CITY OF HAMILTON

PUBLIC HEATH SERVICES
Health Protection Division

TO: Mayor and Members Board of Health	**WARD(S) AFFECTED:** WARDS 1, 2, 3, 4 and 5
COMMITTEE DATE: December 3, 2012	
SUBJECT/REPORT NO: Neighbourhood Air Quality in Hamilton's Industrial Core (BOH12035) (Wards 1, 2, 3, 4 and 5) (Outstanding Business List Item "D")	
SUBMITTED BY: Elizabeth Richardson, MD, MHSc, FRCPC Medical Officer of Health Public Health Services Department	**PREPARED BY:** Matthew Lawson 905-546-2424, Ext. 5823 Sally Radisic 905-546-2424, Ext. 5549 Brian Montgomery 905-546-2424, Ext. 1275
SIGNATURE:	

RECOMMENDATION

(a) That Council request Clean Air Hamilton establish a working group to investigate and make recommendations to the City on actions that can be taken to reduce air pollution in Hamilton;

(b) That item "D" respecting neighbourhood air quality in Hamilton's industrial core be removed from the Public Health Services Outstanding Business List.

EXECUTIVE SUMMARY

In May 2012, Council passed a motion requesting that staff develop Terms of Reference and an action plan for an air pollution study to be conducted in Hamilton's industrial core, and that a funding request be made to the Ministry of the Environment for that purpose. Staff were also directed to establish an Air Quality Task Force to determine whether pollution in the industrial core is impacting the health of neighbourhood residents.

Based on consultation with a number of key stakeholders and a review of the published literature on the health impacts of industrial pollution, staff recommend that Council request Clean Air Hamilton (CAH) to establish a working group whose purpose is to investigate and make recommendations on actions that can be taken to reduce air pollution in Hamilton's industrial core. Further details regarding the rationale for the recommendations being brought forward for the Board's consideration are outlined in the following sections.

Alternatives for Consideration – See Page 5

FINANCIAL / STAFFING / LEGAL IMPLICATIONS (for Recommendation(s) only)

Financial: There are no financial implications in implementing the recommendations. If financial implications result from the advice of the working group, these will be brought forward to Council through the appropriate sub-committee as they arise.

Staffing: There are no staffing implications in implementing the recommendations. If staffing implications result from the advice of the working group, these will be brought forward to Council through the appropriate sub-committee as they arise.

Legal: There are no legal implications in implementing the recommendations. If legal implications result from the advice of the working group, these will be brought forward to Council through the appropriate sub-committee as they arise.

HISTORICAL BACKGROUND (Chronology of events)

May 2012: Lorna Moreau of the SOOT Residents Group presented information about the group's experiences residing in neighbourhoods in close proximity to Hamilton's industrial core as they relate to air quality. The SOOT group presented the following recommendations to Board members:

(a) That a study to determine whether pollution in neighbourhoods near Hamilton's industrial core is impacting human health; and

(b) That the existing 'Streets' By-law (No. 86-077) that addresses 'drag-out' of dust, dirt and other sources of particulate matter, be enforced in order to take steps at a municipal level to improve the quality of air in industrial neighbourhoods.

Following the presentation by the SOOT group, a discussion by the BOH members ensued and the following motion was passed recommending:

(a) That staff bring forward the Terms of Reference and Action Plan to the Board of Health, and a funding request be submitted to the Ministry of the Environment to assist with the costs of a pollution study; and

(b) That staff be directed to establish an Air Quality Task Force, which is to include key stakeholders to determine whether pollution in neighbourhoods near Hamilton's industrial core is impacting human health, and report back to the Board of Health.

July 2012: Professor Brian McCarry, PhD., Chair of Clean Air Hamilton (CAH) presented the CAH *Air Quality Progress Report, 2011* to the Board of Health. Professor McCarry notified Council that he is aware of the motions passed at the May 2012, Board of Health meeting and indicated that CAH would be pleased to participate if a task force on air quality is formed.

