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HEIDELBERGCEMENT Group

Alternative Low Carbon Fuel Use at the Lehigh Picton Cement Plant

August 25, 2022

Presentation Etiquette

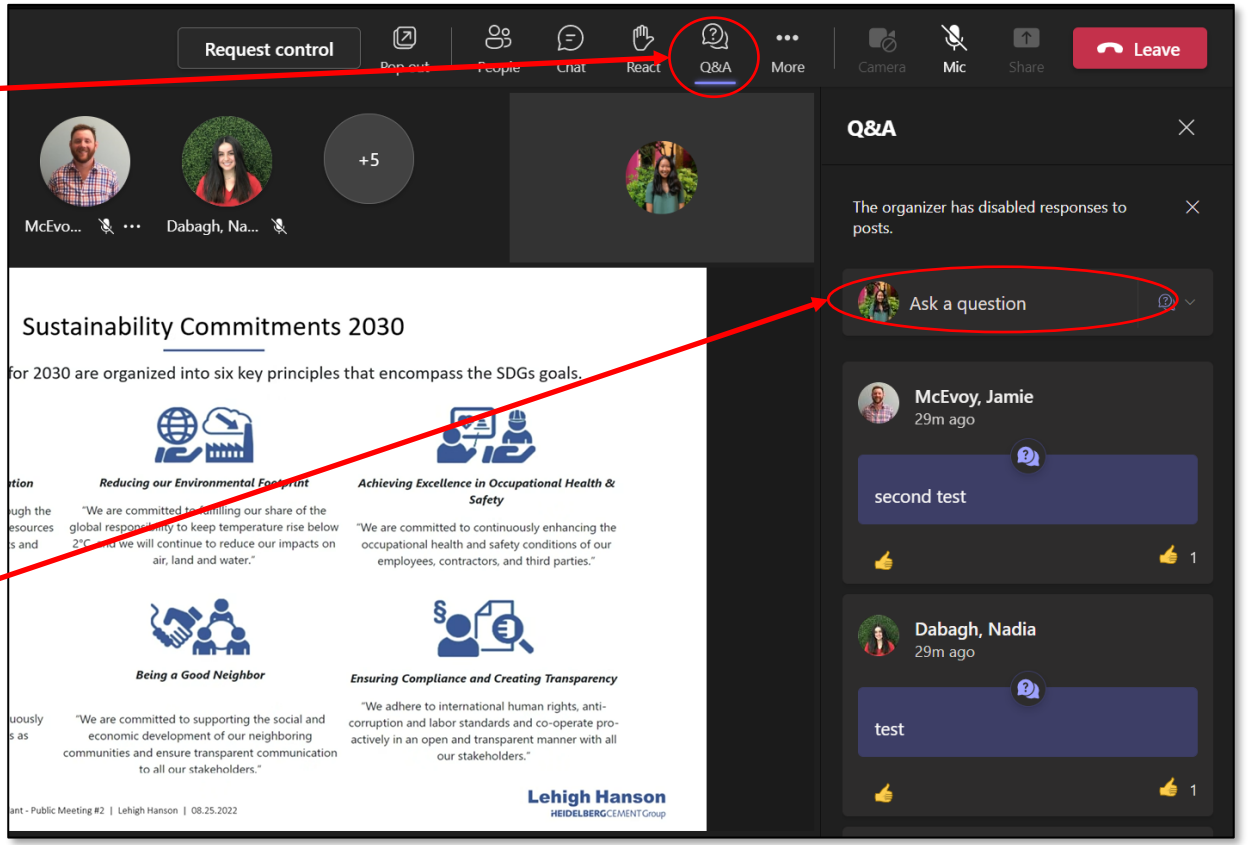
- **Be Patient** – Virtual meetings do not always run as smoothly as planned. We apologize if there are any technical difficulties.
- **Be Respectful** – Listen to and respect other points of view. Lehigh is an inclusive organization. Discriminatory, prejudicial, or hateful comments will not be tolerated.
- **Stay on Topic** – Please keep all questions and comments focused on this Project.
- **We want to hear from you** – please do not be shy!

How to use Microsoft Teams Question & Answer (Q&A) Function

Click the “**Q&A**” function here.

Click the “**Ask a question**” and start typing your questions / comments.

Click “**Post**” to submit.



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Overview of Public Meeting #2

The Lehigh Picton Cement Plant is undertaking efforts to use Alternative Low Carbon Fuels (ALCFs) to supplement fossil fuels for the production of cement. This meeting is an important part of the ALCF permitting process in accordance with O. Reg. 79/15.

1. Background

- Introduction & Project Team
- O. Reg. 79/15 Permitting Process and Timeline
- Clinker, Cement and Concrete
- Lehigh Picton Cement and the Environment
- HeidelbergCement Sustainability

2. Public Meeting #1 Summary

- Public Meeting #1 Summary
- Public Meeting #2 Overview

3. Proposed ALCFs & Current Compliance

- ALCFs Use in Cement Plants in Ontario
- Waste Hierarchy and how ALCFs fit in
- Proposed ALCFs for the Picton Cement Plant
- Anticipated Supply of ALCFs
- Current vs Future Operations with ALCFs
- Conceptual Drawings of Storage & Conveyance

4. Sustainability & Climate Change

- Federal, Provincial and Cement Association Targets
- Canada's Emission Reduction Plan
- Picton CO_2 Roadmap – Pathway to Reduce GHGs
- Carbon Dioxide Emission Intensity Assessment

5. Results of Technical Studies & Next Steps

- ALCF Compliance & ECA Application
- O. Reg. 419/05 - ESDM Report
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Introduction

The Lehigh Picton Cement Plant is currently approved to operate under an Environmental Compliance Approval (ECA) using the following fuels:

- Coal
- Petroleum coke (Petcoke)
- Natural Gas

widely used, but high in carbon = high GHG emission

Lehigh is applying to use up to **200 tonnes per day of Alternative Low Carbon Fuels (ALCFs)** to reduce the amount of coal and petcoke used at the Facility. ALCFs supports:

- Lehigh Cements greenhouse gas (GHG) emissions reduction targets,
- Canada's 2030 Emission Reduction Plan, and
- Ontario's Plan for building a circular economy.

ALCFs are used throughout the world and are a key component of Lehigh's parent company, Heidelberg Cement's sustainability commitments.

Today we are here to share the progress on the project since the first public meeting in April 2022.

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ALCF Permitting Project Team

