State of New Hampshire

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CRAIG R. BENSON
Governor

July 15, 2003

Mr. Robert W. Varney
Regional Administrator
U.S. Environmental Protection Agency, Region I
One Congress Street, Suite 1100
Boston, MA 02114-2023

Re: Designation of Nonattainment Areas Under the 8-Hour Ozone Standard

Dear Mr. Varney:

As required by the Clean Air Act ("CAA" or "Act") and the Transportation Equity Act for the 21st Century ("TEA-21"), I hearby submit boundaries for areas of New Hampshire which either do not currently attain the 8-hour National Ambient Air Quality Standard ("NAAQS") for ground level ozone or may exacerbate 8-hour ozone violations in downwind areas.

In 1998, the U.S. Environmental Protection Agency ("EPA") proposed that Consolidated Metropolitan Statistical Areas ("CMSAs") based on the 1990 census be used presumptively to establish 8-hour ozone nonattainment area boundaries. However, CMSAs are defined by socio-economic patterns proximate to urban centers rather than by factors which determine air quality. In addition, the CMSA approach is contrary to the science that underlies EPA's own progressive NOx SIP Call, which found that large regions of the eastern United States contribute significantly to downwind ozone nonattainment for distances well beyond CMSA boundaries. Historically, the CMSA approach has had limited success in achieving attainment of the 1-hour ozone NAAQS in the eastern United States because regional pollutants like ozone easily traverse CMSA boundaries, but legal responsibility for reducing emissions typically does not. In fact, the majority of the ozone violations occurring within the Boston CMSA (which includes the portions located in New Hampshire) originate from other CMSAs and non-CMSAs further upwind. As a result of these shortcomings, the State of New Hampshire believes that using CMSAs is a poor way to define 8-hour ozone nonattainment areas. Therefore New Hampshire has applied the flexibility allowed in the guidance to develop more scientifically sound nonattainment area boundaries for the state. It is important to note that these boundaries were developed in consultation with EPA Region I. On August 18, 1999, New Hampshire submitted to EPA preliminary areas of violation ("AOV") for the state as proposed by the Federal Advisory Committee Act ("FACA"). Following consultation with EPA Region 1, New Hampshire proposed a significantly expanded area of nonattainment, to

what the State believes is the maximum extent supported by the science. The resulting designation is consistent with EPA's guidance for pursuing alternatives to its presumptive CMSA approach, as well as with CAA Section 107(d)(1)(A). These provisions require states to consider population, population density, projected growth, existing air quality, and prevailing meteorology. In making its area designation, New Hampshire also considered a more important ozone determinant – geographic emission density – to ensure the inclusion of areas with significant emissions. Beyond this, New Hampshire voluntarily examined airflow trajectories during periods of high ozone in neighboring states to ensure New Hampshire's culpability, if any, is considered in the state's proposed boundaries.

In New Hampshire's previous letter of designation, dated July 24, 2000, the State proposed similar boundaries to those I propose today. Those boundaries withstood the scrutiny of neighboring states and EPA Region 1 as being generally reasonable, however in recent discussions with EPA Region 1, EPA expressed its concern with having the proposed 8-hour nonattainment area boundaries not being fully inclusive of the Boston CMSA boundaries or the existing 1-hour serious nonattainment area boundaries within the state. Because of the low-levels of emissions in the towns that fall within those boundaries but do not fall within our proposed nonattainment area boundaries, we expect negligible additional benefit towards improved air quality in the region if these towns were to be included within the nonattainment area. Also, because of the uncertainty that these areas face in future emission reduction controls required and associated economic penalties, I find the risk of further expanding our proposed nonattainment boundaries beyond what is scientifically justified, to be too great. A map of the proposed New Hampshire nonattainment area boundaries for the 8-hour ozone NAAQS is shown in Figure 1. Greater detail regarding New Hampshire's boundary determinations is provided in the accompanying Technical Attachment.

It is also important to note that I submit this 8-hour ozone nonattainment area designation within New Hampshire as part of a bigger picture of air pollution throughout New England. New Hampshire is willing to consider linkage of the New Hampshire proposed area and classifications with those proposed by Maine and Massachusetts provided that they agree to being linked and that the conditions associated with their proposed areas does not cause any undue harm to New Hampshire. Along those lines, New Hampshire would find it unacceptable under any conditions to be linked to Barnstable, Bristol, and Plymouth counties in southeastern Massachusetts because the violations that occur in those 3 counties are caused by pollution transported from the New York City urban area. Because of this, New Hampshire expects those counties to have more difficulty meeting clean air goals than the remainder of eastern Massachusetts. It is unacceptable for New Hampshire nonattainment areas to be subjected to emission control requirements for the benefit of an area that will never see the benefit of mandated New Hampshire-based emission reductions. Whether or not the New Hampshire 8-hour ozone nonattainment area is linked to similar areas within our neighboring states, New Hampshire agrees to coordinate efforts to ensure reasonable and consistent nonattainment classifications across the region.