POLICY IMPLICATIONS

There are no policy implications in implementing the recommendations.

RELEVANT CONSULTATION

Clean Air Hamilton (CAH) – Members of CAH were consulted about the motion passed by Council regarding a proposed air pollution study and the call for a task force on air quality. Many of the members of CAH were surprised by the motion, as they felt that the membership of CAH is comprised of a diverse group of people that are well-informed on the issues affecting air quality in Hamilton. This includes representation from the community, academia, all three tiers of government, non-government organizations and local businesses and industries. The sense of surprise was attributed mainly to the fact that for over 10 years, CAH has presented an annual report to committees of City Council on the state of air quality in Hamilton and recommendations for its improvement, and that there was a perception that much of the information that a task force would seek to determine is redundant to much of the work that CAH performs. These indications aside, members of CAH were interested to learn more about the intent of a task force and were eager to participate if called upon.

Environment Hamilton – Executive Director, Lynda Lukasik, PhD., was consulted about her views on the motion passed by Council regarding a proposed air pollution study and the call for a task force on air quality. In general, Dr. Lukasik expressed her support for a study that would seek to provide additional information about health impacts of air quality on neighbourhoods in the industrial core. Additionally, she indicated that a task force might be able to identify issues and actions that could lead to

improvements in monitoring, reporting, and regulatory oversight and enforcement of air pollution legislation in Hamilton's industrial core.

Ministry of the Environment (MOE) – City staff consulted various MOE staff regarding the possibility of the MOE assisting with funding to conduct a pollution study in Hamilton's industrial core. The general consensus from MOE staff was that due to the budgetary climate within the MOE, it is very unlikely that any funding would be available to assist in carrying-out a pollution study.

The SOOT Residents Group – Public Health Services staff contacted members of the SOOT group to request a meeting to discuss their vision of what an Air Quality Task Force would seek to achieve, but all offers were declined. The SOOT Group did forward their proposed Terms of Reference for an Air Quality Task Force to members of Council via email, as well as various elected representatives of the provincial and federal government.

ANALYSIS / RATIONALE FOR RECOMMENDATION

(include Performance Measurement/Benchmarking Data, if applicable)

For over 25 years, numerous research studies have investigated both short-term (acute) and long-term (chronic) effects of air pollution exposure on health (See Appendix "A"). Conclusions from these studies highlight the fact that exposure to air pollution results in a variety of health outcomes, particularly in certain subgroups of the population such as the elderly, young children, and those with existing respiratory and/or cardiovascular conditions. Therefore, effects of air pollution exposure on health have been well established and documented – and it is now widely accepted that exposure to air pollution can have an impact on health. For that reason, the recommendations of many research studies focus on the tangible health benefits that might be achieved through the reduction of ambient air pollution levels. Furthermore, studies strongly support tighter standards for air pollution with an emphasis on particulate (PM) pollutants in Canada. It is with this evidence in mind that the recommendations in this report are being provided to the Board.

Additionally, Clean Air Hamilton has the ability to form working groups and create local partnerships that can examine specific air quality issues and recommend actions. Their membership consists of organizations that would be required to work together to develop and address issues effecting local air quality. CAH has already proved to be a valuable resource to Hamilton by undertaking research, developing partnerships, and providing annual reports to the City, which includes recommendations.

ALTERNATIVES FOR CONSIDERATION

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

Below is an alternative to the suggested recommendations which have been considered:

Develop Terms of Reference and an action plan for conducting a study to determine if pollution in neighbourhoods near Hamilton's industrial core is impacting human health.

Financial: Primary health research studies are expensive. Conservative cost estimates for a study begins at $400,000 and could easily reach upwards to $1,000,000 depending on the level of analysis that is desired.

Staffing: External consultants would need to be contracted to assist with a research study in both the planning and implementation phases.

Legal: No legal implications expected.

