TOXICS SUBSTANCE REDUCTION PLAN SUMMARY

Holcim (Canada) Inc. – Mississauga Cement Plant

2391 Lakeshore Road West
Mississauga, ON
L5J 1K1

www.holcim.ca

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1. Introduction

Commisioned in 1956, the Holcim Canada Mississauga Plant is one of the largest and most environmentally responsible suppliers of cement in Canada. The Plant employs approximately 185 people and has an annual capacity of 1.5 million tonnes of cement, plus 0.5 million tons of GranCem. Over the course of the last 56 years, the Mississauga Plant has witnessed ongoing technological advancements designed to meet the increasing needs of the marketplace, to improve environmental performance, to enhance employee safety and to mitigate impacts on the local community.

Holcim (Canada) Inc. is one of the country's largest vertically integrated building materials and construction companies. With 3,000 employees, Holcim (Canada) Inc. manufactures cement, aggregates and ready-mix concrete and provides construction services to many of Canada's largest infrastructure projects.

Holcim (Canada) Inc. is a member of Holcim Group, a Swiss-based multinational with operations in more than 70 countries worldwide. A leading global brand, Holcim is recognized for its long-term financial performance, its environmental leadership, corporate social responsibility and sustainable construction.

2. Reporting Criteria

Section 3(1) of the Toxics Reduction Act (TRA) specifies the criteria requiring the preparation of a toxic substance plan.
These criteria are as follows:

> *3. (1) The owner and the operator of a facility shall ensure that a toxic substance reduction plan is prepared for a toxic substance in accordance with this Act and the regulations if all of the following criteria are met:*
> *1. The facility belongs to a class of facilities prescribed by the regulations.*
> *2. The number of persons employed at the facility exceeds the number of persons prescribed by the regulations.*
> *3. The toxic substance is used or created at the facility and the amounts of the substance that are used or created meet the criteria prescribed by the regulations.*
> *4. Such other criteria as are prescribed by the regulations. 2009, c. 19, s. 3 (1).*

Section 4(1) of O. Reg. 455/09 specifies the types of facilities subject to toxic substance reduction planning and includes facilities that begin in North American Industry Classification System (NAICS) code “31”, “32” or “33” and “212”. Holcim (Canada) Inc. – Mississauga operates under the category of “cement manufacturing”, and therefore has a NAICS code beginning with “32”.

The Mississauga Cement Plant was required to produce a Toxics Reduction Plan for the following substances:

- Acenaphthylene
- Benzene
- Chromium
- Dioxins and Furans
- Fluorene
- Hexachlorobenzine
- Hydrochloric Acid
- Mercury
- Phenanthrene
- Selenium
- Toluene
- Total Volatile Organic Compounds (VOCs)
- Xylene

3. General Facility Information

3.1 Company Information

Parent Company Name	Holcim (Canada) Inc.
Parent Company Address	2300 Steeles Ave. West, 4th Floor Concord, Ontario L4K 5X6
Facility Name	Holcim (Canada) Inc. - Mississauga
Facility Address	2391 Lakeshore Road West Mississauga, Ontario L5J 1K1
Universal Transverse Mercator (UTM) in North American Datum (NAD83)	Zone: 17 Easting: 610948.37 Northing: 4816945.05
National Pollutant Release Inventory Identification Number	2182
Ontario Regulation 127/01 Identification Number	5112
Two Digit North American Industry Classification System (NAICS) Code	32 – Manufacturing
Four Digit North American Industry Classification System (NAICS) Code	3273 - Cement and Concrete Product Manufacturing
Six Digit North American Industry Classification System (NAICS) Code	327310 - Cement Manufacturing
Number of Full-time Employee Equivalents at the Facility	185

3.2 Contact Information

Facility Public Contact	Greg Zilberbrant Environment Manager 2391 Lakeshore Road West Mississauga, ON L5J 1K1 905 822-1653 ext. 4371 Greg.Zilberbrant@holcim.com
Technical Contact	Greg Zilberbrant
Coordinator	Greg Zilberbrant
Highest Ranking Employee	Marius Seglias Plant Manager 2391 Lakeshore Road West Mississauga, ON L5J 1K1 905 822-1653 ext. 4770
License Number of Planner	TSRP0045

