

**International Air Quality
Advisory Board**



**Report Card
to the
International
Joint
Commission**

April 2002

**Supplement to the
Special Report on
Transboundary Air Quality**

FOREWORD

The following Report Card presented by the International Air Quality Advisory Board to the International Joint Commission is designed to provide an update on air quality issues in the transboundary region since the IAQAB 1998 Special Report on Transboundary Air Quality Issues (henceforth referred to as the Special Report). This document describes subsequent actions by governments germane to each of the Board's recommendations in the Special Report, with further commentary by the Board. An appendix, providing a further level of detail on selected issues, is also attached.

The Special Report deals with the following nine themes:

- I. Seamless Border
- II. Nitrogen Oxides
- III. Continental Issues – Persistent Toxic Substances
- IV. Monitoring and Modeling
- V. Regional Issues
- VI. Harmonization and Standard Setting Process
- VII. Collaboration with other Organizations
- VIII. Surveillance Issues
- IX. Emerging and Anticipatory Issues

The Board proposes to use this report card format as one approach for future communication between the Board and the Commission. The Report Card is meant to provide a concise and timely update on transboundary air quality issues and recent government activities to the Commission between the more comprehensive formal reports of the Board.

I. SPECIAL TRANSBOUNDARY ISSUE: Seamless border

THE BOARD RECOMMENDED:

- The Commission propose that the border region be segmented into Transboundary Air Pollution Regions (TAPTRs);
- The Commission advocate the generation of common harmonized data sets, and
- The Board continue to identify source regions that contribute significantly to transboundary pollution, particularly of persistent toxic substances.

SUBSEQUENT ACTION:

- The Board notes that the Ozone Annex under the recent US/Canada Air Quality Agreement report designates a transboundary area including central and southern Ontario and southern Quebec and 18 US states and the District of Columbia.

BOARD COMMENT:

The Board commends the Governments on the designation of a TAPTR under the Ozone Annex, but awaits further focused action on co-ordinated PM data sets. The scope of interest should be extended to the Alaska/Yukon border. Further attention should also be focused on global transport of pollutants, with specific attention to transpacific transport.

CONTINUED PROGRESS NEEDED

II. SPECIAL TRANSBOUNDARY ISSUE: Nitrogen oxides – The pivotal pollutant?

THE BOARD RECOMMENDED:

- Both countries continue monitoring of nitrogen oxide (NO_x) emissions, ambient air concentrations and deposition;
- Both countries expand monitoring and process research to better understand the transformation mechanism to ozone and particulate matter, to deposition of nitrogen species in acid rain, and to excess nutrient loadings; Both countries devote resources to further research and monitoring of sensitive endpoints affected by NO_x; and,
- In any development of seasonal control strategies, governments explicitly recognize their limitations to address acidification and eutrophication.

SUBSEQUENT ACTION:

- Both countries continue to pursue further NO_x reductions through replacement of coal by natural gas at utilities and other large point sources;
- Seasonal control strategy (ozone) under development;
- More stringent auto emission limits in place or under development;
- NARSTO actions and NOAA coastal zone activity.

BOARD COMMENT:

The Board notes that total annual emissions of NO_x have remained relatively constant over time, notwithstanding the extended use of natural gas and further NO_x controls on utilities and other large sources. Assessment of the total environmental impact of emission control systems for NO_x reduction at utilities (e.g. ammonia generation) appears necessary. Seasonal NO_x controls will not address acidification or eutrophication concerns. Further reductions in vehicle emissions are warranted, as growth in vehicle use offsets more stringent motor vehicle emission standards. Minor progress has been made, however large emissions reductions over broad geographical scales are needed. In the longer term, non carbon based forms of energy production must be considered.

SIGNIFICANT EFFORT MADE BUT CURRENT PRACTICES NOT SUSTAINABLE

III. SPECIAL TRANSBOUNDARY ISSUE: Continental issues – Persistent toxic substances (PTSs)

THE BOARD RECOMMENDED:

- The Commission closely track the implementation of the Great Lakes Binational Toxics Strategy at regular intervals, and review progress made in completing specific elements.
- Dioxin and mercury to be included in IADN contaminant monitoring.

SUBSEQUENT ACTION:

- Board supported an ongoing review of progress under the BTS by the IJC Water Quality Board
- Largely as a result of modeling activities of the Board and the CEC, higher quality bilateral emission inventories have been developed for dioxin, cadmium and mercury
- IJC has recommended extension of IADN contaminant sampling to include mercury and dioxin

BOARD COMMENT:

Review of Binational Strategy valuable; linkages under the Great Lakes Water Quality Agreement with the CEC should be strengthened to meet the BTS/GLWQA goals. For some contaminants, continental and global sources need further consideration.