Finally, this submittal also presupposes EPA's recognition of the actual dynamics of ozone formation in the coastal areas of the Gulf of Maine. In particular, while a joint New Hampshire-Maine nonattainment area makes sense in terms of covering the New Hampshire-

Maine portion of the area of influence ("AOI") associated with coastal ozone violations in northern New England, this area is not sufficiently culpable to render it capable of eliminating these violations. Photochemical modeling demonstrates that New Hampshire – which has the greater ozone-forming nitrogen oxide ("NOx") emissions of the two states – is not even primarily responsible for high ozone levels within its borders or in the State of Maine. In fact, modeling shows that New Hampshire emissions are responsible for just 1% to 3% of the ozone concentrations occurring within New Hampshire and Maine during periods of violation. The remaining 97% to 99% comes from sources upwind of New Hampshire. Thus, in order to achieve attainment in areas that are subject to overwhelming ozone transport, EPA must maintain its regulatory focus on NOx emissions and ozone originating in large, upwind urban areas with high geographic emission densities. In the case of the New Hampshire ozone nonattainment areas, the primary sources of ozone are the Boston and New York City urban areas, therefore the same principle applies to several other downwind ozone nonattainment areas throughout the eastern United States.

Thank you for your consideration of my recommendations. As stated before, while my recommendations do vary from the presumptive norm of CMSA boundaries, they follow EPA's published guidance in establishing alternatives. I expect that EPA would provide my staff with similar scientific analyses and anticipated air quality benefits should you choose to make any alterations to my proposal.

If you have any questions regarding this determination, please contact Michael Nolin, Commissioner of the Department of Environmental Services at (603) 271-3449.

Sincerely,

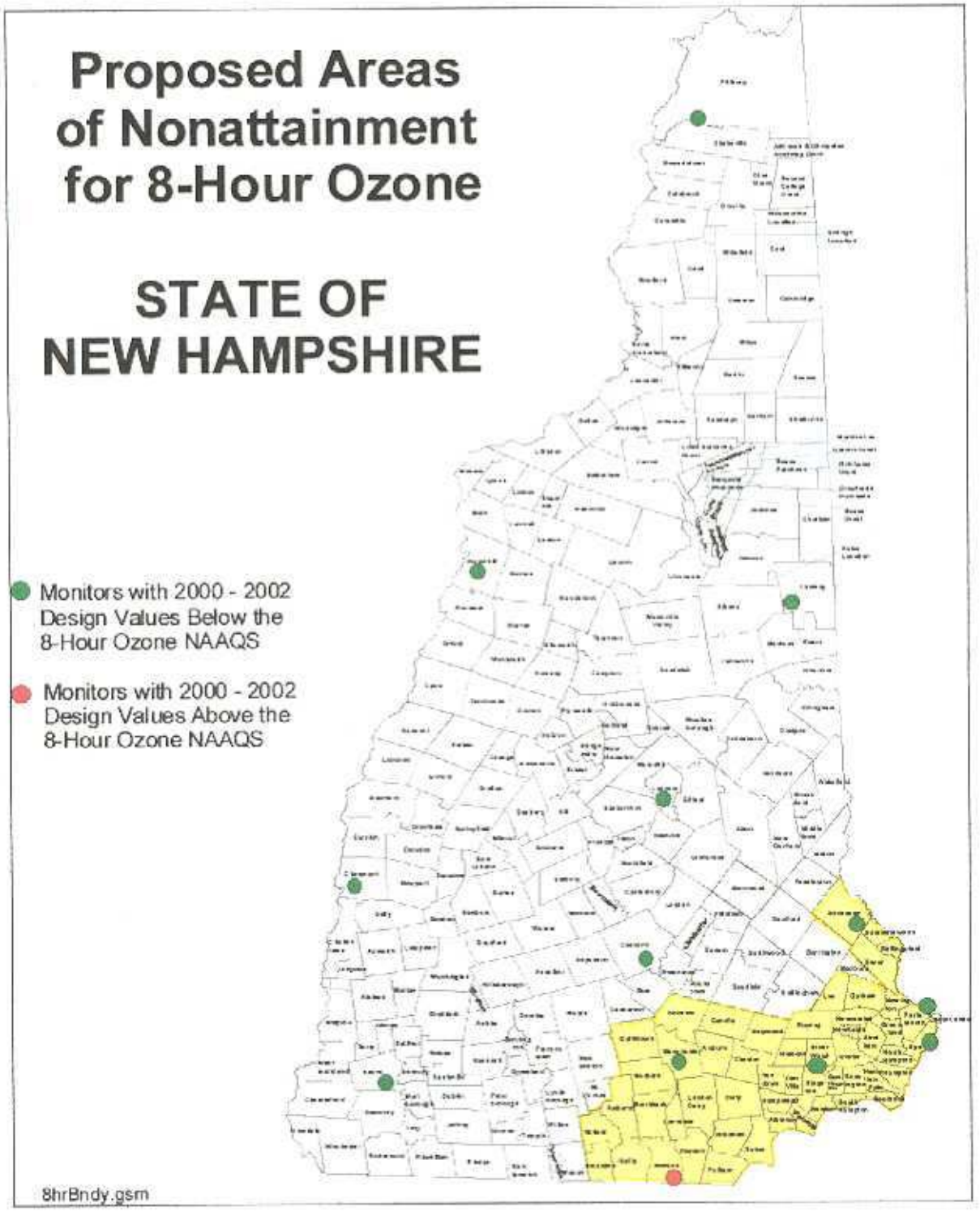
Craig R. Benson
Governor

Attachments

cc: Michael Nolin, DES
Robert Scott, DES
Ken Colburn, NESCAUM
Chris Recchia, OTC

P.S. Bob you know Mike Nolan & I are right on this. Please help us make this work.

FIGURE 1. Proposed Areas of Nonattainment for 8-Hour Ozone NAAQS in New Hampshire



TECHNICAL ATTACHMENT

Rationale for New Hampshire's 8-Hour Ozone Nonattainment Area Boundaries

Rationale for New Hampshire's 8-Hour Ozone Nonattainment Area Boundaries

The recommendations contained in this letter are fully compliant with Section 107(d)(1)(A) of the Clean Air Act ("CAA") which defines a nonattainment area as any area that (1) does not meet the ozone National Ambient Air Quality Standard ("NAAQS"), or (2) contributes to ambient ozone violations in a nearby area.