4. Toxics Substances

For the purpose of this plan, toxic substances were organized into the following categories:

- Metals (Chromium, Mercury & Selenium)
- PAHs (Acenaphthylene, Fluorene, Phenanthrene)
- VOCs (Benzene, Toluene, Xylene)
- Hexachlorobenzene
- Hydrochloric Acid
- Dioxins and Furans

The purpose of these categories is to avoid duplication of information among toxic substances that share similar characteristics and qualities. This summary is an accurate reflection of the Mississauga Cement Plant Toxics Reduction Plan.

Metals - Chromium, Mercury, Selenium	
Statement of Intent	The Mississauga Cement Plant intends to reduce its use of toxic metals in its processes, specifically; Chromium, Mercury and Selenium.
Description of Substances	Toxic metals enter the cement manufacturing process through two primary avenues: Fuels and Raw Materials. In fuels, the vast majority of metals originate from coal. Coal is a major fuel source in the cement manufacturing process, and provides the energy needed to maintain operation of the kiln. In raw materials, metals predominantly originate from limestone and slag. Limestone is an essential raw material needed to produce lime though the process of calcination. Slag is essential to the production of GranCem (a cement substitute). Metals are not created at the facility.

PAHs - Acenaphthylene, Fluorene, Phenanthrene	
Statement of Intent	The Mississauga Cement Plant does not intend to reduce its use or creation of PAHs in its processes. PAHs are created as a result of the high temperatures of the kiln and the organic carbon found in raw meal, an essential component of the cement manufacturing process. While the Mississauga Cement Plant does not intend to reduce its use of PAHs, it will continue to examine the conditions under which PAHs are created in its processes and explore reduction opportunities.

Description of Substances	The tracking of PAHs through the cement manufacturing process is a relatively complex task as there are instances of destruction and creation at various stages, depending on factors such as temperature and organic carbon found in raw material.

VOCs – Benzene, Toluene, Xylene	
Statement of Intent	The Mississauga Cement Plant does not intend to reduce its use or creation of VOCs in its processes. VOCs are created as a result of the high temperatures of the kiln and the organic carbon found in raw meal, an essential component of the cement manufacturing process. While the Mississauga Cement Plant does not intend to reduce its use of VOCs, it will continue to examine the conditions under which VOCs are created in its processes and explore reduction opportunities.
Description of Substances	The tracking of VOCs through the cement manufacturing process is a relatively complex task as there are instances of destruction and creation at various stages, depending on factors such as temperature and organic carbon found in raw meal.

Hexachlorobenzene	
Statement of Intent	The Mississauga Cement Plant does not intend to reduce its creation of Hexachlorobenzene. However, it will continue to examine the conditions under which Hexachlorobenzene is created in its processes and explore reduction opportunities.
Description of Substances	The tracking of Hexachlorobenze through the cement manufacturing process is a relatively complex task depending on factors such as temperature and available carbon and chlorine in the kiln. Hexachlorobenzene is formed in the kiln process through the reaction of carbon with chlorine originating from the fuel and raw material inputs. Hexachlorobenzene is not used at the facility.

Hydrochloric Acid	
Statement of Intent	The Mississauga Cement Plant does not intend to reduce its creation of Hydrochloric Acid. However, it will continue to examine the conditions under which Hydrochloric acid is created in its processes and explore reduction opportunities.

Description of Substances	The tracking of Hydrochloric Acid through the cement manufacturing process is a relatively complex depending on factors such as temperature and available chlorine in the kiln. Hydrochloric Acid is formed in the kiln process through the reaction of chlorine and hydrogen originating from the fuel and raw material inputs. Hydrochloric acid is not used at the facility.

Dioxins and Furans	
Statement of Intent	The Mississauga Cement Plant does not intend to reduce its creation of Dioxins and Furans. Levels of Dioxins and Furans are already well below the Level of Quantification (LoQ).
Description of Substances	Dioxins and Furans are not used at the facility. Dioxins and Furans are created at well below the Level of Quantification (LoQ).