Lehigh Team

Nick Papanicolaou
Project Lead
Environmental Manager
Lehigh Picton Cement Plant

Carsten Schraeder
Plant Manager
Lehigh Picton Cement Plant

Melissa Eaton
Quality Control Manager
Lehigh Picton Cement Plant

Jasper van de Wetering
AFR/CO_2 Manager, Region Canada

Dave Melcher
Manager of Process Support

Ray Nobles
Alternative Fuel Manager, North America Northeast & Midwest Regions

WSP Golder Permitting Support Team

Jamie McEvoy
ALCF ECA Permit Project Manager
Senior Air Quality Engineer

Nadia Dabagh
Consultation Lead
Environmental Planner

Sarah Asselstine
Senior Planner / Engagement Specialist
Facilitator

Sean Capstick
Project Director
Senior Advisor – Climate Change Integration

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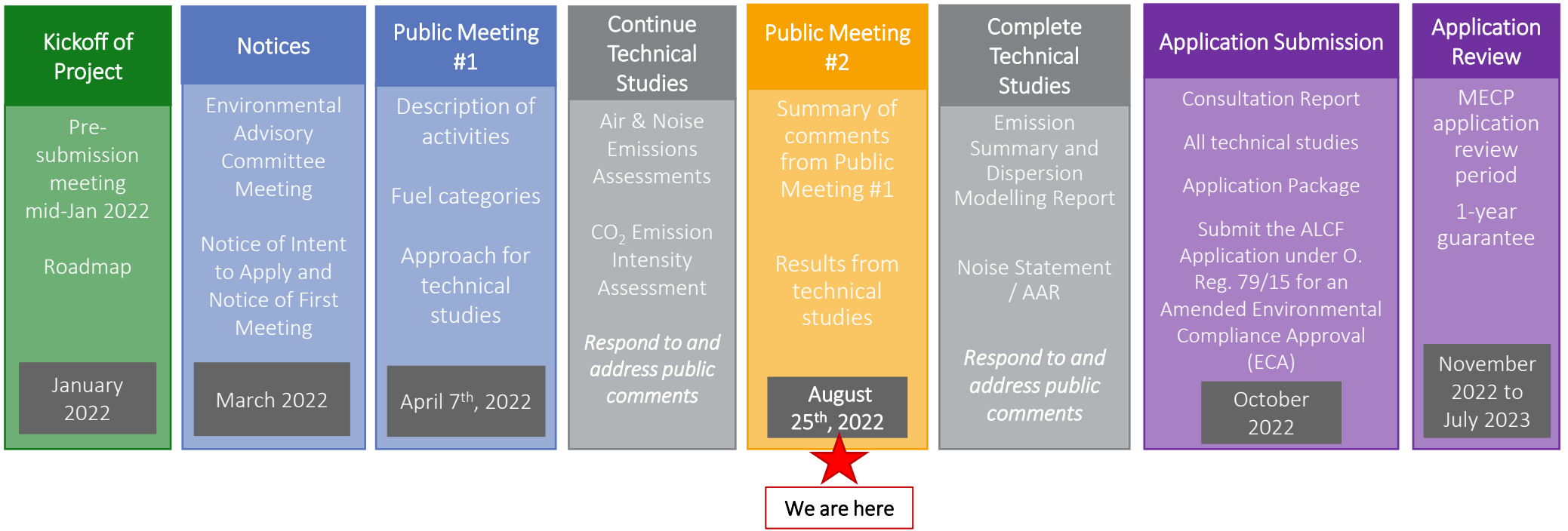
O. Reg. 79/15 ALCF - Permitting Process and Timeline



Lehigh Project Website:

www.LehighPictonALCF.ca

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Clinker vs Cement vs Concrete

Clinker

- Manufactured in a high temperature kiln
- Made of mostly *calcined* limestone plus alumina, silica & iron oxide.

Cement

- Binding element in concrete
- Clinker is milled into a fine powder and blended with limestone, gypsum and other additives to create cement.

Concrete

- Made of cement, sand, gravel
- Sets and hardens when combined with water
- Used for building: foundations, slabs, patios and masonry

https://www.nachi.org/constituent-materials-concrete.htm

https://www.thespruce.com/types-of-concrete-joints-845022

Concrete is the second most used material in the world after water[1]

[1] https://gccassociation.org/our-story-cement-and-concrete

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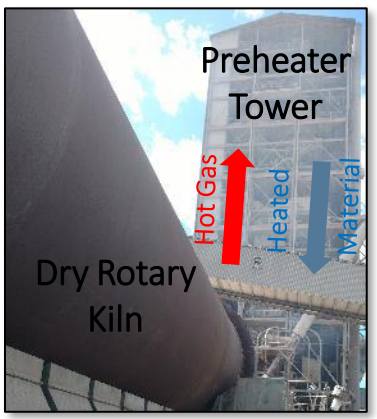
Picton Clinker & Cement Process Overview

Raw Material Processing

Limestone from Quarry is crushed and milled with other materials to form the raw meal to feed kiln.

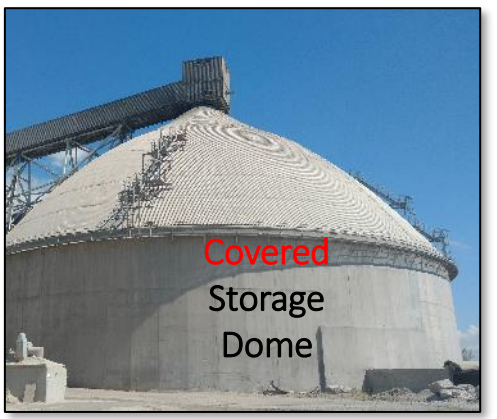
Raw Meal to Clinker Process

Raw meal is fed through the preheater tower into the rotary kiln. This design promotes energy efficiency and provides a scrubbing effect.



Clinker to Cement

The clinker is cooled and combined with gypsum and limestone in a grinding mill to make cement.



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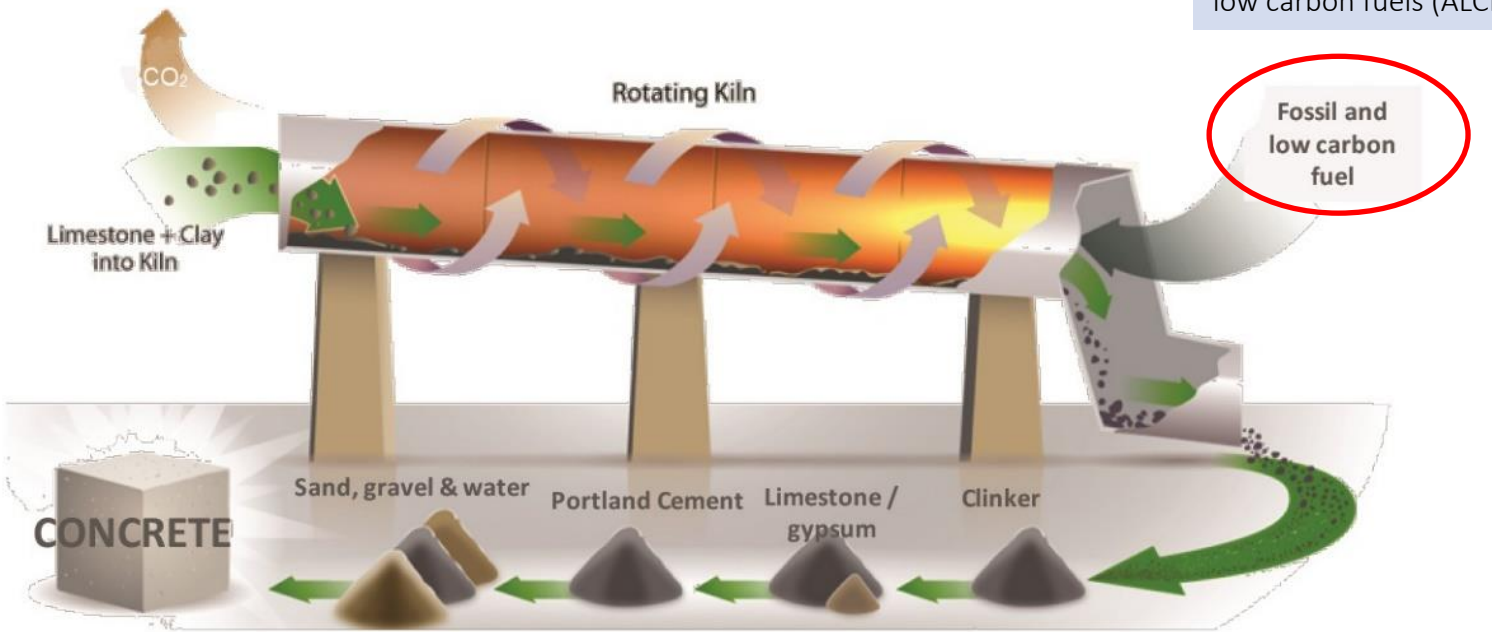
CO_2 and Cement

2/3 of CO_2 emissions result from calcination of limestone to lime: $CaCO_3$ → $CaO + CO_2$

1/3 of CO_2 emissions result from combustion of fuel and these can be reduced with alternative low carbon fuels (ALCF).



