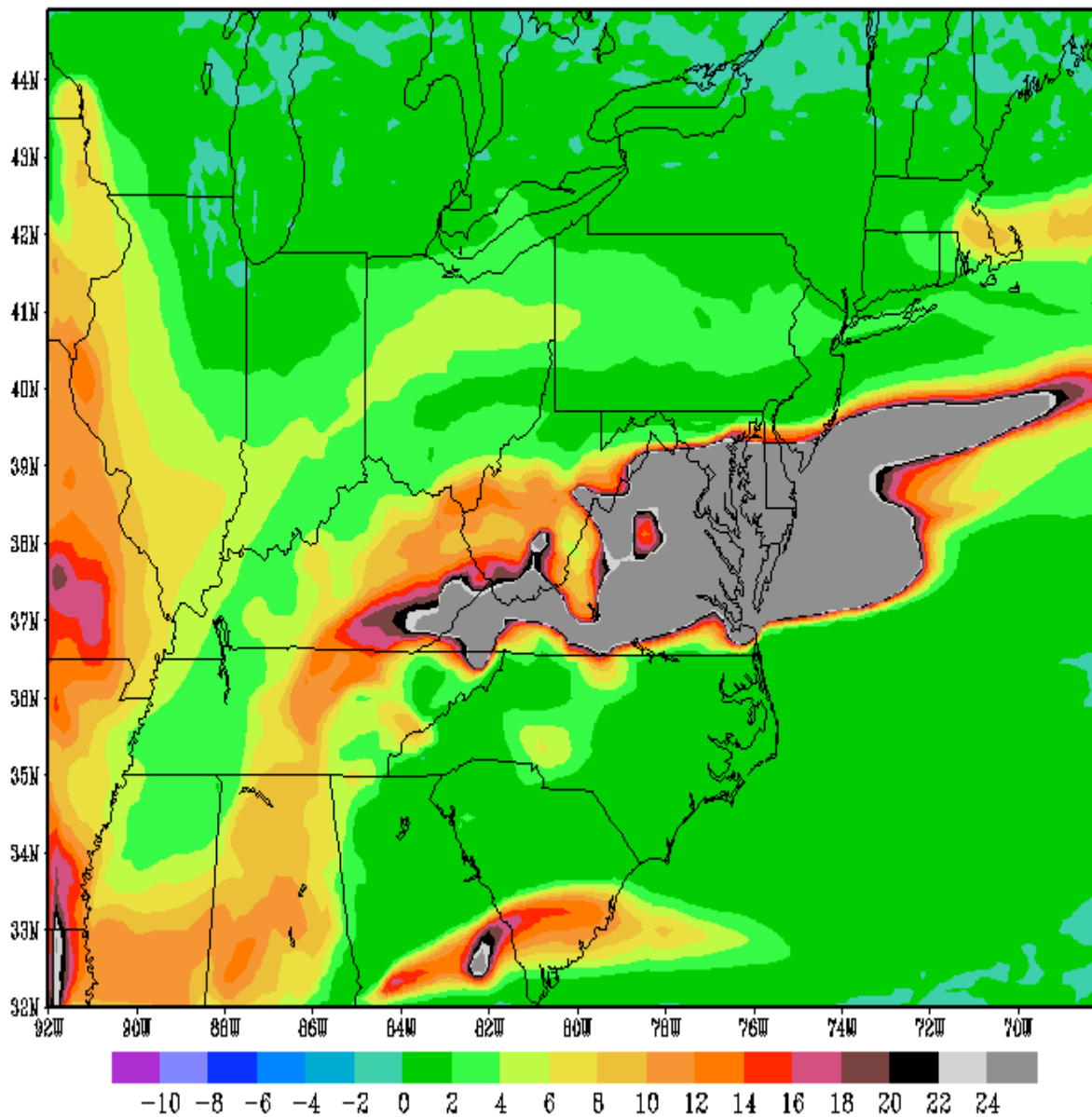


Figure 4: Virginia's contribution to its neighboring states for June 20, 1995 episode day for 2010 OTC NOx Resolution.

