Air Emissions from the Chevron North Burnaby Refinery

Appendix A

Terms of Reference

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Air Emissions from the Chevron Burnaby Refinery  
Human Health Impact Assessment  
Terms of Reference

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Introduction

UBC researchers will undertake a human health risk assessment focusing on the potential impact of current air emissions from the Chevron Burnaby refinery on the health of north Burnaby residents.

These terms of reference have been developed by the UBC research team and approved by a project advisory committee consisting of representatives from MELP, Environment Canada, GVRD, Simon Fraser Health Region, Chevron Canada, the City of Burnaby, Burnaby School Board, and community members. The project advisory committee's role is to provide input and advice to the UBC research team, to approve the terms of reference for the project, to provide one vehicle for obtaining stakeholder input into the project as it develops, and to receive the final report.

Project Goal

The overall goal of the project is to perform an assessment of the potential human health impact of current air emissions (scheduled and unscheduled) from the Chevron Burnaby refinery, tank farm, and associated facilities, based on health and exposure information available in the scientific literature and existing exposure data in and around the Chevron Burnaby facility and the surrounding community.

If the initial assessment indicates that further data need to be collected in order to characterize some of the risks to human health, a proposal outlining the specifics of such work will be prepared for review by the project advisory committee.
**General Approach**

Conventional risk assessment methods will be used, as recently elaborated in the Risk Estimation component of the consensus guideline, CSA - Q850 Framework for Risk Management(1). These methods are based on the 1983 US National Research Council report "Risk Assessment in the Federal Government: Managing the Process"(2). This approach is also essentially the same as that recommended by Health Canada in their 1999 draft document, Canadian Handbook on Health Impact Assessment.(3)

Exposure assessment will be based primarily on existing site-specific monitoring data, augmented by information available in the scientific literature on similar operations.

Health information will be obtained through a comprehensive literature review (using MEDLINE, TOXLINE, NIOSHTIC, Environmental Sciences and Pollution Management, and publicly accessible government databases such as the US DOE Risk Assessment Information Systems, and EPA Integrated Risk Information Systems), meetings with stakeholders, public agencies, and others who may have data or site-specific information relevant to the study.

Information sources will be clearly identified in all reports.

It is expected that the final comments on potential human health impact will take one or more of the following forms:

- estimates of the expected extra number of affected persons (for a given disease or symptom), compared to what would be expected for a similar community without a refinery
- the probability that a local resident would develop a specific disease or symptom over and above that expected for a similar community without a refinery
- estimates of the size of the "margin of safety" between current exposures and those known to be linked to disease or symptoms.

Sources of uncertainty and the possible range of the risk estimates will also be identified. Limited probabilistic modeling of exposures will be carried out to create 'best estimates' of exposure and health risks as well as the range of risk estimates (ie. 'worst case' and 'best case' estimates). Findings will be summarized as much as possible in non-technical language, and general recommendations made where appropriate.

**Process**

In order to carry out the risk assessment, the UBC research team proposes to undertake the following specific work:

1. Review data from all ambient and personal air monitoring conducted in the community surrounding the Chevron North Burnaby plant and inside the plant gates in the past 5 years.
The members of the project advisory committee agree that all available original monitoring data will be made available to UBC for this review (including that from the GVRD, Chevron, MELT, Environment Canada).

2. Review relevant ambient and personal air monitoring data from the published scientific literature based on studies of refineries or other similar facilities and make an assessment of the relevance of these data for the current project.

   To facilitate the evaluation of data obtained in this step, UBC researchers will review detailed information about specific products (received, processed, shipped), processes, emissions, and site-specific activities of the Chevron Burnaby operation. The project advisory committee members agree to make this information available to the research team.

3. Review existing toxicology and epidemiology information from the published scientific literature with specific reference to SO\textsubscript{x}, volatile organic compounds, total reduced sulfur, nitrogen oxides, particulate matter, ozone, and other substances (esp. additives and by-products) that may become apparent during the review of products and site-specific activities.

4. Combine and interpret information gathered from the review of health literature review and exposure data to do the following:
   a) comment on the anticipated added human health impact of exposures to the selected air contaminants at the levels currently present, and / or
   b) identify what additional information needs to be collected locally in order to determine whether or not there are likely health impacts.

Scope

This project focuses on current air emissions of relevance to residents located in close proximity to the Chevron refinery and storage facility. Priority will be given to those substances and processes associated with the highest levels of community and regional health department concerns. Scheduled and unscheduled emissions refer to planned and fugitive emissions that occur in the course of day to day operations and includes accidental emissions that could reasonably be foreseen based on past occurrences.

The project does not address potential soil or water contamination nor significant accidental air emissions from catastrophic events. Further, it does not cover the social, economic, or general health benefits associated with the Chevron Burnaby refinery operations.

Reporting

At the conclusion of the project, a draft report will be issued by UBC to the advisory committee and input sought. UBC will consider the input from the project advisory committee; however, the contents of the final report will be controlled by the UBC researchers. Peer review will be obtained by UBC on the report prior to its release as a public document. The final report will
remain the property of the UBC investigators. The final report will be released by UBC to all stakeholder groups represented on the advisory committee.

Research Team Members

Sarah Henderson, Research Engineer
Sonia Na, Research Scientist
Anne-Marie Nicol, Risk Communication Scientist
Colin MacKay, MD, Community Medicine Resident

References


Advisory Committee Members

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