



**CN Milton Logistics Hub Country
Foods Follow-up Program**

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Abbreviations

B(a)P TPE	benzo(a)pyrene total potency equivalents
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
CN	Canadian National Railway Company
IAAC	Impact Assessment Agency of Canada
PEF	Potency equivalence factor
PAH	Polycyclic Aromatic Hydrocarbon
PDA	Project Development Area

CN MILTON LOGISTICS HUB COUNTRY FOODS FOLLOW-UP PROGRAM

Introduction
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1.0 INTRODUCTION

This document outlines the follow-up program for human health as it pertains to country foods in relation to construction and operation of the Milton Logistics Hub.

The country foods follow up program presented below, and the associated monitoring details have been developed to comply with the conditions of approval in the Minister of the Environment's Decision Statement issued January 21, 2021. This program has been developed to comply with Condition 9.1 of the Decision Statement and has been developed in consultation with Health Canada. Draft versions of this FUP were provided to Health Canada on August 17, 2020. Comments were received from the Health Canada and have been considered in finalizing this document. Any revisions and manner by which comments were addressed, including corresponding rationale, were communicated to those who responded to CN's request for input. No updates to this follow-up program are proposed through implementation of this follow-up program unless adaptive management is required.

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2.0 PROGRAM DESIGN CONSIDERATIONS

A country food follow-up program will be implemented during construction and operation to verify the accuracy of the environmental assessment and determine the effectiveness of proposed mitigation measures. The program has been developed in accordance with the information outlined in Condition 2.6 of the Decision Statement.

The program will consist of soil sampling and analysis of polycyclic aromatic hydrocarbons (PAHs) from plots located upwind and downwind of the PDA during the pre-construction, construction, and operational phases of the Project.

Through the established community liaison communication process, concerns raised by the local community as related to county foods will be reviewed and addressed through the adaptive management process outlined in Section 3.4 below.

3.0 HUMAN HEALTH AND COUNTRY FOODS

In their preamble to CEAA Recommendation 11.1 (Follow-up program for country foods), the Review Panel wrote that the primary pathway for contamination of country foods and home gardens in the area of the project would be from air emissions and the associated deposition of contaminants like benzo(a)pyrene, or B(a)P. Health Canada (2018) defines country foods as: aquatic and terrestrial fauna fished, trapped, hunted, and/or harvested (e.g., game animals and birds, fish, and seafood) for domestic consumption; produce harvested from naturally occurring sources (e.g., berries, seeds, leaves, roots, and lichen); plant tissues (e.g., roots, bark, leaves, and seeds) ingested for medicinal or other uses (e.g., teas); produce (e.g., fruits, vegetables, and fungi) grown in gardens, and/or home orchards; or aquatic and terrestrial fauna (and its by-products) produced for domestic consumption but not for market (e.g., ducks, chickens or other fowls, eggs, and dairy products).

Hunting, trapping, and harvesting of wildlife is not allowed within Milton city limits (i.e., discharge of firearms is prohibited within city limits), and while CN is not aware of local berry harvests, it is likely that people in Milton may have backyard gardens and CN is aware of community garden plots throughout Milton. The types of plants grown in gardens is a personal preference and likely varies from garden to garden (e.g., carrots, beans, peas, tomatoes). Soil conditions (e.g., moisture, organic content) also vary from garden to garden. This, combined with plant type, all relate to the potential for uptake of B(a)P into plants (e.g., Hunt et al., 2019; Fismes et al., 2002). As a result, a follow up program that measures B(a)P, and other PAHs, in plants would likely yield high levels of variability and uncertainty.

Given that plants can uptake B(a)P and other PAHs from the soil in which they grow, a Follow-up Program that focuses on measuring PAHs in soil at two locations is proposed.