As suggested by the CAA, the U.S. Environmental Protection Agency's ("EPA") "presumptive norm" for determining 8-hour ozone nonattainment area boundaries is based on the 1990 census-based Consolidated Metropolitan Statistical Areas ("CMSAs"). After carefully examining air pollution transport, EPA's Federal Advisory Committee on ozone, fine particulate matter, and regional haze ("FACA") concluded that areas violating ozone standards should be associated with the upwind areas which influence these violations. Regrettably, this scientific cornerstone is ignored under the CMSA approach. The CMSA approach (grounded as it is in census data rather than scientific data) does not adequately capture meteorology, geographic emission densities, and other technical considerations that determine air quality. As a result, it should not be used for defining nonattainment areas. The CMSA approach is also contrary to EPA's own progressive NOx SIP Call, which concludes that large areas of the Eastern U.S. significantly contribute to ozone nonattainment across great distances, i.e., well beyond CMSA boundaries. The CMSA approach was also used as the presumptive norm for the 1-hour ozone nonattainment area boundaries and, to-date has had minimal success achieving attainment. Since the passage of the CAA Amendments of 1990, the science of photochemical modeling and airshed analysis has progressed significantly; EPA should fully employ this progress in making 8-hour ozone nonattainment designations.

Areas of 8-Hour Ozone Violation

New Hampshire's analyses for the identification of areas within the State that are in violation of the 8-hour ozone standard were summarized in the State's August 18, 1999 letter of preliminary designations to EPA. After examining the attainment status with updated monitoring data up to and including the 2002 ozone season, only the Nashua monitor currently violates the standard (Table 1). New Hampshire recognizes that the current areas of violation are unusually small compared to the typical area over the past 10 years due to the low ozone season of 2000. Therefore the area New Hampshire is actually proposing as nonattainment accounts for such year-to-year variations in weather patterns so that the boundaries should not fluctuate on an annual basis. In addition, the currently proposed boundaries made some conservative assumptions, such as considering a 2-year average for each monitor (1-year for Portsmouth) to exclude the influence of the unusually low ozone year of 2000. Through this methodology, 4 monitors (Brentwood, Nashua, Portsmouth, and Rye) are expected to violate the 8-hour ozone NAAQS.

TABLE 1. 2000 – 2002 8-Hour Ozone Design Values by Monitor, in parts-per-billion (ppb)

Location	Monitor ID	2000 4th Max	2001 4th Max	2002 4th Max	2000-02 Design Value
Nashua	330111010	70	**91**	**94**	**85**
Portsmouth	330150009	67	59*	**90**	72*
Rye	330150012	68	**93**	**89**	83
Brentwood	330150013	61	**88**	**91**	80
Claremont	330190003	67	72	82	74
Concord	330130007	65	72	**85**	74
Conway	330031002	58	74	70	67
Haverhill	330090008	62	72	71	68
Keene	330050007	63	74	84	74
Laconia	330012003	N/A	80	80	80#
Manchester	330110016	63	74	**85**	74
Rochester	330173002	65	78	**90**	78

** - 2001 monitoring data capture for Portsmouth was for a partial year and thus below EPA accepted levels. The design value was therefore calculated according to EPA guidelines.*

 # - 2-year average.

Areas of Influence vs. CMSA

In accordance with EPA's March 28, 2000 boundary designation guidance, New Hampshire is proposing boundaries for areas within the state that have any potential to influence downwind violations of the 8-hour ozone NAAQS. To start with, all New Hampshire towns within the 1990 census-based Boston/Worcester/Lawrence CMSA, and the Town of Bow, were considered for inclusion within the State's defined boundaries. Consistent with EPA's guidance and the CAA Section 107(d)(1), New Hampshire examined population, population density, projected growth, air quality, and prevailing meteorology. Perhaps even more importantly, New Hampshire also investigated geographic emission densities to ensure inclusion of areas with significant emissions. Towns were excluded from the CMSA presumptive norm only if there was an absence of scientific merit for including them within the State's nonattainment boundaries. The towns that were removed are located along the rural periphery of the CMSA (Figure A2). It should be noted that the current year 2000 CMSA does not include 3 towns (New Durham, Middleton, and Strafford) that are part of the 1-hour ozone Serious nonattainment area. Therefore, even EPA's presumptive norm of CMSAs would not be fully inclusive of existing Serious nonattainment areas in New Hampshire. Table 2 summarizes the reasoning behind the exclusion of each town (usually low emissions and population). Bow, which is outside the CMSA, was also excluded, because the power plant in that town is already maximally controlled for oxides of nitrogen ("NOx") through the use of selective catalytic reduction on both of its boilers (as part of the NOx Budget Rule in an approved state implementation plan revision). Overall, the New Hampshire proposal covers about 75% of the area of the New Hampshire portion of the Boston-Lawrence-Worcester CMSA ("NH-CMSA"), accounts for about 92% of its

population, and most importantly, 93% of its NOx emissions (Figure A3). Virtually all of the fastest growing towns from the NH-CMSA are included in the New Hampshire proposal.