CONTINUED VIGILANCE REQUIRED

IV. SPECIAL TRANSBOUNDARY ISSUE: Monitoring and modeling

THE BOARD RECOMMENDED:

- Both countries address and eliminate gaps in available data on levels of fine particulate matter and ozone in the Transboundary Region through a co-ordinated monitoring strategy there;
- Both countries develop a number of sites to co-locate instruments for intercomparison of measurements including placement of a fine particulate co-located site in Detroit-Windsor region;
- Both countries place each of their chemical and meteorological modules on the Models-3 system so that both countries can develop the best modeling tool;
- Both countries expand routine monitoring capabilities for trace quantities of substances, such as those measured by the Integrated Atmospheric Deposition Network, to include measurements immediately downwind of urban areas;
- Both countries develop comparable and compatible high-quality and publicly accessible binational emissions inventories.

SUBSEQUENT ACTION:

- Joint fine PM monitoring is occurring at Sault Ste. Marie and CARE site in Toronto, and Maritime Provinces and States
- IJC 10th Biennial Report recommended extension of IADN sampling to mercury and dioxin

BOARD COMMENT:

- **Extended mercury monitoring, particularly of dry deposition, is needed**
- **The Canadian government should seek involvement in the newly-established US National Dioxin Atmospheric Monitoring Network**
- **Extension of IADN sites to estimate the urban contribution and measure other contaminants (dioxin) necessary (IJC Tenth Biennial Report)**
- **MOU on model comparisons is under development**

GOOD PROGRESS ON PARTICULATE MATTER; MORE ACTION NEEDED ON PERSISTENT TOXICS MEASUREMENT AND INVENTORY WORK

V. SPECIAL TRANSBOUNDARY ISSUE: Regional issues

THE BOARD RECOMMENDED:

- Both countries ensure that any regional control strategies to limit transboundary air pollution be based on source transport and receptor regions.

SUBSEQUENT ACTION:

- Evolution of OTAG and the Ozone Annex under the US/Canada AQ Agreement is consistent with this recommendation
- Some transboundary co-ordination continues among the federal governments and the State of Washington and the province of British Columbia
- In 1998, Conference of New England Governors and the Eastern Canadian Premiers undertook regional action plan on climate change, whose development currently continues.
- In March 2002, once the Supreme Court upheld the right of the US EPA to promulgate proposed standards for fine particulate (PM_{2.5}) and ozone while reconsidering their implementation, the D.C. Circuit Court of Appeals subsequently rejected all remaining claims against this regulatory activity.
- The USEPA can now proceed with implementation of a new 24 hour ambient air standard for PM_{2.5} of 65 µg/m³, and a revised ozone standard of 0.08 ppm 8 hour average.
- These standards were proposed in July of 1997; several interests appealed their implementation; in 1999, the D.C. Circuit Court of Appeals declared the CAA an unconstitutional delegation of legislative power; the US EPA appealed to the Supreme Court, who reversed that finding and also referred elements of the case back to the D.C. Circuit Court of Appeals for review.

BOARD COMMENT:

- **Canada US Accord Ozone Annex; a significant and positive step**
- **Critical need to reexamine regional issues in light of energy deregulation and shifting demand**
- **More complete integration of regional transboundary Binational Toxic Strategy needs to occur**
- **Binational emission quantification needed to support transport/receptor modeling**

POSITIVE STEPS YET CONTINUED PROGRESS NEEDED

VI. SPECIAL TRANSBOUNDARY ISSUE: Harmonization and standard setting processes

THE BOARD RECOMMENDED:

- That the Commission advocate appropriate inclusion of experts from both countries in the development of air quality standards and criteria for each country.

SUBSEQUENT ACTION:

- Formal exchange of expertise has not occurred

BOARD COMMENT:

- **Government jurisdictions setting air quality criteria should do so in a transparent manner with broad bi-national consultation.**
- **Governments should consider transboundary issues in the implementation of standards and management of air quality.**

DEFICIENT

VII. SPECIAL TRANSBOUNDARY ISSUE: Collaboration with other organizations

THE BOARD RECOMMENDED:

- The Commission maintain a dialogue with the Commission for Environmental Cooperation (CEC); and,
- The Commission consider opportunities for interaction with the United Nations Economic Commission for Europe (UNECE) to ensure their work reflects North American practices, and to consider which European approaches could be applicable to North America.