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Sustainability Commitments 2030

The Sustainability Commitments f… …ncompass the SDGs goals.

Driving Economic Strength and Innova…

"We will ensure sustainable profitability thro… effective management of all processes and re… and the continuing innovation of product… services."

…ving Excellence in Occupational Health & Safety

…e committed to continuously enhancing the …pational health and safety conditions of our …mployees, contractors, and third parties."

By 2050 at the latest, we want to be carbon neutral across our entire product portfolio and achieve "Net Zero" emissions.

increasing the use of alternative resources as substitutes for natural raw materials."

economic development of our neighboring communities and ensure transparent communication to all our stakeholders."

actively in an open and transparent manner with all our stakeholders."

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Sustainability Commitments 2030

The Lehigh Picton plant embraces the key Sustainable Development Goals and strives to ensure our products are competitive in the marketplace, we foster the conditions for continuous improvement, and ensure transparent communication as we seek to reduce GHG emissions and work with our community partners.

With this, we appreciate those who attended Public Meeting #1, we thank you for the comments and recommendations received thus far and look forward to working with our community on the ALCF and future projects.

A local company who cares about their employees and the communities where they live are cementing that commitment with a healthy donation.

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BREAK

Questions?

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Public Meeting #2 Agenda

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Summary of Public Meeting #1 Comments

All questions and comment responses will be documented in the Consultation Report that will be made publicly available on the Project website prior to the submission of the ECA Application.

- **84 written comments / questions** were submitted during Public Meeting #1 via the GoToWebinar Chat function
- Comments / questions submitted to the Project Team email:
  - **Fourteen (14) prior to Public Meeting #1**:
    - Members of the Public
    - Mississaugas of Scugog Island First Nation
    - Prince Edward County
    - Prince Edward County Conservancy
  - **Nine (9) following Public Meeting #1**:
    - Members of the Public
    - Mississaugas of Scugog Island First Nation
    - Curve Lake First Nation
    - Ministry of Tourism, Culture and Sport (MTCS)
    - Prince Edward County Conservancy
- The Project Team held individual meetings with the following:
  - Environmental Advisory Committee, Prince Edward County – March 1, 2022
  - Prince Edward County Conservancy – April 7, 2022
  - Mississaugas of Scugog Island First Nation – April 22, 2022

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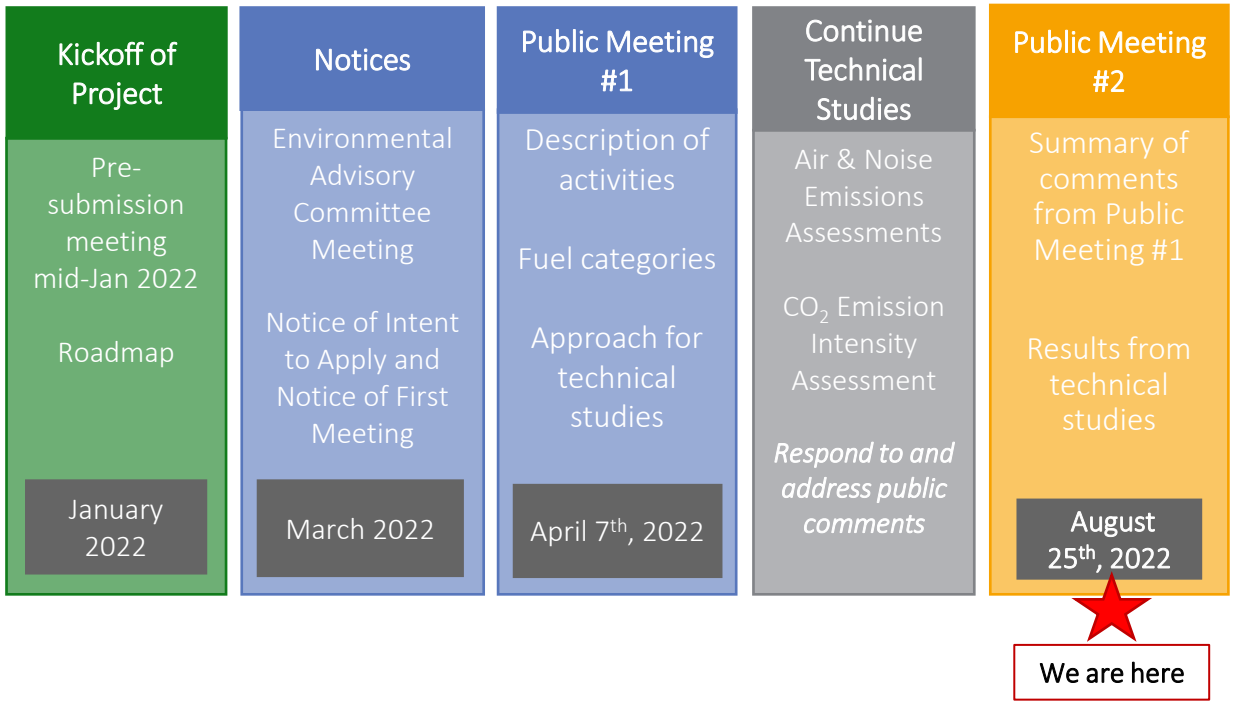
What We Heard at Public Meeting #1

Theme	Project Team Response
Opportunity to comment on the studies conducted in support of this Project	The technical studies will be uploaded to the Project Website prior to the ECA Application. Discussed later on this Public Meeting during the discussion on the technical studies results – Slides 34-52
ALCF transportation and storage to/at the Lehigh Picton Plant	Discussed later on this Public Meeting during the discussion on the conceptional engineering design of the storage / conveyance system – Slides 25 and 28
Impact on Highway 49 with additional trucks transporting ALCFs	Discussed later on this Public Meeting during the discussion on the traffic impact study – Slide 52
Greenhouse gas reduction	Discussed in detail previously on Slides 35 to 36
Are there potential impacts to water / air?	Discussed later on this Public Meeting during the discussion on the technical studies results – Slides 35 to 47

Purpose of Public Meeting #2



- Provide a summary of the comments received from Public Meeting #1
- Provide an overview and hear feedback on the Project progression since Public Meeting #1
- Provide an overview of the technical studies that have been prepared and the results of these studies

Lehigh Project Website:
www.LehighPictonALCF.ca

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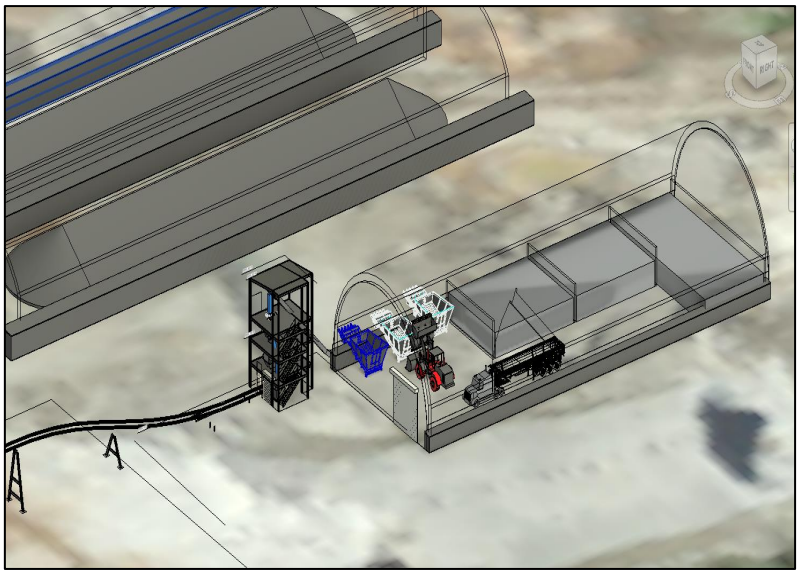
ALCFs use in Cement Plants in Ontario

Five grey (Portland) cement plants currently operate in Ontario

- *Lehigh Picton – seeking approval for the use of ALCFs of up to 200 tpd*
- St Marys Cement Bowmanville: permitted to use 400 tpd of construction, renovation and demolition waste, biomass and non-recyclable plastics and paper fibre/wood/plastic composites;
- St. Marys Cement St. Marys: seeking approval to use 175 tpd of construction and demolition by-products (shredded wood), non-recyclable plastics and paper fibre/wood/plastic composites, and non-tire derived rubber materials
- Lafarge Bath: local supplies such as construction and demolition site debris (wood based), railway ties, and other energy containing materials that cannot be recycled
- CRH (Mississauga): no formal application at this time.