Ozone(ppb) at 50m on CALGRID 2.0 Domain  
2010 OTC NOx Resolution:Base Case Virginia's Impact only  
Hour 16 on June 21, 1995

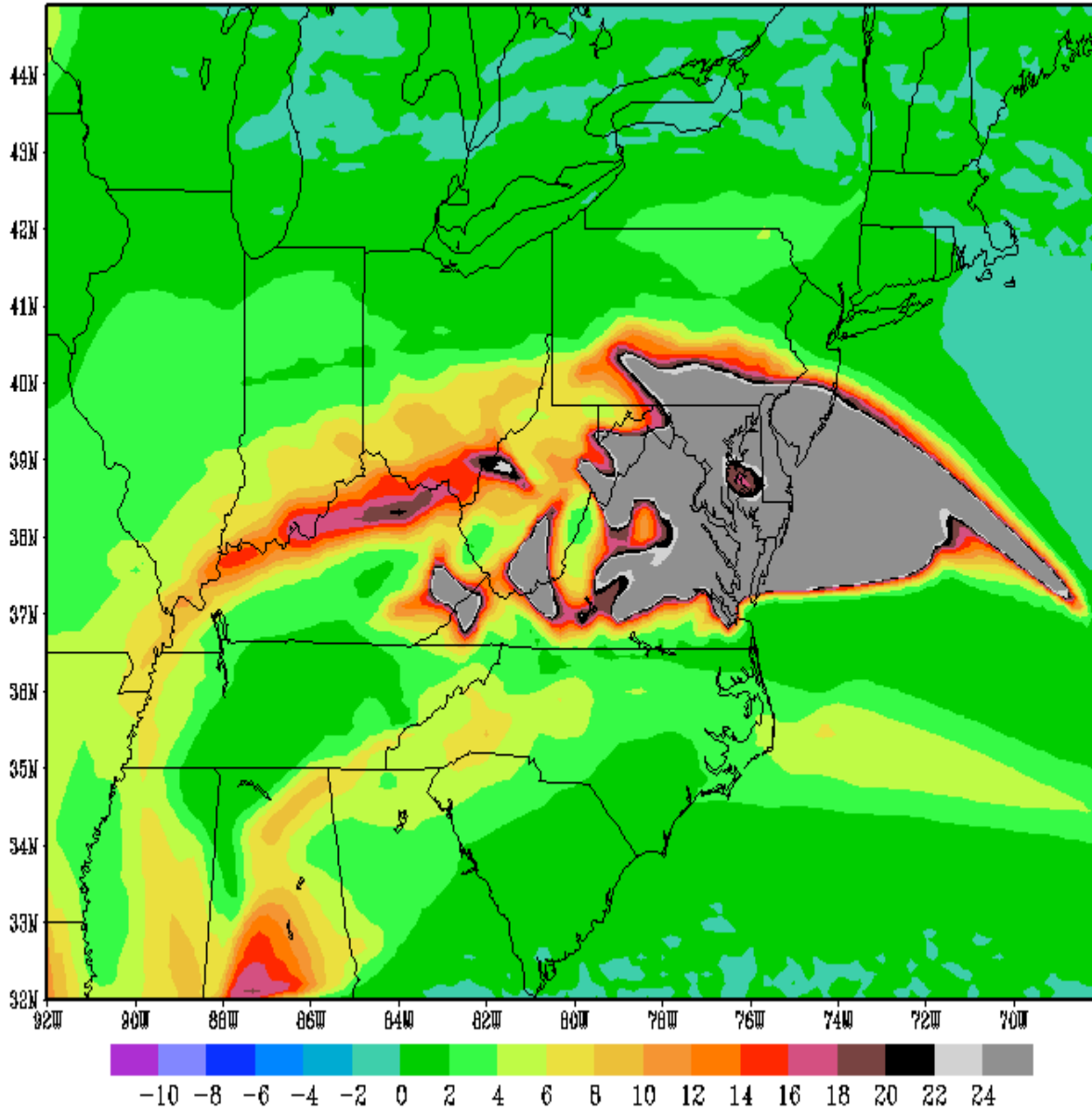


Figure 5: Virginia's contribution to its neighboring states for June 21, 1995 episode day for 2010 OTC NOx Resolution.