SUBSEQUENT ACTION:

- IAQAB linkage with the CEC for Mercury Workshop and HYSPLIT modeling of mercury transport and deposition

BOARD COMMENT:

- **Linkage with the CEC allowed Board to influence actions on deposition and emission inventory activities.**
- **Continued linkages (CEC/POPs), appropriate to address continental and global sources**

GOOD

VIII. SPECIAL TRANSBOUNDARY ISSUE: Surveillance issues

THE BOARD RECOMMENDED:

- The Commission ensure that any PM_{2.5} monitoring network established by the United States can be compared with monitoring done in Canada; and,
- The Commission urge both countries to determine appropriate endpoints and indicators of air quality and to conduct periodic surveys of all significant air pollution receptors.

SUBSEQUENT ACTION:

- As noted, a joint PM monitoring exercise is underway; its impact on comparison of routine data in both countries should be tracked
- Development of SOLEC indicators continues; AQ segment needs improvement.

BOARD COMMENT:

- **Progress made on monitoring comparison**
- **Joint data comparisons effective**
- **Comments provided to IJC on SOLEC AQ indicators**

CONTINUE TO ENCOURAGE

IX. SPECIAL TRANSBOUNDARY ISSUE: Emerging and anticipatory issues

THE BOARD RECOMMENDED:

- That the Commission ensure the development of a uniform standard throughout both countries for sulfur content in gasoline of 30 ppm annual average, with a maximum level of 80 ppm.
- In IAQAB Progress Report 25 (April 2000) the Board recommended that the United States and Canada substantially limit the sulfur content of diesel fuel to permit deployment of advanced auto emission control systems for NOx and particulate matter.

SUBSEQUENT ACTION:

- Sulfur in gasoline regulations advanced in both US and Canada
- December 1998, the U.S. EPA announced a limit on the maximum sulfur content in gasoline; in 2004, an average standard of 120 ppm (max 300 ppm); by 2006, an average of 30 ppm (max 80 ppm)
- June 1999, Canada announced its sulfur regulations: by July 1, 2002 to December 31, 2004 average will be 150 ppm, and by January 1, 2005 an average of 30 ppm (max 80 ppm)

BOARD COMMENT:

GOOD, BUT FURTHER FOCUS NEEDED ON AMMONIA LOADING, MTBE USAGE AND OTHER ENERGY ISSUES

APPENDIX

I. SPECIAL TRANSBOUNDARY ISSUE: Seamless Border

SUBSEQUENT ACTION:

The Board notes that the recent Ozone Annex of the US/Canada Air Quality Agreement designates a transboundary area including central and southern Ontario and southern Quebec and 18 US states and the District of Columbia.

In December 2000, Canada and US signed the Ozone Annex to the Canada-US Air Quality Agreement.

Canadian Commitments:

- Annual caps by the year 2007 of 39 kilotonnes of NO_x emissions from fossil-fuel power plants in central and southern Ontario and 5 kilotonnes of NO_x in southern Quebec.
- National emission reduction regulations aligned with those in the United States for cars, vans, sport utility vehicles and light duty trucks; off-road gasoline utility engines, diesel engines, outboard motors and fuel standards.

US Commitments:

- Reduce summertime NO_x emissions by 35 percent by 2007 in the US transboundary region.
- Reduce NO_x and VOC emissions from on-road and off-road vehicles and off-road engines and fuels.
- Reduction of VOC emissions from solvents, coatings and consumer and commercial products.

Canada's Implementation of the Ozone Annex (Environment Canada, 2001)

Canada's Ozone Management plan was announced in February 2001 and will focus on transportation, monitoring and reporting.

Transportation

Canada will implement new emissions standards for vehicles, engines and alter the fuels that power them. The current vehicle standards will be replaced with new standards, comparable to those in the United States, that will reduce NO_x emissions from passenger vehicles by 88 percent

and up to 95 percent for light-duty trucks (including SUV's). By 2002 Canada will develop on-road vehicle and engine regulations in alignment with the US EPA regulations. These regulations will be phased in through the 2004 model year. An interim agreement with vehicle manufacturers has been developed to lower emissions for model years 2001-2003. In 2001, a code of heavy-duty vehicle inspection and maintenance programs will be developed.

Monitoring

Canada will enhance its monitoring along the Canada-US border through expansion and refurbishing the federal and provincial networks of stations across Canada. The National Air Pollution Surveillance (NAPS) Network and the Canadian Air and Precipitation Monitoring Network (CAPMoN) are Canada's two air-monitoring networks. Canada will refurbish approximately 50 critical monitoring stations, establish 10 new monitoring stations and replace aging instrumentation throughout the network.

The Board has also been briefed on air quality monitor research programs on the Pacific coast adjacent to the boundary, which are focused on determining the nature and extent of transpacific transport of particulate matter and ozone, with some consideration of persistent toxic substances, particularly mercury. In the next few years, these programs should yield a first estimate of the magnitude of this transport of both common and hazardous air pollutants.