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The Waste Hierarchy

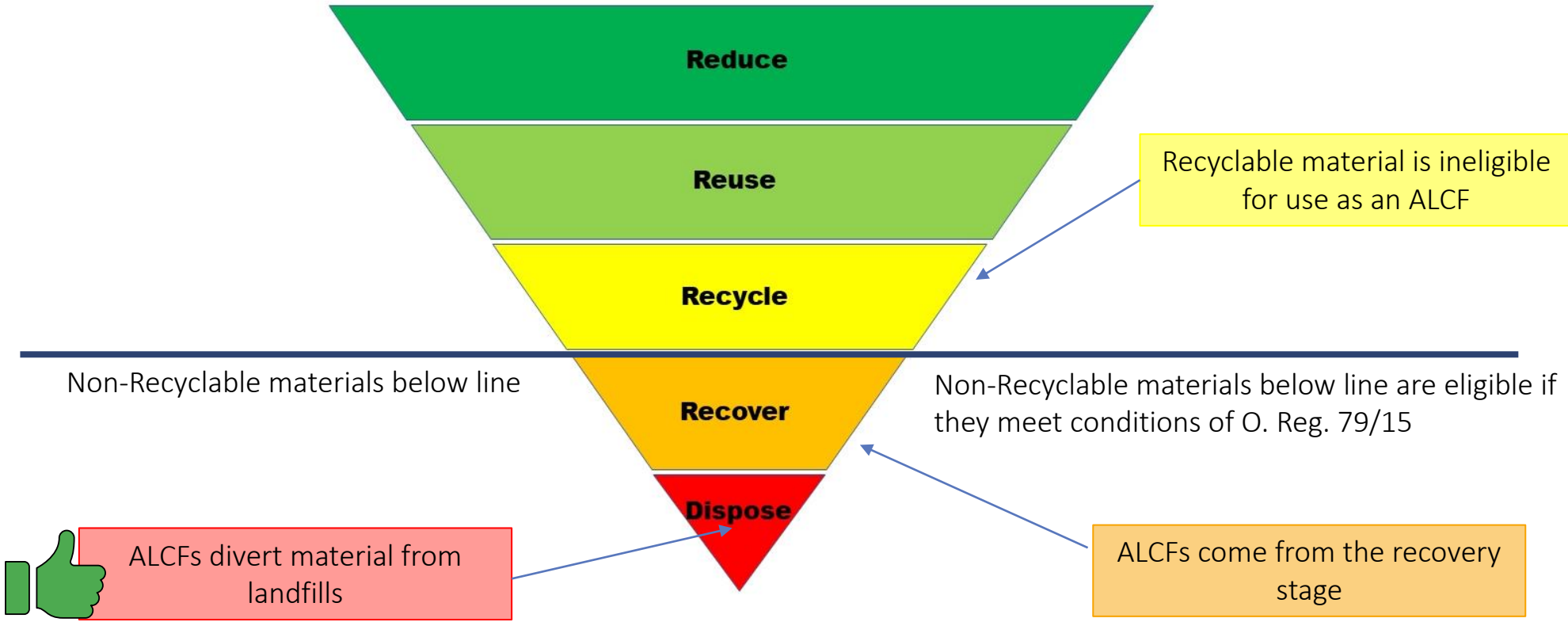

Image modified from: https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy

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Proposed ALCFs for Picton

- **ALCF from Construction and Demolition (C&D) materials**: primarily wood material with minor amounts of non-recyclable paper and plastic
- **ALCF from Industrial, Commercial, and Institutional (IC&I) materials**: primarily non-recyclable paper, plastic and textiles but including wood material, and tire fibre and fluff
- **ALCF from the combustible fraction of non-recyclable waste – Refuse Derived Fuel (RDF)**
- **Discarded treated seed**

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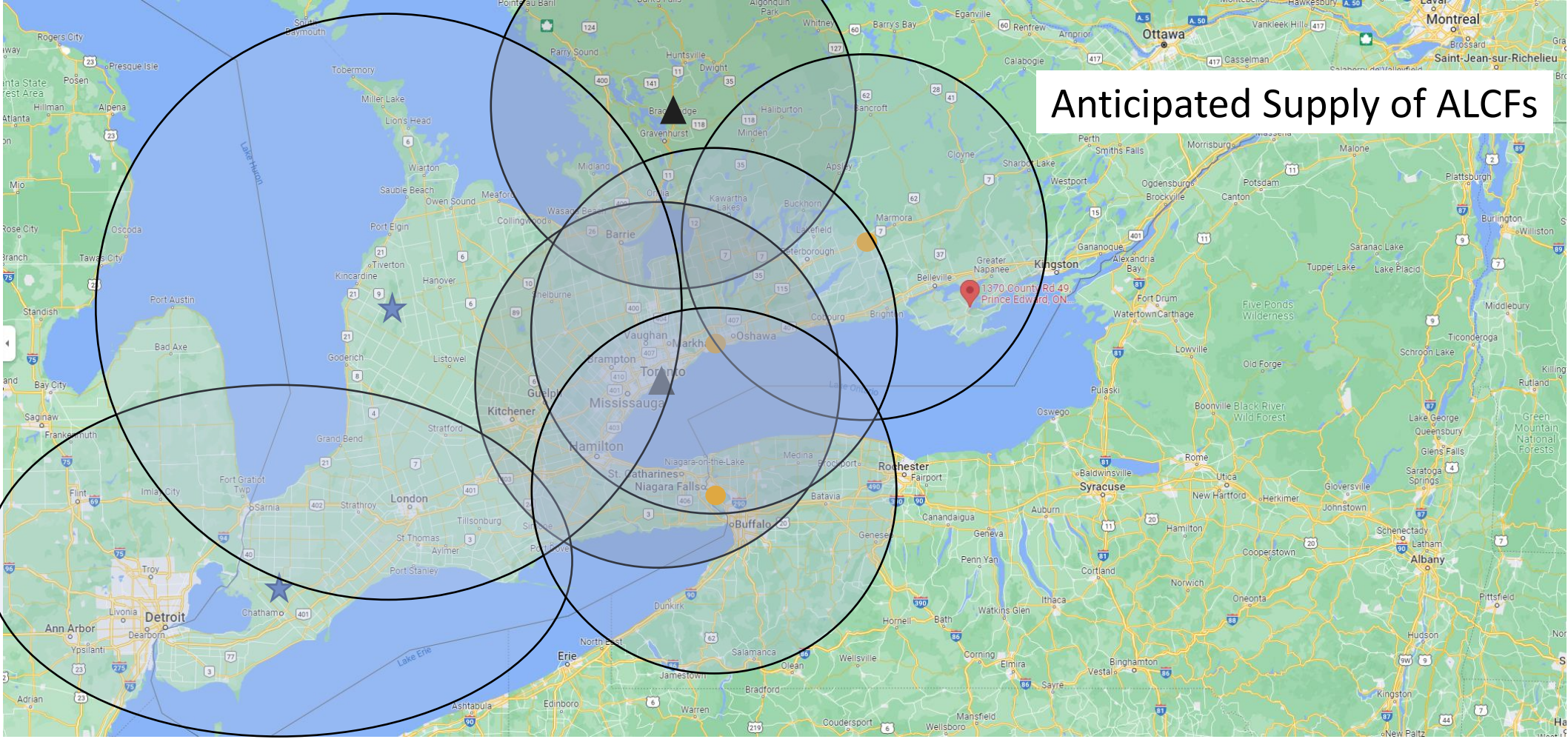
Anticipated Supply of ALCFs
1370 County Rd 49
Prince Edward, ON...
Ottawa
Montreal
Kingston
Toronto
Hamilton
Buffalo
Rochester
Syracuse
Albany
London
Detroit
Erie
Lake Huron
Lake Erie
Legend
Lehigh Picton Cement Plant
Discarded Treated Seed
Industrial, Commercial, and Institutional (IC&I)
Construction and Demolition (C&D)