Beyond the steps recommended by EPA's guidance document (*Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS*, May 1999), New Hampshire also performed back-trajectory analyses for all of the 1- and 8-hour ozone exceedances for southeastern Massachusetts and throughout the state of Maine. Figure A4 shows minimal connection of New Hampshire with any of the exceedances in southeastern Massachusetts. Of the trajectories that passed over New Hampshire, virtually all of them originated in the Ohio River Valley and clearly were saturated with pollutants prior to reaching the area. Figure A5 shows that many trajectories passed over the southeastern portion of New Hampshire, and thus New Hampshire sources may be contributing to the exceedances in southern Maine to a degree. In most cases, these trajectories also passed over the large Boston and New Your City urban areas or the Ohio River Valley region. Figure A6 shows that most of the airflows leading to exceedances in the Acadia National Park area and beyond actually bypass New Hampshire, taking a fairly direct route over the Gulf of Maine from the Boston and New York City areas. Like in Figure A5, there are several trajectories that cross New Hampshire from northwest to southeast as part of a longer trajectory originating in the Midwest.

Because of the fundamentally different airsheds, it would be unacceptable to New Hampshire to have its emissions linked to any of the monitors in Barnstable, Bristol, or Plymouth counties located along the Southeastern coast of Massachusetts where the frequent ozone violations are caused by transport from New York City and beyond, not by New Hampshire. Based on modeling and common sense, further controlling emissions in New Hampshire would do nothing to reduce ozone at these monitors. Massachusetts has expressed its preference to keep these monitors within the one single nonattainment area that includes Boston and the rest of Eastern Massachusetts. To honor their preference, New Hampshire requests that the southern boundary for the New Hampshire-Maine area be established at the Massachusetts / New Hampshire state boundary. If for some reason the Boston urban area is separated from the Southeastern Massachusetts monitors, New Hampshire would be willing to reconsider linking the areas. None-the-less, New Hampshire will work with Maine and Massachusetts to establish reasonable and nonattainment consistent classifications across the region.

As requested in EPA's guidance (and consistent with how designations are identified in Part 81 of the Code of Federal Regulations), attainment/nonattainment information is provided in Table 3. This information, along with digitized longitude and latitude coordinates for mapping purposes, and electronic versions of this letter and associated maps will be provided.

FIGURE A1. Areas of Violation of the 8-Hour Ozone NAAQS in New Hampshire

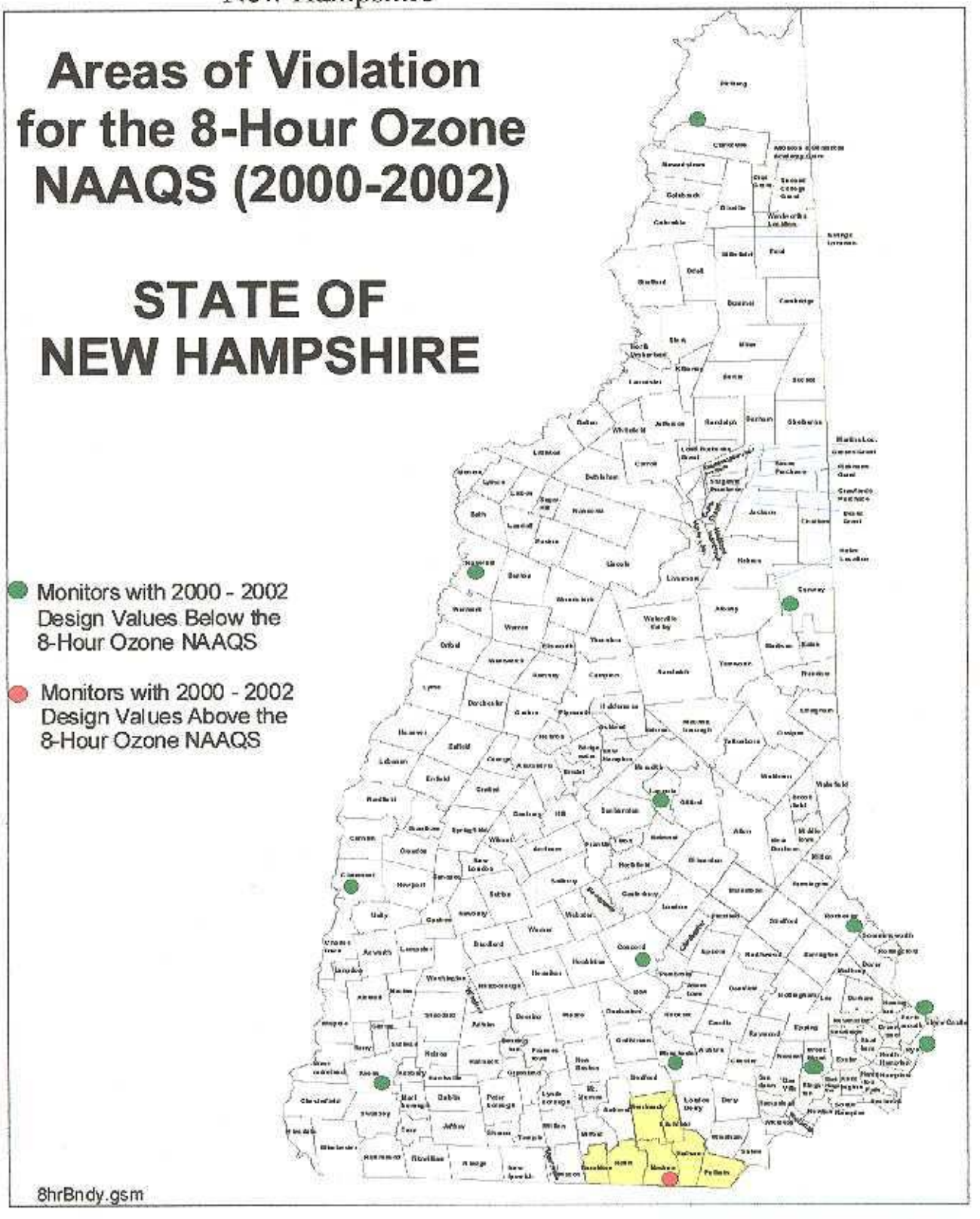


FIGURE A2. Proposed Areas of Nonattainment for 8-Hour Ozone NAAQS Compared to CMSA and Existing 1-Hour Ozone Serious Nonattainment Area Boundaries in New Hampshire