Reporting

The Canadian government will invest in the expansion of the National Pollutant Release Inventory (NPRI). The NPRI is a legislated inventory to which all facilities that manufacture, process or use more than the threshold amounts of 268 substances on the NPRI list must report releases. The NPRI list is to be expanded in 2002 to include ozone precursors.

Mounting evidence exists to demonstrate the harmful health effects of smog (air pollution)

There is a consensus that smog episodes worsen respiratory capability in sensitive segments of the human population (particularly children and the elderly). However, new studies demonstrate a potential causal relationship between smog and incidences of asthma (Mittelstaedt, 2002 and Kaiser, 2001). Scientists have not ascribed this reaction to any single pollutant but have shown links between increased air pollution (ozone, PM, nitrogen oxide mixtures) and elevated asthma rates. In addition, the link between smog and increased mortality rates has been reaffirmed. A new study also demonstrated that this mix of pollutants is linked to an increased risk of heart attacks for more vulnerable segments of the population (Brook *et al.*, 2002).

The University of California conducted a ten-year study demonstrating a causal link between ozone and asthma (Mittelstaedt 2002). Children from six California communities where higher than average ozone concentration prevailed were compared to children from six California communities with below average ozone concentration. Medical histories were tracked over five years and the role of increased outdoor activity was also investigated by evaluating children who played three or more sports. The study found higher development of asthma in the population of children residing in the high smog communities and particularly among those who were active within those communities. The more active children appear to be more at risk as vigorous exercise can increase their normal uptake of air into the lungs by a factor of up to 17.

Pulmonary toxicologists, also at the University of California, continued working with infant monkeys to further explore the potential causal relationship between ozone and asthma (Kaiser 2001). These very young monkeys were exposed to either ozone alone, ozone with dust mites or dust mites alone. Researchers found the most dramatic response with ozone alone. After 5 months of exposure in a 5 day on, 9 day off cycle meant to simulate ozone episodes, the monkeys developed two thirds the amount of airways branches as the control monkeys.

At the University of Toronto, a 1-year study demonstrated a link between urban air pollution and artery constriction (Brook *et al.*, 2002). This experiment involved 25 volunteers breathing in air representative of air pollution incidents in southern Ontario for two hours in an inhalation chamber. Ultrasounds were performed on the volunteers' brachial artery before and after exposure. The results demonstrated a decrease in diameter of between two and four per cent. The researchers reason that the constriction would also be applicable throughout the circulatory system, including the blood vessels around the heart. This constriction would not likely have an impact on healthy individuals in the short term; however, the impact could be significant for individuals with existing heart or circulatory difficulties.

II. SPECIAL TRANSBOUNDARY ISSUE: Nitrogen oxides – The pivotal pollutant?

SUBSEQUENT ACTION:

NARSTO actions and NOAA coastal zone activity.

NARSTO, a tri-national public/private alliance, was created and is supported by Canada, Mexico and the United States. Its mission is to plan and facilitate policy-relevant scientific research to provide data and information for effective strategies for management of local and regional ozone and fine particulate matter pollution episodes. NARSTO reviews and supports work in four broad technical program areas: Atmospheric Chemistry and Modeling Research, Emissions Research, Observations Research and Integrated Analysis and Assessment.

The US National Oceanic and Atmospheric Administration (NOAA) is active in the determination

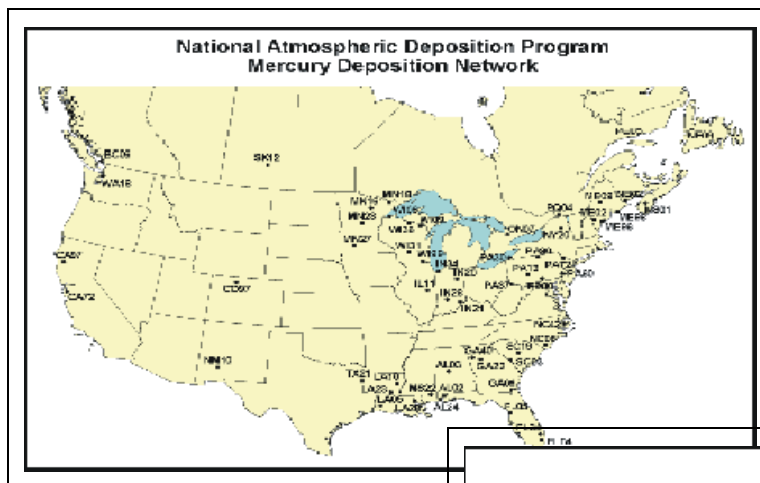
of nitrate loading to Chesapeake Bay and the Gulf of Mexico. In both cases, while a substantial portion of the contribution is water borne, atmospheric deposition is a significant input.

