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Board of Health

Councillor
Peter Tabuns
Chair

Attention:
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September 5, 1995

NOTICE OF MEETING

BOARD OF HEALTH FOR THE CITY OF TORONTO HEALTH UNIT

The Board of Health will be considering the attached item(s) at its meeting on:

**Thursday, September 14, 1995
at 1:00 p.m., Council Chamber**

If you would like to comment on this item(s), please put your comments in writing and mail or fax them to:

Board of Health
Secretariat Division
Department of the City Clerk
Second Floor, City Hall
100 Queen Street West
Toronto M5H 2N2

FAX: 392-1879

Only Members of Council may address the Board of Health on this issue, but if you wish, you are welcome to attend the meeting.

for

Administrator
Board of Health for the
City of Toronto Health Unit
(g:\95prod\hlh\admin\comm.ntc)

有關上述衛生局事宜，請致電翻譯部，電話：392-7307。

Pour tout renseignements en français concernant la présente et relevant de la Santé, appelez le 416 392-7306.

Para informação, em Português, sobre a presente e tocante à Comissão de Saúde, contactar com a Secção de Traduções, através do telefone 416 392-7348.

Per informazioni circa la suddetta questione, relativa al Consiglio della Sanità, chiamare l'Ufficio Traduzioni al 416 392-7373.

SEP 1 2 21 PM '95

CITY OF TORONTO
PUBLIC HEALTH DEPARTMENT

August 23, 1995

CITY OF TORONTO
SECRETARY'S OFFICE
GENERAL SERVICES SECTION

To: Board of Health

Subject: Air Quality Advisory

Origin: Board of Health, June 14, 1995 (p:\1995\ug\hld\h1950096.hld)

Recommendations:

1. That the Board of Health request the federal Minister of Environment and the provincial Minister of Environment and Energy to issue Air Quality Advisories when average regional levels for ozone are forecast to reach to 50 ppb.
2. That the Board of Health urge the International Air Quality Advisory Board of the International Joint Commission to recommend immediate action from the governments of Canada and the United States regarding the harmonization of standards for transboundary pollutants such as ozone.

Background:

At its meeting of June 14, 1995, the Board of Health gave consideration to the communication (June 7, 1995) from Councillor Tabuns regarding Pollution Probe's call for smog warnings to be issued when ozone levels reach 40 parts per billion (ppb), down from the current 80 ppb. The Board of Health referred this matter to the Acting Medical Officer of Health for report back to the Board.

Comments:

In 1993 Environment Canada launched the Air Quality Advisory Program. This is a national program consisting of public announcements regarding the level of smog in various regions. In Ontario, Environment Canada and the Ontario Ministry of Environment and Energy (OMOEE) jointly issue air quality advisories when widespread elevated air pollution levels are forecast due to ground level ozone.

Smog, also referred to as photochemical smog, is a mixture of gases formed at ground level. Smog episodes occur more frequently in the summer due to the formation of ground level ozone, although winter smog may also occur due to sulphur dioxide and airborne particles. In the presence of sunlight, some groups of chemicals such as nitrogen oxides (NO_x) and volatile organic compounds (VOCs) will react to form ground level ozone, the major component of smog. NO_x and VOCs, the precursors of ozone, are emitted from both vehicles and point sources such as industrial facilities.

Transboundary transport of pollutants is also a significant contributor of ozone and its precursors, particularly when the air current is steady. The United States has less stringent ozone standards than Canada and monitoring and modelling exercises indicate that approximately 50 percent of the ozone and its precursors in Ontario originate in the United States (D. Yap, Ontario Ministry of Environment & Energy, personal communication).

The federal government, through federal/provincial consultations, has set the National Ambient Air Quality Objective (NAAQO) for ozone at 82 ppb (one hour maximum). The Ontario Ambient Air Quality Criterion, defined as desirable ambient criteria, is slightly lower at 80 ppb (one hour average). Neither the federal objective or the provincial criterion are enforceable limits. In comparison, the federal ozone standard in the United States is higher than both the Canadian and Ontario limits. However, this standard is enforceable under the Clean Air Act whereby exceedance of the standard of 120 ppb at any site within a state requires the state to implement programs aimed at reducing the ozone concentrations.