Current vs Future Operations with ALCFs

Current Operations at Picton

Material Receiving & Process

- Conventional Fuels arrive via boat and NG pipeline
- Some Raw materials arrive via truck

Compliance

- Continued compliance with all provincial and federal regulations including O. Reg. 419/05 air limits.
- Dust Best Management Practices Plan (BMPP)
- Noise Abatement Action Plan (NAAP)
- Immediate response and follow-up on complaints

Monitoring

- Kiln 4 and Kiln 4 Bypass CEMS
- Annual Source Testing

Differences with Future Operations at Picton with ALCFs

Material Receiving & Process

- **Reduced** amount Conventional Fuels arrive via boat due to ALCF usage and increase in NG
- **Increase** in trucks arriving with ALCFs
- New Storage Facility and conveyance equipment
- Increased fulltime employment for ALCF use

ECA Compliance

- New requirements related to ALCFs under O. Reg. 79/15
  - Fuel Handling & Testing Manual, Fuel Material QA/QC
  - Increase in source testing requirements under O. Reg. 79/15

**The above differences are in addition to the current operations.*

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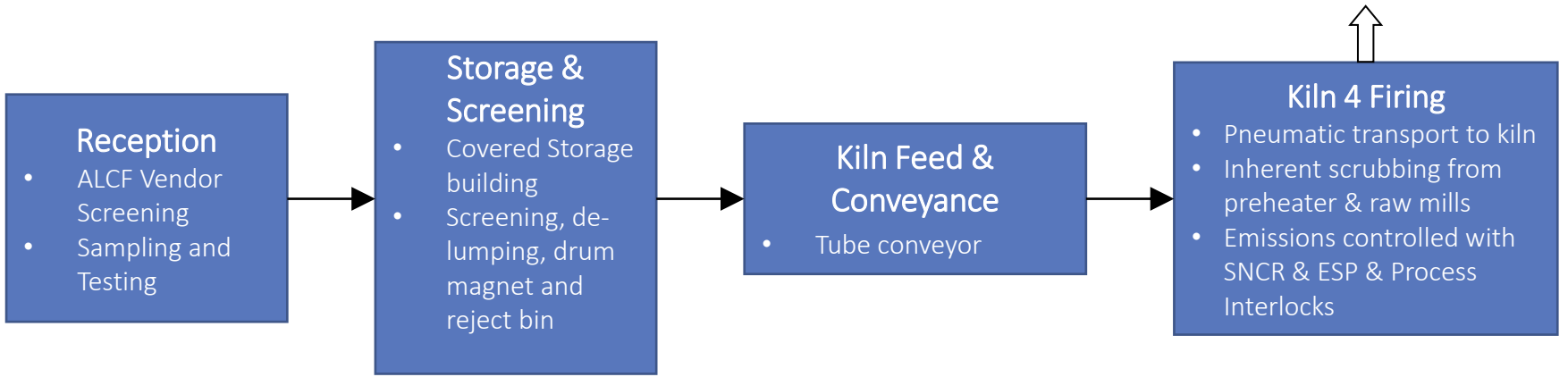
ALCF Material Handling Process Flow Diagram



- ALCFs Handling Procedures and Testing Manual will be relied on to ensure fuels are acceptable prior to receipt.

LEGEND

Material Flow

Emissions Release through Process Area

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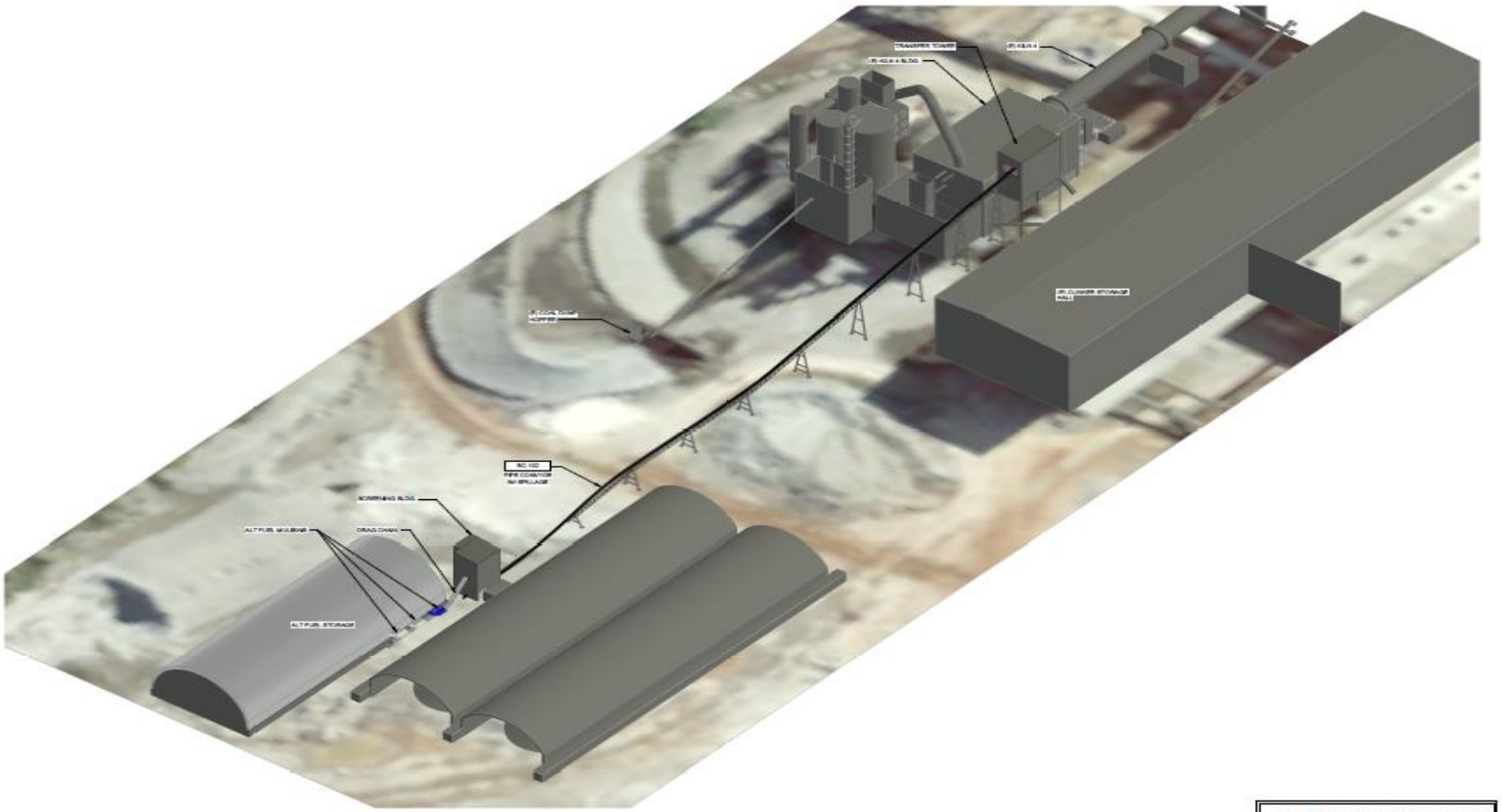
Review of Conceptual Engineering Phase I