5. Options to be implemented

5.1 Reduction of Coal through increased usage of Petcoke

Petroleum coke (Petcoke) is a carbonaceous solid that is a byproduct of petroleum refining. Since much of the processing occurs before it arrives at the Mississauga Cement Plant, petcoke contains relatively few toxic substances. Therefore, substituting fuel such as coal with petcoke could potentially significantly reduce the amount of toxics used on site. This option involves the increased usage of petcoke, while simultaneously decreasing the amount of coal combusted. The Mississauga Cement Plant trialed this option in 2012, with the intent to fully implement in 2013.

While there are anticipated variations in consumption of other fuels, in general, petcoke can be considered a direct substitute for coal. Therefore, for the purpose of simplicity, only petcoke and coal are considered and compared in this analysis.

Based on 2011 testing, Table 1 shows the estimated toxic metal reductions (use, creation, contained in product and release) in 2013, using 2011 coal and petcoke consumption as a baseline.

Table 1: Estimated Metals Reductions (Used, Created, In product, Release)

Toxic Substance	2013	% Reduction
Chromium (tonnes)		
Used	3.88	6.7%
Created	N/A	N/A
In product	3.57	6.7%
Release	0.001	6.7%
Mercury (kg)		
Used	1.15	4.3%
Created	N/A	N/A
In product	0.064	4.3%
Release	0.801	4.3%
Selenium (tonnes)		
Used	0.122	5.0%
Created	N/A	N/A
In product	0.121	5.0%
Release	0.002	5.0%

5.2 Reduction of Bunker Oil through increased usage of Natural Gas

The use of Natural Gas as fuel in the cement manufacturing process presents an opportunity to reduce toxics substances. Natural Gas has been deemed a feasible kiln startup fuel with the potential to replace Bunker Oil, a fuel that is a source of metals. This option involves the introduction of Natural Gas as kiln startup fuel in 2013, alongside a reduction in the use of bunker oil.

While there are anticipated variations in consumption of other fuels, in general, Natural Gas can be considered a direct substitute for Bunker Oil. Therefore, for the purpose of simplicity, only Natural Gas and Bunker Oil are considered and compared in this analysis. Natural Gas is assumed to contain virtually no toxic substances.

Since the temperature of the main burner approaches 1400°C, it can safely be assumed that PAHs and VOCs are immediately destroyed upon combustion. Therefore, the only measureable impact from a toxics reduction perspective pertains to metals.

Based on 2011 testing, Table 2 shows the estimated toxic metal reductions (use, creation, contained in product and release) in 2013, using 2011 Bunker Oil and Natural Gas consumption as a baseline.

Table 2: Estimated Metals Reductions (Used, Created, In product, Release)

	2013	% Reduction
Chromium (tonnes)		
Used	0.0276	0.048%
Created	N/A	N/A
In product	0.0256	0.048%
Release	$5.51x10^{-06}$	0.048%
Selenium (tonnes)		
Used	0.0052	0.212%
Created	N/A	N/A
In product	0.0051	0.212%
Release	$8.25x10^{-05}$	0.003%

5.3 Reduction of coal through increased usage of Engineered Fuels (EFs) with lower metal content

The use of Engineered Fuels (EFs) presents an opportunity to reduce toxics substances in the cement manufacturing process. In particular, the use of Engineered Fuels (EF) with low metal content can be an effective way of ensuring that metals are not introduced in to the manufacturing process. This option involves the introduction of engineered fuels to the fuel mix, while simultaneously reducing coal consumption by equivalent amounts. Levels of PAHs, VOCs, Hexachlorobenzene and Hydrochloric Acid are expected to be unaffected by the phasing in of EFs. While there are anticipated variations in consumption of other fuels, in general, EFs can be considered a direct substitute for coal.

Based on 2011 testing, Table 3 shows the estimated toxic metal reductions (use, creation, contained in product and release) in 2015, using 2011 coal consumption as a baseline.

Table 3: Estimated Metals Reductions (Used, Created, In product, Release)

	~ 2015	% Reduction
Chromium (tonnes)		
Used	7.37	12.8%
Created	N/A	N/A
In product	6.78	12.8%
Release	0.001	12.8%