Mobile Sources

There are suggestions that the combination of reformulated gasoline and catalytic converters may contribute to the rise in ammonia emissions. The reports (American Chemical Society, 2000) claim that current emissions from automobiles are contributing double the ammonia to the atmosphere than those from livestock.

The population of Sport Utility Vehicles (SUV's) in the United States has doubled between 1992 and 1997 (Gallon Environment Letter, 2000). In part, this has contributed to a decline in fuel efficiency from 25.9 miles per gallon (mpg) in 1988 to 23.8 mpg in 1999. SUV's are considered trucks and are subject to less stringent fuel efficiency standards than cars. The SUV's and light truck CAFE (Corporate Average Fuel Economy) standard is in the vicinity of 20.7 mpg, whereas car fleets are to meet a standard of 27.5 mpg.

IV. SPECIAL TRANSBOUNDARY ISSUE: Monitoring and modeling



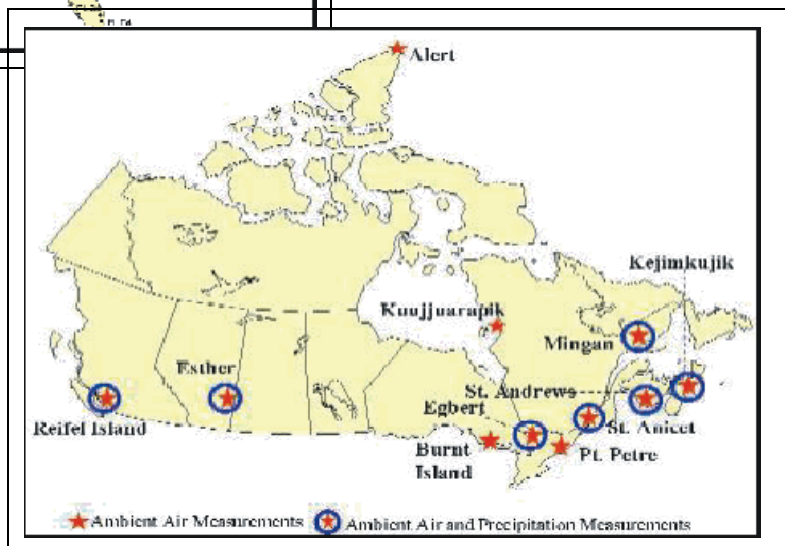
**BOARD COMMENT:
Extended mercury monitoring is needed.**

Atmospheric deposition is a significant pathway for contamination of the ecosystem by mercury. Currently, the Mercury Deposition Network (MDN) is monitoring wet deposition at over

50 sites in the US and Canada.

The CAMNet effort is currently monitoring ambient air concentrations of elemental mercury at a number of locations in Canada.

Canadian Atmospheric



Mercury Measurement Network

However, dry deposition of mercury is also important. Reactive gaseous mercury (RGM) is a key component of both dry and wet deposition. Thus determinations of ambient concentrations of RGM are also required. At the moment there are only a small number of routine RGM measurements, due in part to sampling and analytical difficulties. There is a need for a network dedicated to speciated ambient air measurements of RGM, particulate mercury and elemental mercury, with publicly accessible data (Cohen 2002).

Mercury emissions from the utilities sector are currently being considered for regulation in the US. The President has proposed the multi-pollutant Clear Skies initiative and the US EPA is considering application of Maximum Available Control Technology requirements (MACTs) for the utilities sector. An overall floor is also being considered for the initial regulation, with further specifics to follow (Brown 2002).

The Canadian Council of Ministers of the Environment (CCME) is currently developing a Canada Wide Standard for mercury emissions from the Electric Power Generation Sector, which would follow completion of the Base Smelting sector standard in 2000.

BOARD COMMENT:

Extension of IADN sites to estimate the urban contribution and measure other contaminants (dioxin) necessary (IJC Tenth Biennial Report)

One of the objectives of the current IADN network, which is among the best air toxics monitoring programs in North America, was to be indicative of background concentrations and loadings of persistent toxics to the Great Lakes. However, recent intensive studies indicate inadequacies in using IADN to estimate lakewide loadings for some persistent toxics to that region.

The network combines both long-term measurements at several (satellite) stations of some limited list of contaminants with those from master research stations with a more comprehensive contaminant suite and measurements (master stations), yielding speciation of the chemicals and/or a finer temporal resolution.