3D VIEW - OVERALL SITE

PRELIMINARY
NOT FOR CONSTRUCTION

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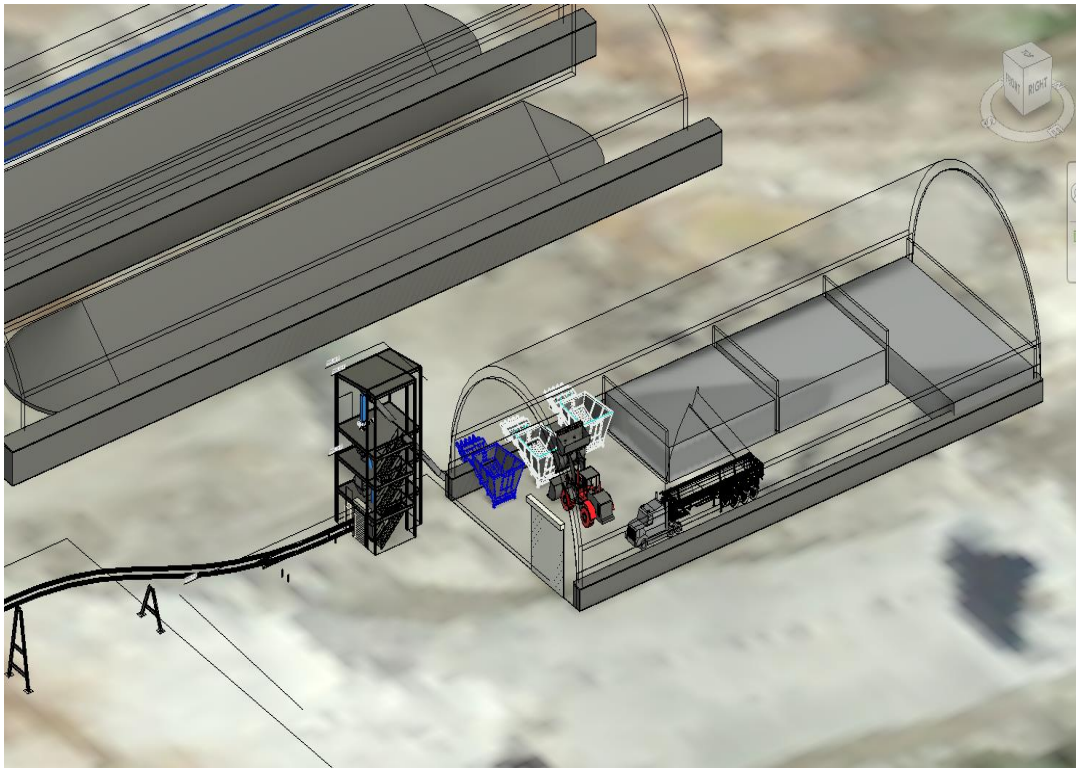
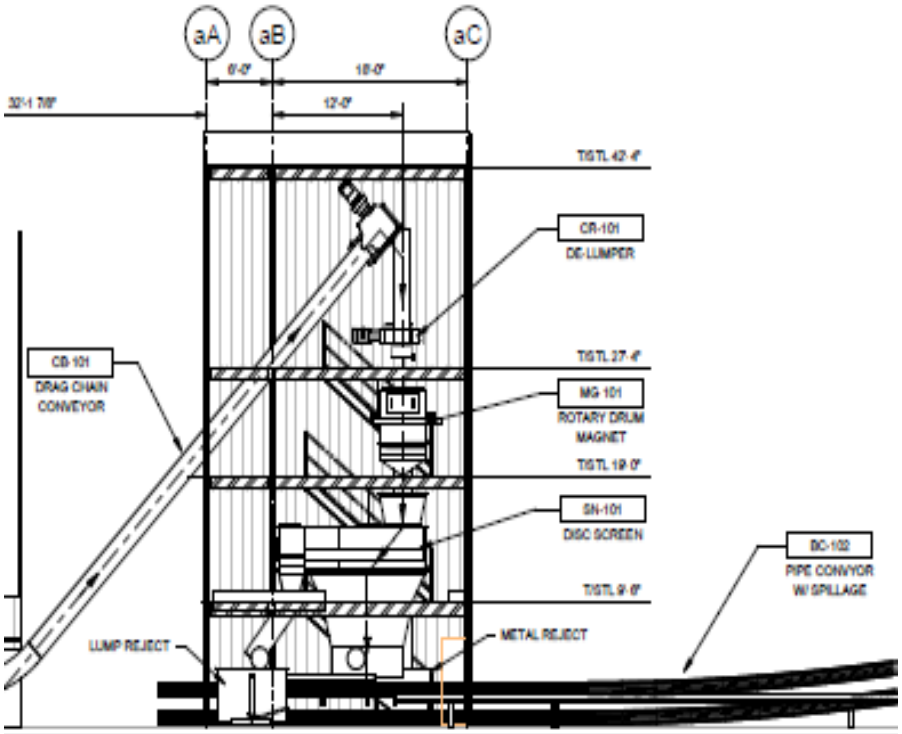
Review of Conceptual Engineering Phase I