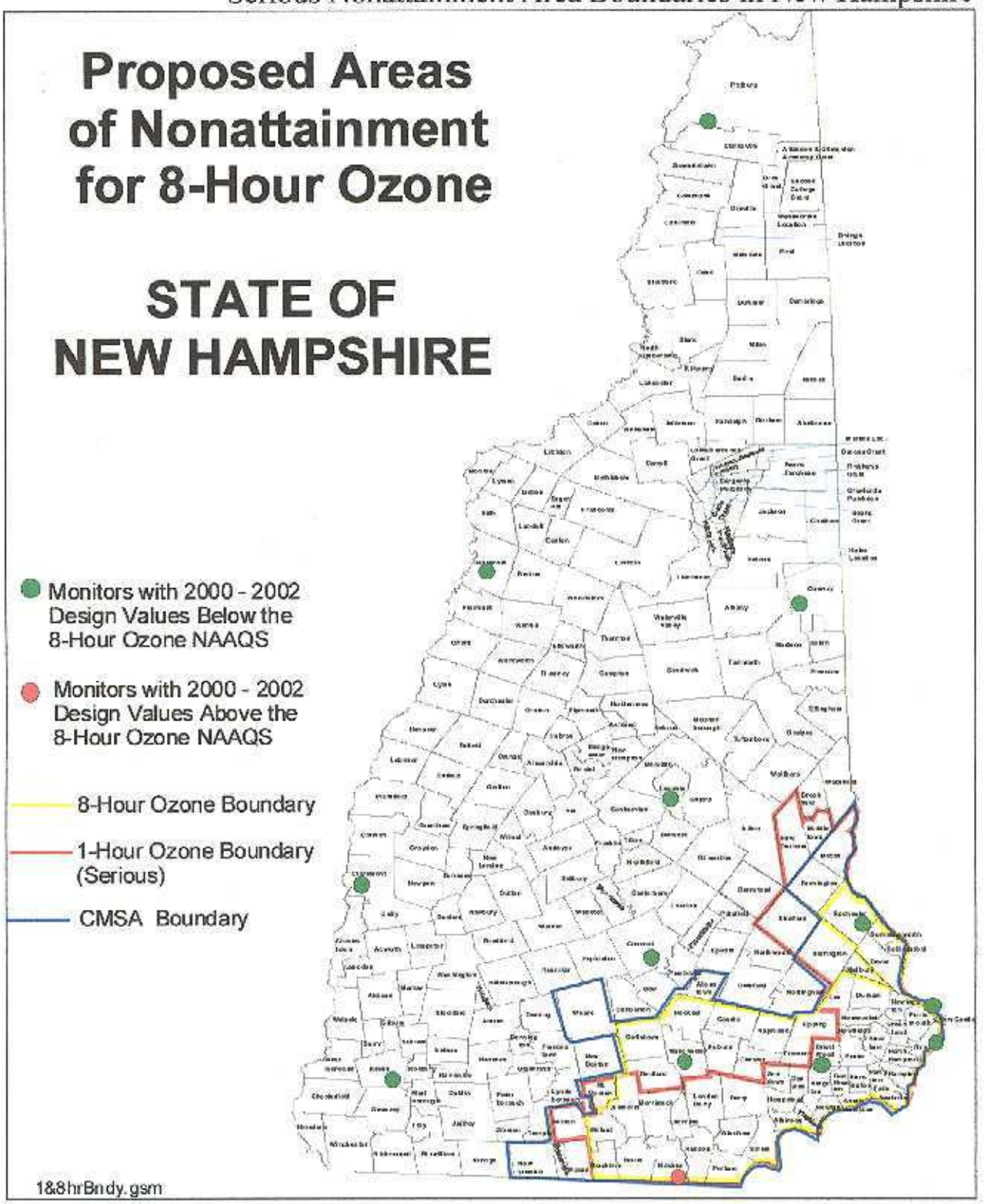


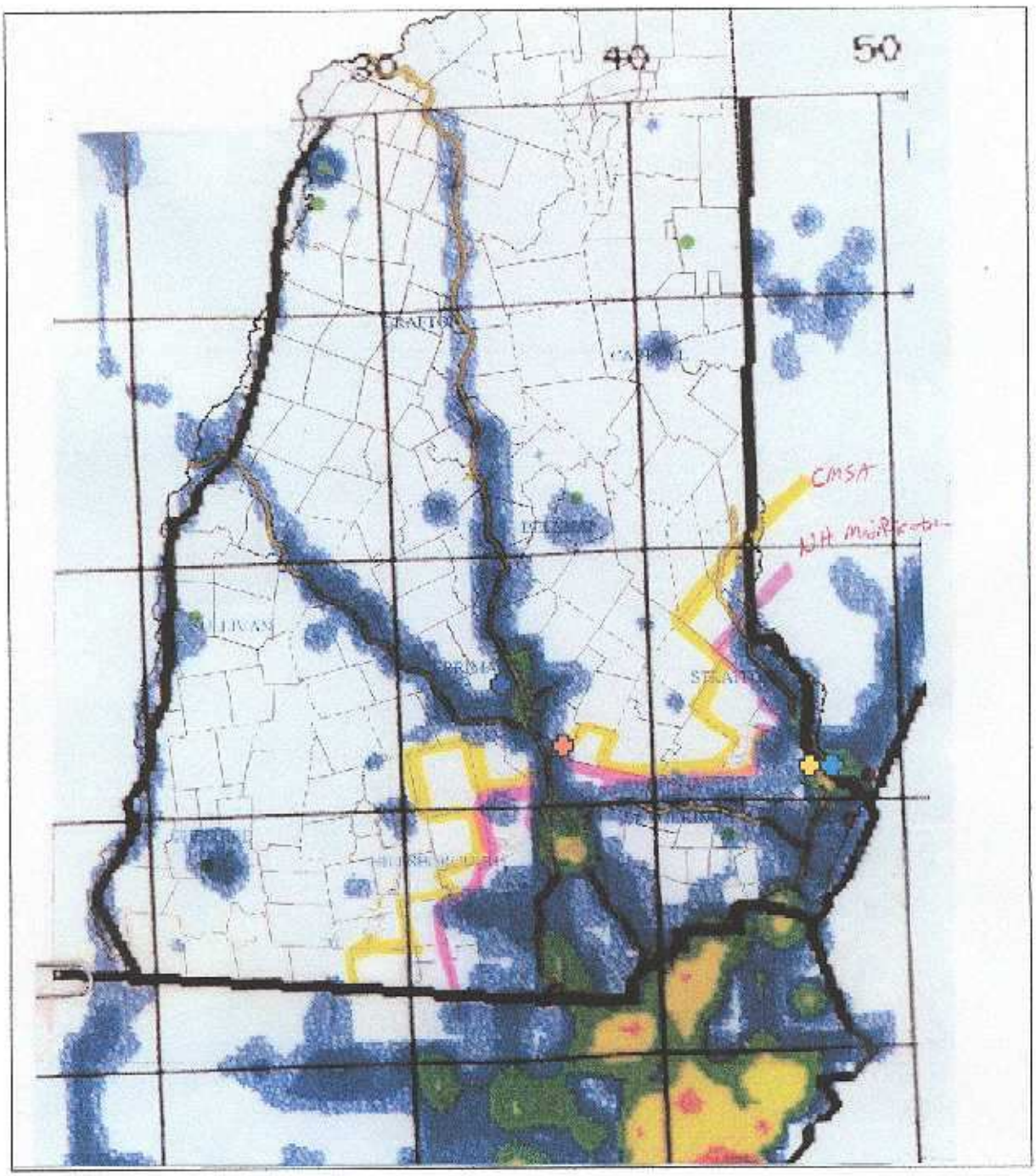
TABLE 2. Towns in the New Hampshire Portion of the CMSA that are Not Included in the Recommended New Hampshire Area of Influence

County Town	1990 Census Pop.	2000 Census Pop.	Growth Rate (%/yr)	2000 Pop. Density (#/sqmi)	NOx Emissions* (Percent of NH-CMSA)	Notes**
State Totals	**1,109,252**	**1,235,786**	**1.14**	**137.4**	--	--
Hillsborough County Totals	*335,838*	*380,841*	*1.34*	*434.2*	--	--
Greenville	2,231	2,224	-0.03	323.4	0.4%	Low population and emissions. No growth.
Mason	1,212	1,147	-0.54	47.8	0.5%	Low population and emissions. No growth.
Mt. Vernon	1,812	2,034	1.23	120.9	0.5%	Low population and emissions.
New Ipswich	4,014	4,289	0.69	131.0	0.4%	Remote and low emissions.
Weare	6,193	7,776	2.56	131.6	1.3%	Remote and low emissions.
Wilton	3,122	3,743	1.99	146.2	0.6%	Low population, growth, and emissions.
Merrimack County Totals	*120,240*	*136,225*	*1.33*	*145.9*	--	--
Allenstown	4,649	4,843	0.42	236.7	1.4%	Low growth and emissions.
Bow (Not part of NH-CMSA)	5,500	7,138	2.98	253.4	Not part of NH-CMSA	Remote, commuting patterns primarily to the north, power plant maximally controlled.
Strafford County Totals	*104,233*	*112,233*	*0.77*	*305.7*	--	--
Barrington	6,164	7,475	2.13	160.1	0.6%	Remote and low emissions.
Farmington	5,739	5,774	0.06	158.2	1.0%	Remote, low growth and emissions.
Lee	3,729	4,145	1.12	207.4	0.2%	Low population and emissions.
Madbury	1,404	1,509	0.75	130.7	0.2%	Low population and emissions.
Milton	3,691	3,910	0.59	118.3	1.1%	Low population and emissions.

* - NOx emission estimates are based on the New England 1-hour ozone photochemical modeling domain 1999 emission inventory.