Basic (satellite) measurements can be indicative of large-scale trends in deposition, can support ongoing control legislation, and can link to ecosystem effects studies. Intensive (master station) measurements give an understanding of the processes underlying the measurements made in the basic program as well as those derived from other media. Research measurement programs also support the transfer of technology to the broader scientific community, resulting in incremental enhancements to the basic measurement programs.

Atmospheric modeling typically requires one of two types of monitoring data: short-term samples adequate for calculation of source-receptor relationships, or longer resolution samples for the computation of annual loadings. Many current modeling efforts require additional monitoring data, beyond that provided by the current IADN sampling schedule of one day in fourteen, for verification. Work under the Lake Michigan Mass Balance has demonstrated that many models cannot use the IADN data alone for verification. Models such as the Cohen application of the HYSPLIT model, which require accurate estimates of annual loadings, would not have reliable estimates for comparison purposes.

A program of daily measurement of all crucial species over a full year would be ideal. Practically, two other options would be to measure more days at fewer locations for fewer substances, or obtain an integrated fourteen day sample rather than a sample from just one day in fourteen. The former approach will allow more accurate calculation of source-receptor relationships; the latter, accurate calculation of annual and seasonal loadings.

V. SPECIAL TRANSBOUNDARY ISSUE: Regional issues

SUBSEQUENT ACTION:

In 1998, the Conference of New England Governors and the Eastern Canadian Premiers developed regional action plans for control of mercury and sulfur dioxide emissions and began consideration of a joint regional action plan on climate change, whose development currently continues.

During the annual conference in 2001 the Atlantic Provinces and New England States agreed to direct their governments to reduce overall anthropogenic mercury emissions by a minimum of 75 percent by 2010 (Air Pollution News, 2002). The resolution calls for a re-evaluation of the adequacy of this target in 2005 based on new data and information (Inside EPA 2001).

SUBSEQUENT ACTION:

In March 2002, once the Supreme Court upheld the right of the US EPA to promulgate proposed standards for fine particulate (PM_{2.5}) and ozone while reconsidering their implementation, the D.C. Circuit Court of Appeals subsequently rejected all remaining claims against this regulatory activity.

The USEPA can now proceed with implementation of a new 24 hour ambient air standard for PM_{2.5} of 65 µg/m³, and an annual average standard of 15 µg/m³, and a revised ozone standard of 0.08 ppm 8 hour average.

These standards were proposed in July of 1997; several interests appealed their implementation in court; in 1999, the D.C. Circuit Court of Appeals declared the CAA an unconstitutional delegation of legislative power; the US EPA appealed to the Supreme Court, who reversed that finding and also referred elements of the case back to the D.C. Circuit Court of Appeals for review.

In July of 1997 the US EPA determined that changes to the National Ambient Air Quality Standards (NAAQS) for ozone and particulate matter (PM) were necessary to protect human health and the environment.

Subsequently, the Agency proposed tightening the ozone standard from a 0.12 ppm 1-hour average to 0.08 ppm 8-hour average for both the primary (public health) and secondary (public welfare) standard. The new standard is "concentration-based," calculated from the 3-year average of the annual 4th-highest daily maximum 8-hour ozone concentrations. The old 1-hour standard was not to be revoked until any particular area has met the new standard for 3 consecutive years.

The PM standard was revised through the addition of an **annual** PM_{2.5} (fine particulate) standard of 15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and a new **24-hour** PM_{2.5} standard of 65 $\mu\text{g}/\text{m}^3$. In addition, the current annual PM₁₀ (larger particulate) standard of 50 $\mu\text{g}/\text{m}^3$ would be maintained; however, the 24-hour standard will be changed from the 98th percentile to the 99th percentile concentration based form. Similar alterations were also made to the secondary standard. New rules were also issued in relation to monitoring requirements, and the US EPA is separately proposing rules to improve visibility.

In May of 1999, the US D.C. Court of Appeals responded to a suit (American Trucking Association vs USEPA) over the standards and their implementation. That court declared that the Clean Air Act, as applied "effects an unconstitutional delegation of legislative power," but it supported the science used by the Agency in the development of the PM_{2.5} standard and rejected industry's claim that the US EPA must consider the economic impact of its National Ambient Air Quality Standards (NAAQS). The fine particulate standard was allowed to remain in place, but parties were allowed to oppose implementation, presumably due to the burden placed on sources. It also stated the right of the US EPA to revise the primary ozone standard but ruled that it "cannot be enforced."