3.1 CRITERIA

In the environmental assessment of the project, 14 PAHs were associated with diesel engines, and of these, eight (as identified in response to IR3.11) are defined by Health Canada as carcinogenic, see **Table 1**. Health Canada (2012) directs that “Exposures to mixtures of carcinogenic PAHs should be assessed according to the potency equivalence factor (PEF) scheme...in which carcinogenic PAHs are adjusted to their carcinogenic potency relative to benzo[a]pyrene, and the potency equivalents are then summed”. The Canadian Council of Ministers of the Environment (CCME) has a soil quality guideline of 5.3 mg/kg for carcinogenic PAHs, specifically in terms of B(a)P total potency equivalents, or B(a)P TPE, that takes into account exposure from the eight aforementioned PAHs. As such, these eight PAHs will be analyzed for in soil samples. The CCME does not provide soil quality guideline for non-carcinogenic PAHs in soil.

Table 1: PAHs to be analyzed in soil samples

fluoranthene	benz(a)anthracene	benzo(a)pyrene	benzo(b)fluoranthene
benzo(g,h,i)perylene	benzo(k)fluoranthene	chrysene	phenanthrene

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3.2 LOCATION

Soil samples will be collected from within the 50m by 50m designated plots of the upwind and downwind air monitoring station locations identified in the Air Quality Monitoring and Adaptive Management Plan. Deposition of PAHs associated with the Project at these two locations are expected to be higher than at locations further away from the project (i.e., where there are community gardens and backyard gardens). As such, monitoring of PAHs at these locations will provide a conservative estimate of what concentrations of PAHs in soil could be in other areas where country foods are grown.

3.3 METHODS

To coincide with the Air Quality and Adaptive Management Plan sampling program, soil samples will be collected during the pre-construction, construction, and operational phases of the Project. Soil samples will be collected and analyzed as described below, with the number of sampling events expected to vary by project phase as follows.

- Pre-construction – one sampling event to establish baseline conditions at the sampling locations near the middle or end of the growing season for primary country foods in the area (e.g., tomatoes, carrots, berries).
- Construction – three sampling events; one per each phase of construction at the sampling locations near the middle or end of the growing season for primary country foods in the area.
- Operations – annual sampling event for first five years of operation (5 total sampling events) at the sampling locations near the middle or end of the growing season for the primary country foods in the area.
- Samples are to be collected in the top 30 cm of soil, since this is the growing and rooting zone of most garden produce.
- Soil samples will be sent to an analytical laboratory for analysis of the individual carcinogenic PAHs identified in **Table 1** above. Concentrations of the PAHs will be multiplied by their respective PEF and a B(a)P TPE calculated for each soil sample. This B(a)P TPE will be compared to the CCME soil quality guideline of 5.3 mg/kg.

Soil collection will follow Standard Operation Procedures for surface soil sampling as well as CCME soil sampling operating procedures (CCME 2016).

3.4 ADAPTIVE MANAGEMENT

In the event that the B(a)P TPE in soil is greater than the CCME threshold, then adaptive management measures would be informed through consultation with Health Canada. Information obtained through the Community Working Group about country foods will also be used to inform the follow up study.

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If warranted, the first step in adaptive management measures planning would be a discussion of results with Health Canada, completion of additional soil sampling, or a qualitative or quantitative human health risk assessment. It needs to be acknowledged that the baseline + project (construction and operation time periods) soils will also have non-project contributions (e.g., from cars and trucks and local changes in ambient conditions), so apportioning a Project-only contribution to B(a)P TPE in soil is not feasible.

3.5 REPORTING

The results of the Country Food Follow-up Program will be reviewed, analyzed, and presented in a report to document:

- (a) the results of the monitoring program;
- (b) conformity with CCME Soil Quality Guideline for PAH for the Protection of Environmental and Human Health;
- (c) the effectiveness of the mitigation measures (related to air emissions); and
- (d) any adaptive management measures (i.e., mitigation measures), if required.

The frequency and duration of reporting will be completed annually and will be prepared for pre-construction, the three phases of construction and annually for the first five years of operation, with the results provided to Health Canada and IAAC or as directed by the Minister's conditions.

4.0 REFERENCES

CCME (Canadian Council of Ministers of the Environment). 2010. Canadian Soil Quality Guidelines Carcinogenic and Other Polycyclic Aromatic Hydrocarbons (PAHs) (Environmental and Human Health Effects). Scientific Criteria Document (revised). PN 1445, ISBN 978-1-896997-94-0 PDF

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