Policy: No policy implications.

Pros: Research findings may provide additional insights to the relationship between health outcomes and exposure to air pollution.

Cons:

- The cost (staff time and financial) associated with conducting a primary health impact study is considerable.
- The findings of a study may not provide information that has any value to the existing knowledge base, meaning, the results might simply confirm what is already known.
- The study itself would not reduce air pollution on its own.

CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)

Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability, 3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development, 6. Environmental Stewardship, 7. Healthy Community

Skilled, Innovative & Respectful Organization

- More innovation, greater teamwork, better client focus

Intergovernmental Relationships

- Influence federal and provincial policy development to benefit Hamilton
- Maintain effective relationships with other public agencies

Environmental Stewardship

- Reduced impact of City activities on the environment
- Reduce the impact of Hamilton's industrial, commercial Private and Public operations on the environment
- Aspiring to the highest environmental standards

Healthy Community

- Plan and manage the built environment
- An engaged Citizenry

APPENDICES / SCHEDULES

Appendix “A” - Health Study References for Effects of Air Pollution

Health Study References for Effects of Air Pollution

Short-term health effects include:

- higher rates of myocardial infarction
  - *Pope CA 3rd, Muhlestein JB, May HT, Renlund DG, Anderson JL, Horne BD. schemic heart disease events triggered by short-term exposure to fine particulate air pollution. Circulation. 2006 Dec 5;114(23):2443-8. Epub 2006 Nov 13.*
  - *Simkhovich BZ, Kleinman MT, Kloner RA. Air pollution and cardiovascular injury epidemiology, toxicology, and mechanisms. J Am Coll Cardiol. 2008 Aug 26;52(9):719-26. Review.*

- exacerbation of heart failures
  - *Goldberg MS, Giannetti N, Burnett RT, Mayo NE, Valois MF, Brophy JM. A panel study in congestive heart failure to estimate the short-term effects from personal factors and environmental conditions on oxygen saturation and pulse rate. Occup Environ Med. 2008 Oct;65(10):659-66.*
  - *Goldberg MS, Burnett RT, Valois MF, Flegel K, Bailar JC 3rd, Brook J, Vincent R, Radon K. Associations between ambient air pollution and daily mortality among persons with congestive heart failure. Environ Res. 2003 Jan;91(1):8-20.*

- higher incidence rates of cardiac arrhythmia
  - *Peters A, Liu E, Verrier RL, Schwartz J, Gold DR, Mittleman M, Baliff J, Oh JA, Allen G, Monahan K, Dockery DW. Air pollution and incidence of cardiac arrhythmia. Epidemiology. 2000 Jan;11(1):11-7.*
  - *Routledge HC, Ayres JG, Townend JN. Why cardiologists should be interested in air pollution. Heart. 2003 Dec;89(12):1383-8. Review.*
  - *Simkhovich BZ, Kleinman MT, Kloner RA. Air pollution and cardiovascular injury epidemiology, toxicology, and mechanisms. J Am Coll Cardiol. 2008 Aug 26;52(9):719-26. Review.*

- exacerbation of obstructive respiratory illness like asthma and chronic obstructive pulmonary disease (COPD)
  - *Koenig JQ. Air pollution and asthma. J Allergy Clin Immunol. 1999 Oct;104(4 Pt 1):717-22. Review.*
  - *Sunyer J. Urban air pollution and chronic obstructive pulmonary disease: a review. Eur Respir J. 2001 May;17(5):1024-33.*

- increase respiratory inflammation and irritation
  - *McCreanor J, Cullinan P, Nieuwenhuijsen MJ, Stewart-Evans J, Malliarou E, Jarup L, Harrington R, Svartengren M, Han IK, Ohman-Strickland P, Chung KF, Zhang J. Respiratory effects of exposure to diesel traffic in persons with asthma. N Engl J Med. 2007 Dec 6;357(23):2348-58.*