The US EPA appealed to the Supreme Court in 2001; that Court unanimously rejected industry's claim that the US EPA must consider cost in setting National Ambient Air Quality Standards (NAAQS) and upheld the constitutionality of the 1970 Clean Air Act provision allowing the US EPA to set NAAQ Standards. The Court also rejected industry's claim that the US EPA cannot require the states to meet a new standard that is more protective than the current 1-hour ozone standard. The Court determined the US EPA has the authority to implement a revised ozone standard; however it must reconsider its plan to do so. The US EPA currently is developing a new implementation plan in consultation with the public.

The Supreme Court also referred the case back to the D.C. Circuit Court of Appeals on issues raised by the plaintiff on which no court ruling was made in May 1999. The D.C. Circuit Court of Appeals ruled in March 2002 that the US EPA "has no obligation either to identify an accurate safe level of a pollutant or to quantify precisely the pollutant's risks." The D.C. Circuit Court of Appeals rejected all remaining challenges contained in the 1997 suit. This decision allows the US EPA to limit pollution levels across the country. Analysts suggest that the ruling would not be appealed due to the preceding broad Supreme Court rulings. The US EPA now must designate areas which do not meet the standards and once this is complete, can then require states to submit

plans detailing how they will achieve the standards.

IX. SPECIAL TRANSBOUNDARY ISSUE: Emerging and anticipatory issues

THE BOARD RECOMMENDED:

In IAQAB Progress Report 25 (April 2000) the Board recommended that the United States and Canada substantially limit the sulfur content of diesel fuel to permit deployment of advanced vehicle emission control system for NO_x and particulate matter.

In January 2001, the US EPA made its final rule to limit emissions from heavy-duty diesel engines and to lower the sulfur content in diesel fuel. Sulfur in diesel fuel is to be reduced from 500 ppm to 15 ppm, a 97 percent reduction, through a phased approach beginning in June 2006. The engine and vehicle standards would apply to the model year 2007 with a flexible phase-in approach between 2007 and 2010. The new standards should reduce emissions of particulate matter and nitrogen oxide from diesel engines by 90 percent and 95 percent respectively. The standards will also seek to reduce emissions of benzene, 1-3 butadiene, formaldehyde, acetaldehyde, acrolein and dioxin (Environment Reporter 2001).

The cleaner fuel is needed to allow for the effective function of pollution reducing technologies on the 2007 model year vehicles. In addition, it will lower the emissions from the balance of the diesel vehicle fleet.

A 1998 consent decree between diesel engine manufacturers and US Department of Justice covers the 2002-2004 model years with restrictions on NO_x and Not-to-Exceed test requirements. However, there is a two year window (2005/06) during which more stringent enforcement may not occur, due to the lead time required to implement the Clean Air Act requirements. The Clean Air Act allows for the states to adopt their own standards with the approval of the USEPA. Recognizing this window, The State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) have drafted a model rule for consideration by the states, based on California's NTE diesel standard as a *de facto* national rule that would close the two-year window. Initially, 20 states indicated intent to adopt the rule; however, in November 2001 two states (New Hampshire and Oregon) have announced otherwise for legal reasons. The adoption of such a rule would be necessary to force diesel engine manufacturers to comply with emissions standards continuously (Inside EPA 2001).

In December 2001, a coalition of industries brought suit against the US EPA in the US Court of Appeals for the District of Columbia with regard to controls on heavy-duty diesel engines and their fuel. The coalition claims the rule was promulgated outside of US EPA's authority. Under the Clean Air Act "that (vehicle emissions control) technology has to be either in or near to being in commerce" by the time the rule is implemented. The coalition claims it is not feasible for the technology to be in use within the time frame of the rule. The positions of all parties were to be argued February 27, 2002. In addition, a coalition of states and localities (STAPPA-ALAPCO) is urging the US EPA to develop similar standards for off-road vehicles (Environment Reporter

2001).

Canada is currently developing heavy-duty diesel engine and diesel fuel regulations in alignment with US EPA regulations. On February, 2001 Minister Anderson published a Notice of Intent on Cleaner Vehicles, Engines and Fuels in the *Canada Gazette, Part I* Final regulations will be published in *Part II of the Canada Gazette* in the summer or fall of 2002. These regulations will impact off-road equipment in addition to all types of on-road vehicles (Stemshorn 2001). The Government of Canada has proposed an initiative in 2001 to develop new regulations to reduce sulfur in on-road diesel fuel to 15 ppm from 320 ppm by 2006.