Storage and Screening Building





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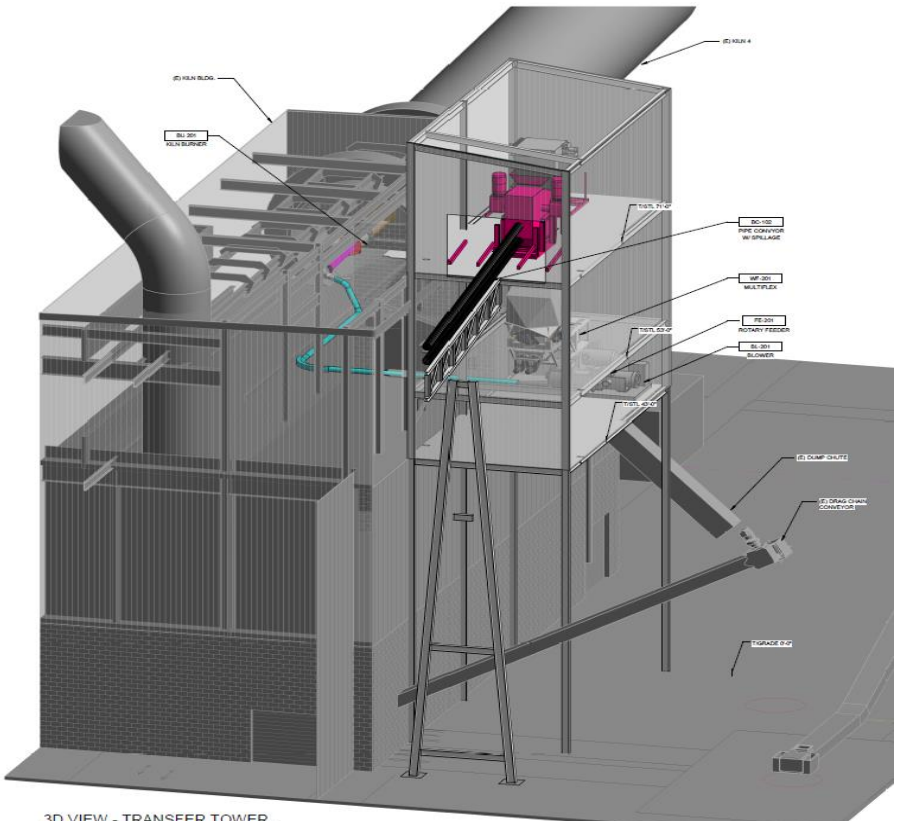
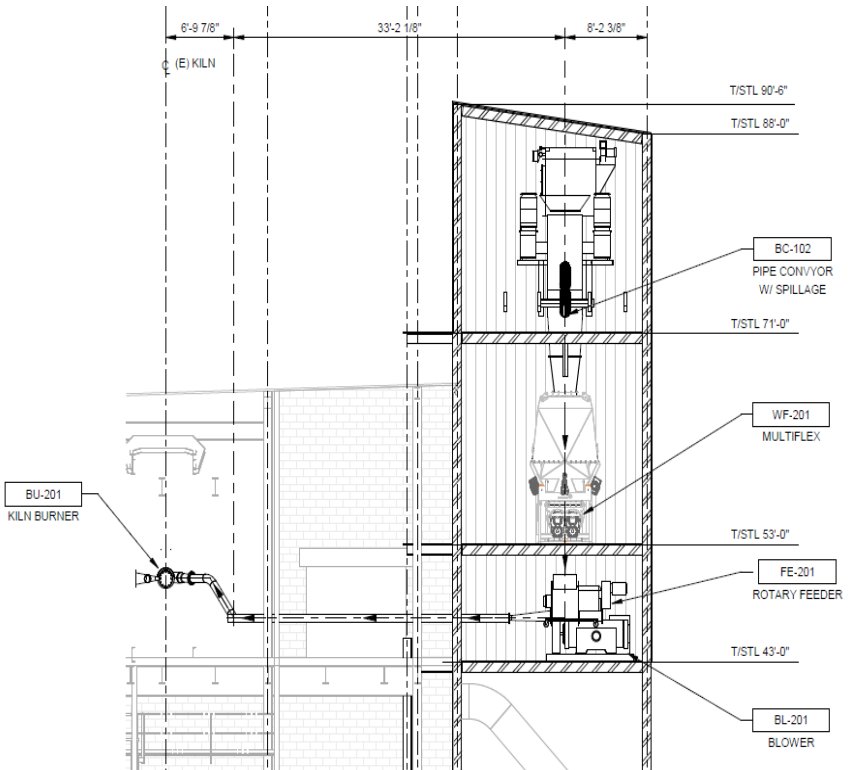
Review of Conceptual Engineering Phase I

Kiln Firing





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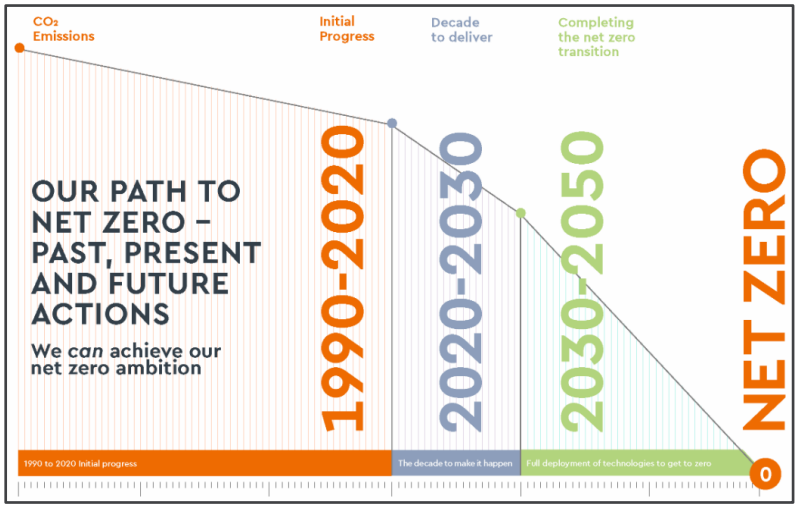
CO_2 Emission Reduction Targets and Plans

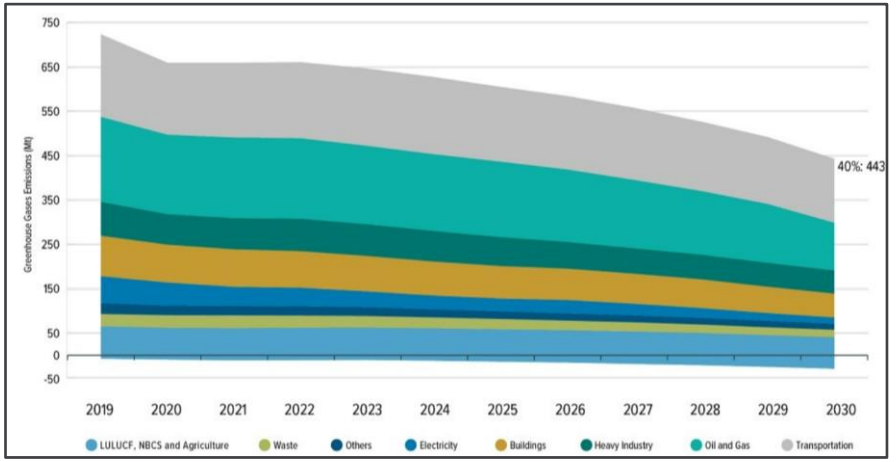
Lehigh is applying to use up to 200 tonnes of Alternative Low Carbon Fuels (ALCFs) per day to replace coal and petcoke used currently.

ALCF supports:

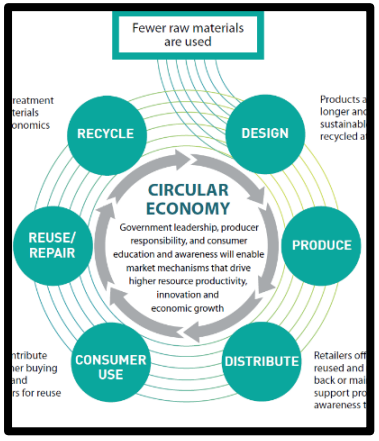
- Lehigh Cement and the Canadian Cement Industry's greenhouse gas (GHG) emissions reduction targets,
- Canada's 2030 Emission Reduction Plan, and
- Ontario's Plan for building a circular economy.



Cement Association Net Zero Path



Canada's 2030 Reduction Plan



Ontario's Plan for Circular Economy

https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030.html
https://cement.ca/sustainability/our-roadmap-to-net-zero/
https://www.ontario.ca/page/strategy-waste-free-ontario-building-circular-economy#:~:text=A%20circular%20economy%20protects%20the%20environment.&text=Data%20tells%20us%20that%20increasing,from%20Ontario%20roads%20each%20year.