** - All towns listed below have low population densities typical of rural communities.

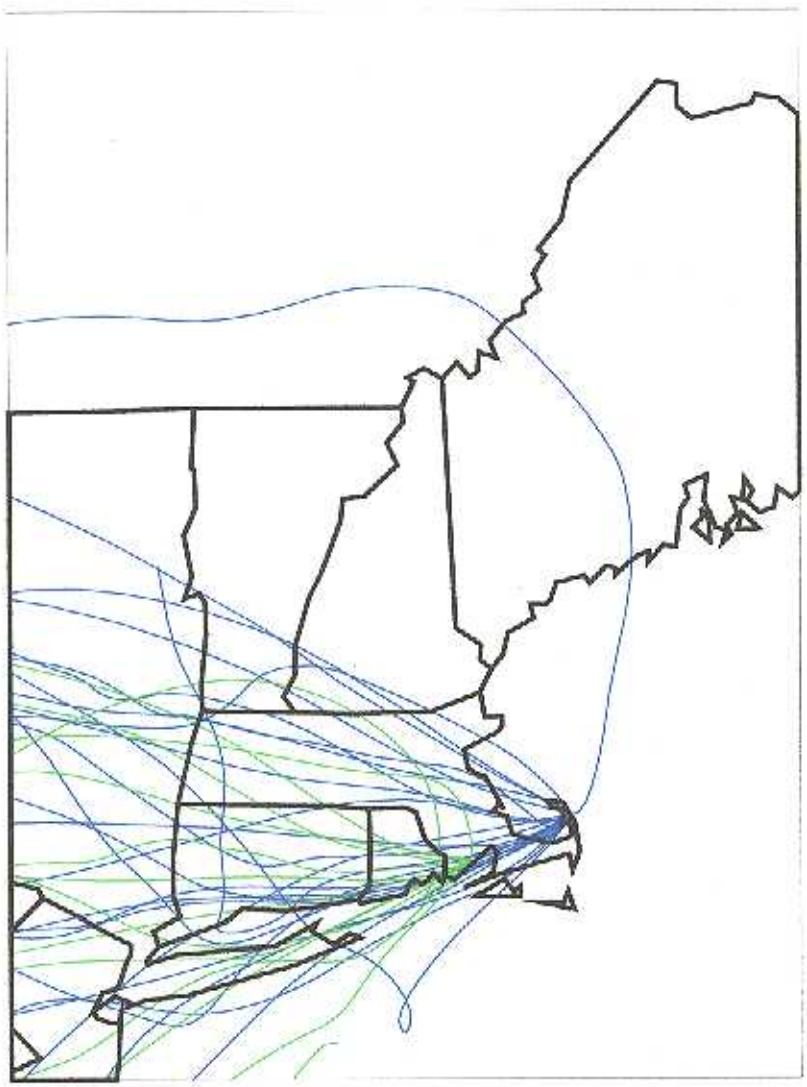
FIGURE A3. New Hampshire-NOx Emission Density



Relative geographic emission density estimates are based on New England Domain 1-hour ozone photochemical modeling inventories.

FIGURE A4. Back Trajectories for 8-Hour Exceedance Days for Southeastern Massachusetts Locations (2000-2002)

Back Trajectories for Ozone Exceedance Days in Massachusetts (2000-2002)



Based on HYSPLIT 4.0

NHDES
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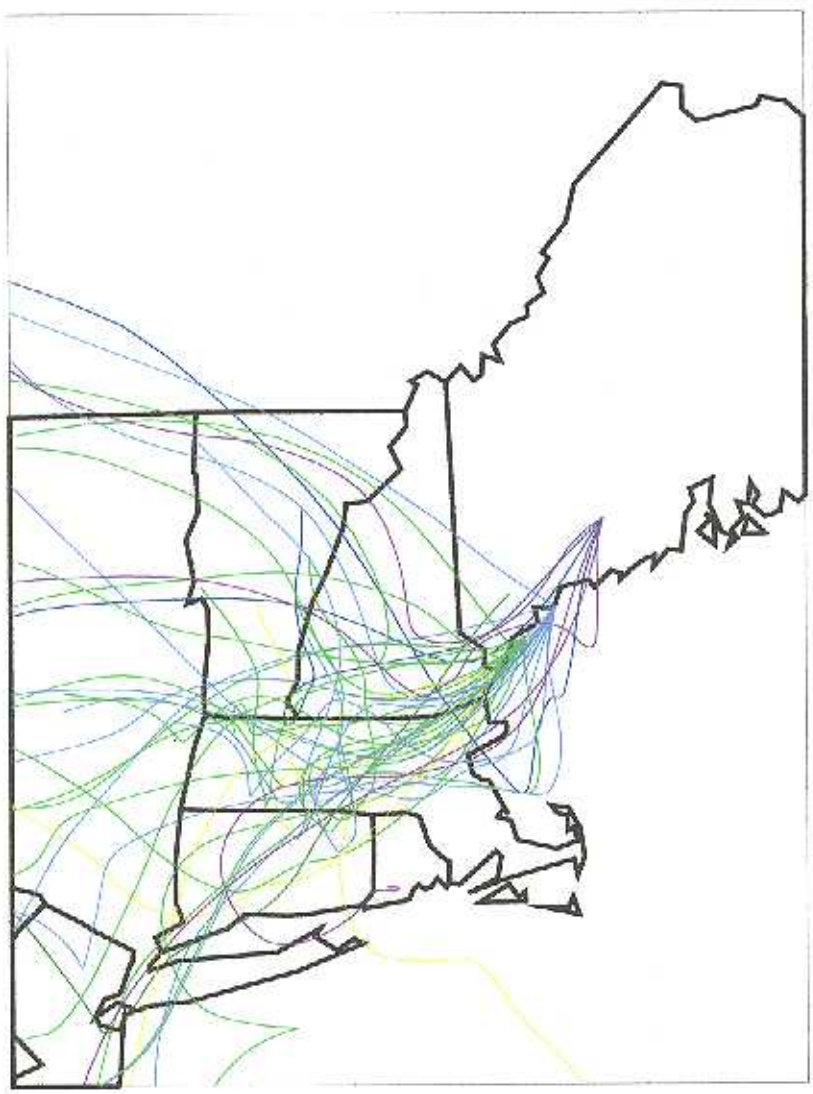
MASS.SRF