Currently, air quality advisories are issued when average regional levels for ozone are forecast to reach 80 ppb on a given day or over a number of days. In Southern Ontario, there was one advisory episode in 1993, two in 1994 and to date in 1995 there have been five (D. Yap, Ontario Ministry of Environment & Energy, personal communication).

The Air Quality Advisory builds upon the Air Quality Index system administered exclusively in Ontario by the OMOEE in Ontario. The Index is published daily in newspapers and broadcast on weather networks, a communication tool designed to keep the public informed of the air quality. Along with measuring ozone, the Air Quality Index measures and reports daily on five other common urban air pollutants: carbon monoxide, nitrogen dioxide, sulphur dioxide, suspended particles and total reduced sulphur. The index ranges from 0 to 100 and is separated into five categories; very good, good, moderate, poor and very poor. Although all six parameters are considered together in the determination of the index on a given day, when ozone concentrations reach 50 ppb the air quality is considered to be "moderate" and when concentrations reach 80 ppb it is considered to be "poor". This reflects a recent change that made the Air Quality Index more consistent with the Air Quality Advisory. Prior to July 1995, when the ozone concentration reached 50 ppb, the Air Quality Index categorized the air quality "good" and when the levels reached 80 ppb it was considered "moderate". Inconsistency with the Air Quality Advisory was apparent because an advisory would be issued at 80 ppb ozone but the Index would have categorized the air quality as "moderate".

On June 1, 1995 Pollution Probe called for a reduction in the Air Quality Advisory level to 40 ppb ozone from the current 80 ppb. As indicated in Councillor Tabuns request, Pollution Probe refers to a six year Health Canada study where the relationship between hospital admissions and episodes of elevated ozone and sulfates were examined (Burnett et al., 1994). This population-based study of 168 Ontario hospitals reported that approximately 5.8% of Ontario hospital admissions were due to respiratory diseases such as asthma, chronic obstructive pulmonary disease and infection from January 1983 to December 1988 (Burnett et al., 1994). The study concluded that the admissions to hospital may be attributable to elevated concentrations of sulfates and ground-level ozone, greater than 50 ppb, within one to three days prior to the date of admission. When ozone alone was examined the overall increase in hospital admission rates was 5.1% when concentrations exceeded 50 ppb.

Pollution Probe, in reviewing this recently published study of ozone related health effects, felt it prudent to recommend an advisory level below the 50 ppb ozone. Given the absence of any current evidence supporting the existence of a threshold, whereby exposure to concentrations less than a given level is not anticipated to have an adverse effect, Pollution Probe recommended that the Air Quality Advisory be issued when ozone levels are forecast to reach levels of 40 ppb or greater.

The study by Burnett and colleagues (1994), along with other health studies, was taken under consideration by an expert panel convened in 1993 by Health Canada. The expert panel, convened under the auspices of the Canadian Smog Advisory program, examined the evidence on the relationship between ozone and health effects and developed an exposure matrix for health effects (Pengelly et al., 1993; Stich et al., 1995).

Although the expert panel differed in their interpretation of the evidence on the occurrence of harmful effects in the general population at levels below 80 ppb, they concluded that there is evidence that certain groups are more susceptible to the acute effects of ground-level ozone, either on the basis of sensitivity or increased exposure during outdoor activity. The health matrix that was developed recognizes that effects can occur at levels between 50 and 80 ppb in both the general population and in sensitive groups. The expert panel did not recommend any change to the Air Quality Advisory because it was not identified as an objective for the panel. The expert panel also recognized that the scientific evidence published to date does not suggest the existence of a threshold (Burnett et al., 1994; Pengelly et al., 1993; Stieb et al., 1995). However, the very nature of an advisory, requires that a threshold or trigger level be identified.