- *Ghio AJ, Hall A, Bassett MA, Cascio WE, Devlin RB. Exposure to concentrated ambient air particles alters hematologic indices in humans. Inhal Toxicol. 2003 Dec;15(14):1465-78.*

- diminished lung function
  - *Brunekreef B, Dockery DW, Krzyzanowski M. Epidemiologic studies on short-term effects of low levels of major ambient air pollution components. Environ Health Perspect. 1995 Mar;103 Suppl 2:3-13. Review.*

Long-term health effects include:

- higher relative risk of mortality due to particulate exposure
  - *Pope CA 3rd, Burnett RT, Thurston GD, Thun MJ, Calle EE, Krewski D, Godleski JJ. Cardiovascular mortality and long-term exposure to particulate air pollution: epidemiological evidence of general pathophysiological pathways of disease. Circulation. 2004 Jan 6;109(1):71-7. Epub 2003 Dec 15.*
  - *Pope CA 3rd, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. JAMA. 2002 Mar 6;287(9):1132-41.*

- enhanced development of atherosclerosis as a result of air pollution
  - *Künzli N, Jerrett M, Mack WJ, Beckerman B, LaBree L, Gilliland F, Thomas D, Peters J, Hodis HN. Ambient air pollution and atherosclerosis in Los Angeles. Environ Health Perspect. 2005 Feb;113(2):201-6.*
  - *Hoffmann B, Moebus S, Möhlenkamp S, Stang A, Lehmann N, Dragano N, Schmermund A, Memmesheimer M, Mann K, Erbel R, Jöckel KH, Heinz Nixdorf. Recall Study Investigative Group. Residential exposure to traffic is associated with coronary atherosclerosis. Circulation. 2007 Jul 31;116(5):489-96. Epub 2007 Jul 16.*

- higher levels of systemic inflammatory markers associated with air pollution exposure
  - *Pope CA 3rd, Dockery DW. Health effects of fine particulate air pollution: lines that connect. J Air Waste Manag Assoc. 2006 Jun;56(6):709-42. Review.*
  - *Seaton A, Soutar A, Crawford V, Elton R, McNerlan S, Cherrie J, Watt M, Agius R, Stout R. Particulate air pollution and the blood. Thorax. 1999 Nov;54(11):1027-32.*
  - *Ghio AJ, Hall A, Bassett MA, Cascio WE, Devlin RB. Exposure to concentrated ambient air particles alters hematologic indices in humans. Inhal Toxicol. 2003 Dec;15(14):1465-78.*
  - weakened lung development in children has been documented as a health effect related to air pollution
  - *Gauderman WJ, Vora H, McConnell R, Berhane K, Gilliland F, Thomas D, Lurmann F, Avol E, Kunzli N, Jerrett M, Peters J. Effect of exposure to traffic on lung development from 10 to 18*

years of age: a cohort study. Lancet. 2007 Feb 17;369(9561):571-7.

- *Miller KA, Siscovick DS, Sheppard L, Shepherd K, Sullivan JH, Anderson GL, Kaufman JD. Long-term exposure to air pollution and incidence of cardiovascular events in women. Engl J Med. 2007 Feb 1;356(5):447-58*.

- higher rates of asthma and asthma exacerbations have been linked to air pollution exposure
  - *Pope CA 3rd. Epidemiology of fine particulate air pollution and human health: biologic mechanisms and who's at risk? Environ Health Perspect. 2000 Aug;108 Suppl 4:713-23. Review.*
  - *Trasande L, Thurston GD. The role of air pollution in asthma and other pediatric morbidities. J Allergy Clin Immunol. 2005 Apr;115(4):689-99. Review.*
  - *Clark NA, Demers PA, Karr CJ, Koehoorn M, Lencar C, Tamburic L, Brauer M. Effect of Early Life Exposure to Air Pollution on Development of Childhood Asthma. Environmental Health Perspectives. 2010 Feb; 118(2): 284-290.*