FIGURE A5. Back Trajectories for 8-Hour Exceedance Days for Southern Maine Locations (2000-2002)

Back Trajectories for Ozone Exceedance Days in Maine (2000-2002)

Includes Six Sites in Gardiner, Cape Elizabeth, West Buxton, Kennebunkport, and Kittery



Based on HYSPLIT 4.0

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FIGURE A6. Back Trajectories for 8-Hour Exceedance Days for Northern Maine Locations (2000-2002)

Back Trajectories for Ozone Exceedance Days in Maine (2000-2002)

Includes Six Sites in Holden, Acadia, Castine, and Port Clyde

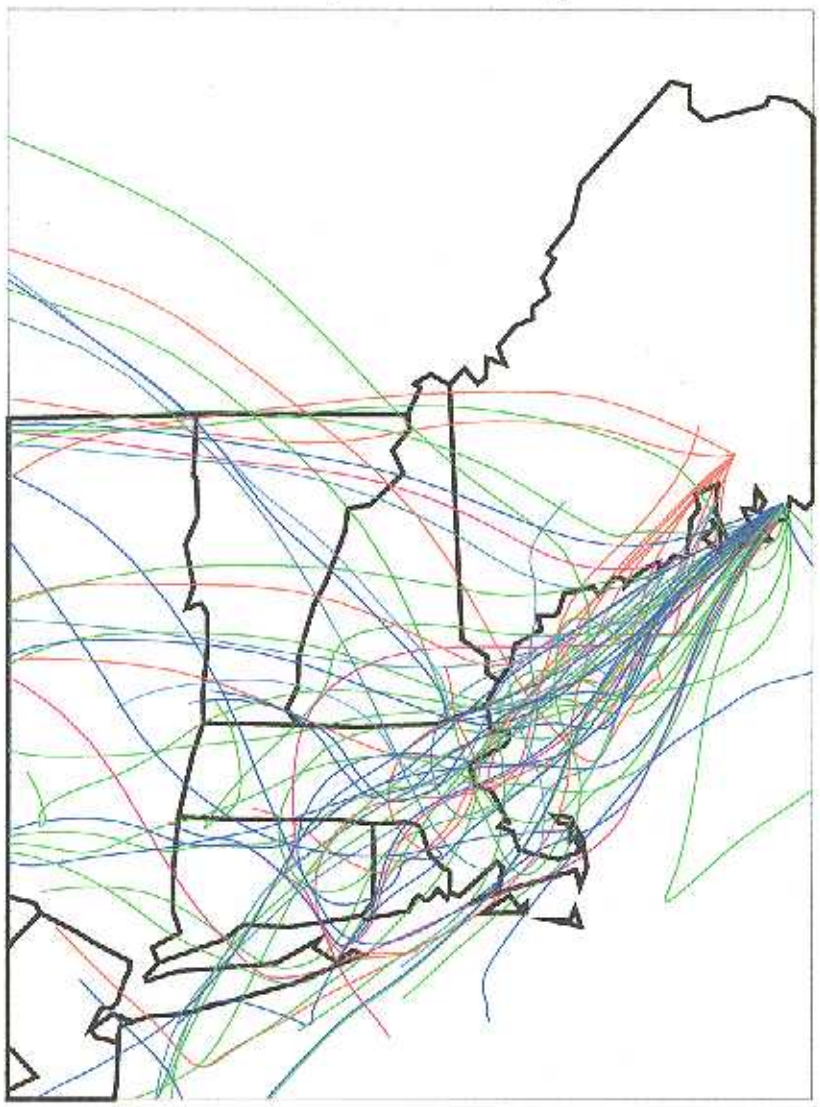

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TABLE 3. Proposed Designations of Areas of 8-Hour Ozone NAAQS Nonattainment in New Hampshire

NEW HAMPSHIRE – OZONE (8-HOUR STANDARD)

Designated Area	Designation Type	Classification Type
New Hampshire Nonattainment Area:	Nonattainment	
Hillsborough County:		
Includes only the following towns:	Nonattainment	
Amherst		
Bedford		
Brookline		
Goffstown		
Hollis		
Hudson		
Litchfield		
Manchester		
Merrimack		
Milford		
Nashua		
Pelham		
Merrimack County:		
Includes only the following towns:	Nonattainment	
Hooksett		
Rockingham County:		
Includes only the following towns:	Nonattainment	
Atkinson		
Auburn		
Brentwood		
Candia		
Chester		
Danville		
Derry		
East Kingston		
Epping		
Exeter		
Fremont		
Greenland		

TABLE 3. Proposed Designations of Areas of 8-Hour Ozone NAAQS Nonattainment in New Hampshire (Continued)

NEW HAMPSHIRE – OZONE (8-HOUR STANDARD)

Designated Area	Designation Type	Classification Type
Hampstead		
Hampton		
Hampton Falls		
Kensington		
Kingston		
Londonderry		
New Castle		
Newfields		
Newington		
Newmarket		
Newton		
North Hampton		
Pelham		
Plaistow		
Portsmouth		
Raymond		
Rye		
Salem		
Sandown		
Seabrook		
South Hampton		
Stratham		
Windham		
Strafford County:		
Includes only the following towns:	Nonattainment	
Dover		
Durham		
Lee		
Rochester		
Rollinsford		
Somersworth		
Rest of State	Attainment	