There is some concern among regulatory agencies that lowering the Advisory level for ozone will increase the number of advisories in summer months so significantly that risk of causing unnecessary alarm or the converse, i.e., "advisory fatigue", must be acknowledged. For example, in July 1994 and 1995 approximately 40% of the month exceeded this level, 12 and 14 days respectively. This percentage will vary from year to year and among the Metropolitan Toronto area municipalities (D. Yap, Ontario Ministry of Environment & Energy, personal communication). Despite this possibility, however, it is my opinion that for those individuals with predisposed sensitivity or increased exposure due to considerable outdoor activity, awareness in the form of an advisory indicating that the air quality is "moderate" will allow avoidance of exposures that may effect their health.

As a result, it is recommended that the Board of Health request the federal Minister of Environment and the provincial Minister of Environment and Energy to issue Air Quality Advisories when average regional levels for ozone are forecast to reach to 50 ppb. Since the network of air monitors and the communication protocol are in place and maintained by the OMOEE for the Air Quality Index program, reducing an Advisory level to 50 ppb ozone would seem appropriate and immediately feasible.

Conclusion:

Toronto is situated in one of the Canadian regions that periodically exceeds the National Ambient Air Quality Criterion for ozone of 82 ppb. Attention to this air quality problem is warranted and interventions to reduce ground level ozone are needed.

Since the large number of cars on the road are a significant source of emissions that are precursors to the formation of smog it may be of limited value to revise the federal objective and the provincial desirable criteria for ozone in ambient air. Instead, efforts should be aimed at reducing emissions. The Department of Public Health supports various initiatives such as the Clean Air Partnership and the Clean Air Commute. Our study *Outdoor Air Quality In Toronto: Issues and Concerns* (1993) made a series of recommendations regarding vehicles that addressed issues such as public education, air quality monitoring, vehicle emission testing programs, alternative fuels, alternatives to vehicle use, and actions to be taken during a smog advisory.

The recent evidence relating significant hospital admissions in Ontario with air pollution episodes of ozone concentrations greater than 50 ppb provides the basis for revision of the Air Quality Advisory. It is understood that the range of effects and their degree will vary among individuals. Nonetheless, it is the public's right to know when air quality has been compromised to a level that may affect their health. This allows individuals who may be more sensitive to take appropriate measures such as avoiding activities which increase exposure. It is acknowledged that currently the OMOEE, under the Air Quality Index program, informs the general public daily as to the air quality in Ontario. However, public awareness and availability of this information tool is not as great as the Air Quality Advisory.

In its advisory capacity to the International Joint Commission, the Air Quality Advisory Board is examining the harmonization of ozone standards between Canada and the United States. The Advisory Board provides advice to the Commission on air pollution issues with transboundary implications. Given that much of the ozone and its precursors in Ontario originates from the United States and that the ozone standards of the latter are less stringent, regulatory harmonization is needed. Therefore, it is also recommended that the Board of Health urge the International Air Quality Advisory Board of the International Joint Commission to recommend immediate action from the governments of Canada and the United States to harmonize standards for transboundary pollutants such as ozone.

A handwritten signature in black ink, appearing to read 'D. McKeown', with a stylized, cursive script.

David McKeown, MDCM, MHSc, FRCPC, FACPM
Acting Medical Officer of Health

References

Burnett RT, Dales RE, Raizenne ME, Krewski D, Summer PW, Roberts GR, Raad-Young M, Dann T, and Brook J. (1994) Effects of low ambient levels of ozone and sulfates on the frequency of respiratory admissions to Ontario hospitals. *Environmental Research* 65: 172-194.

Pengelly LD, Taylor SM, and Stieb D. (1993) Canadian Smog Advisory Health Matrices for Ozone and Suspended Particles. Technical Working Paper, Final Report. Prepared for Health and Welfare Canada, Environmental Health Directorate, April 30, 1993.

Stieb DM, Pengelly LD, Arron N, Raizenne ME, and Taylor SM (1995) Health effects of air pollution in Canada: Expert panel findings for The Canadian Smog Advisory Program. *Canadian Respiratory Journal* 2(3) (in press: to be published in the fall of 1995).

Yap D, Ontario Ministry of Environment and Energy, personal communication.