References

- (2000). SUV's called trucks in order to by pass emissions standards. *The Gallon Environment Letter*, February, 27.
- (2000). Number of SUV's on the road have double between 1992 and 1997. *The Gallon Environment Letter*, February, 27.
- (2001). Diesel fuel, emission rules published, setting stage for actions in court, congress. *Environment Reporter*, **32** (3), 117.
- (2001). States back out of plan to adopt California diesel rule. *Inside EPA*, November 9.
- (2001). States, local agencies support diesel rule, but urge sulfur cuts for nonroad engines. *Environment Reporter*, **32** (50), 2437.
- (2001). Jeffords to introduce legislation capping automobile carbon emissions. *Environment Reporter*, **32** (49) 2390.
- (2001). Providing cleaner air to Canadians. *Environment Canada*, February.
- (2001). Activists blast northeast governors' mercury reduction efforts. *Inside EPA*, August 31.
- (2002). Whitman rejects clean air plan. *The Associated Press*, February 21.
- (2002). Mercury progress review. *Air Pollution News*, **32** February.
- Brook, Robert D.; Jeffrey R. Brook,; Bruce Urch, MSc; Renaud Vincent,; Sanjay Rajagopalan,; and Frances Silverman (2002). Inhalation of fine particulate air pollution and ozone causes acute arterial vasoconstriction in healthy adults. *Circulation*, **105**, 1534-1536.
- Brown, Ellen (2002). Controlling mercury emissions in US - overview. *Presentation at Mercury: Consequences for Environment and Health Workshop, Montreal, Quebec*, February.
- CCME (Canadian Councils of the Ministers of Environment) website. <http://www.ccme.ca>
- Cohen, Mark (2002). The Atmospheric Transport and Deposition of Mercury to the Great Lakes. *Presentation to Science Advisory Board, IJC*, February 28.
- Kaiser, Jocelyn (2001). Toxicologists hit the west coast. *Science*, **292**, 837-838.
- Marsh, Charmayne (2000). Risking ammonia emissions attributes to cars, not livestock. *American Chemical Society*, August 21.

- Mittelstaedt, Martin (2002). Smog linked to asthma in children. *Globe and Mail*, February 2.
- NARSTO (1999). <ftp://ftp.cgenv.com/pub/downloads/NARSTOSummary.pdf>. NARSTO organizational and technical activity summary: Public-Private Atmospheric Research in Support of Air Quality Management. *NARSTO*, September 1999. March 2002.
- Stemshorn, Barry (2001). *Personal correspondence*, May 1.
- US EPA (2001). http://www.epa.gov/airlinks/court_summary.pdf. Whitman v. American Trucking Associations U.S. Supreme Court, Nos. 99-1257, 99-1426 February 27, 2001 Supreme Court Decision on the EPA 's Ozone & Particulate Matter Air Quality Standards. *US EPA*, Feb. 2001. March 2002.
- US EPA (1999). <http://www.epa.gov/ttn/oarpg/gen/courtsum.pdf>. American Trucking Associations, Inc. v. USEPA, Nos. 97-1440 and 97-1441 (D.C. Cir. May 14, 1999) Summary of Decision. *US EPA*, May 1999. March 2002.
- US EPA (1997). http://www.epa.gov/ttn/oarpg/t1/fact_sheets/o3fact.pdf. Fact sheet: EPA's revised ozone standard. *US EPA*, July 1997. March 2002.
- US EPA (1997). http://www.epa.gov/ttn/oarpg/t1/fact_sheets/pmfact.pdf. Fact sheet: EPA's revised particulate matter standards. *US EPA*, July 1997. March 2002.

ACRONYMS

AQ	Air Quality
BTS	Binational Toxics Strategy
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAMNet	Canadian Atmospheric Mercury Measurement Network
CAPMon	Canadian Air and Precipitation Monitoring Network
CARE	Centre for Atmospheric Research Experiments
CCME	Canadian Council of Ministers of the Environment
CEC	Commission for Environmental Cooperation
GL	Great Lakes
GLWQA	Great Lakes Water Quality Agreement
IADN	Integrated Atmospheric Deposition Network
IAQAB	International Air Quality Advisory Board
IJC	International Joint Commission
MACTs	Maximum Available Control Technology
MDN	Mercury Deposition Network
MOU	Memorandum of Understanding
mpg	miles per gallon
NAAQS	National Ambient Air Quality Standards
NAPs	National Air Pollution Surveillance Network
NARSTO	North American Research Strategy for Tropospheric Ozone
NO _x	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
OTAG	Ozone Transport Assessment Group
PM	Particulate Matter
PM ₁₀	Coarse particulate matter
PM _{2.5}	Fine particulate matter
POPs	Persistent organic pollutants
ppm	parts per million
PTSs	Persistent Toxic Substances
SIP(s)	State Implementation Plans(s)
SOLEC	State of the Lakes Ecosystem Conference
SUVs	Sport Utility Vehicle(s)
UNECE	United Nations Economic Commission for Europe