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Canada's Emission Reduction Plan

KEY FACTS

- Canada's cement and concrete industry contributes approximately **158,000 direct and indirect jobs across the country, while contributing $76 billion dollars in direct, indirect, and induced economic impact** into the Canadian economy.
- Canada's Emissions Reduction Plan projects a reduction of 25 megatonnes of GHG emissions from all heavy industry between 2019 and 2030.
- Canada's cement and concrete industry has engaged in a partnership with Industry, Science and Economic Development Canada (ISED) to achieve net-zero concrete by 2050.
- The Global Cement and Concrete Association (GCCA) released its Net-Zero Global Roadmap in October 2021. Set to be released in 2022, Canada's cement and industry roadmap to net-zero concrete will be unique to Canada's economy and policy environment while aligning with its international peers. It will aim to reduce $C0_2$ emissions by up to 40% by 2030 and deliver net-zero concrete by 2050.
- A transition to Alternative Low Carbon Fuels has been identified as a key component of cement and concrete GHG Reduction roadmaps around the world.

https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030.html

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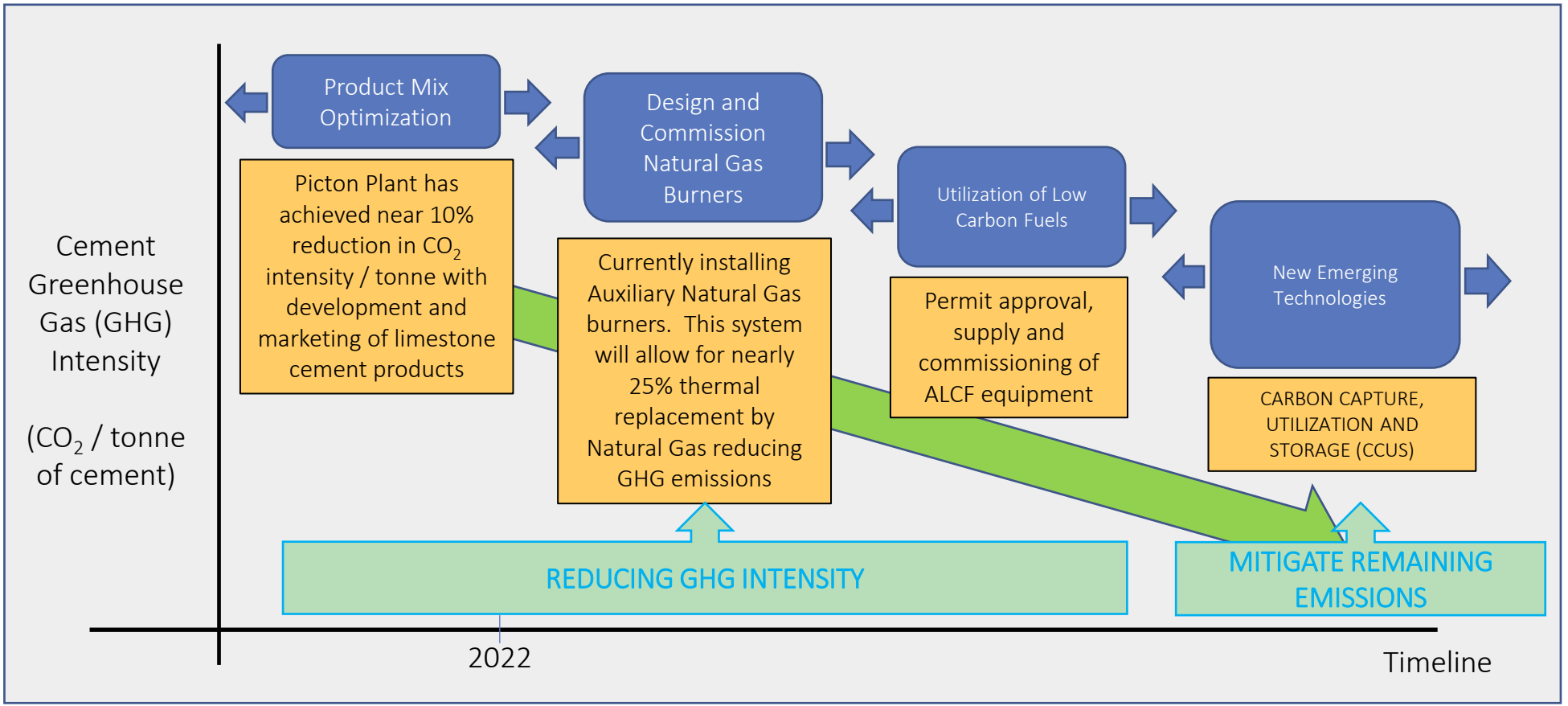
Picton CO_2 RoadMap – Pathway to Reduce GHGs



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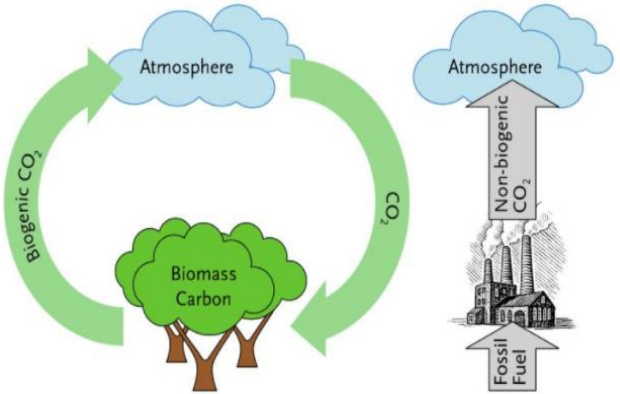
CO_2 Emission Intensity Assessment



What is CO_2 emission intensity?

- An indicator of the amount of CO_2 that is produced when a fuel is combusted.
- Expressed as kg CO_2 produced per GJ of fuel consumed.
- A lower CO_2 emission intensity value means the fuel will release less CO_2 per unit of energy.

How is CO_2 emission intensity measured for this project?

- CO_2 emission intensity calculations are based on the amount of <u>total</u> and <u>biogenic</u> carbon in the fuel.
- Biogenic carbon is the portion of carbon in fuel that is derived from biomass such as plants, animals, micro-organisms, or other organic matter. In the case of ALCF this is normally wood, paper, and cardboard.
- Conventional fuels (i.e. coal, petcoke) – CO_2 emission intensity is based on the <u>total</u> amount of carbon in fuel, as they contain no biogenic carbon.
- ALCF – CO_2 emission intensity is based on the amount of **non**-biogenic carbon in the fuel. i.e. CO_2 from biogenic carbon is considered carbon neutral.

Biological Carbon Content → CO_2 Emission Intensity

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CO_2 Emission Intensity Assessment

- Parameters of CO_2 Emission Intensity calculation (preliminary):

Type of Fuel	Conventional Fuels		Alternative Low Carbon Fuels			
	Coal[a]	Petcoke[b]	C&D[c]	IC&I[d]	RDF[e]	Discarded Treated Seed
High Heat Value [GJ/t]	28.1	33.2	15.7	25.9	21.7	14.6
Total carbon [% wt]	69.2%	82.0%	37.6%	57.0%	45.8%	35.2%
Non-biological carbon [% wt][f]	100%	100%	8%	36%	36%	0%
CO_2 Emission Intensities [kg CO_2/GJ]	90.2	90.7	17.5	51.2	61.1	0.0
Notes:	(a) Coal parameters are based on the average of eight samples (b) Petcoke parameters are based on the average of six samples (c) Construction and Demolition waste. C&D parameters are based on the average of ten samples (d) Industrial, Commercial, and Institutional waste. IC&I parameters are based on the average of two samples (e) Refuse Derived Fuel. Parameters are based on a single sample (f) Non-biological carbon is expressed as a percentage of the total carbon in each fuel.					

Conventional Fuel

CO_2 emission intensity = CC_{total} x 3.67/HHV

ALCFs

CO_2 emission intensity = CCnon-bio x 3.67/HHV

CCnon-bio = total carbon [% wt] x (1 - biological carbon [% wt])

- The ALCFs meet the requirements of O. Reg. 79/15:
  - CO_2 emission intensity: ALCFs < Coal and Petcoke ✓
  - ALCFs High Heat Value > 10 GJ/t ✓

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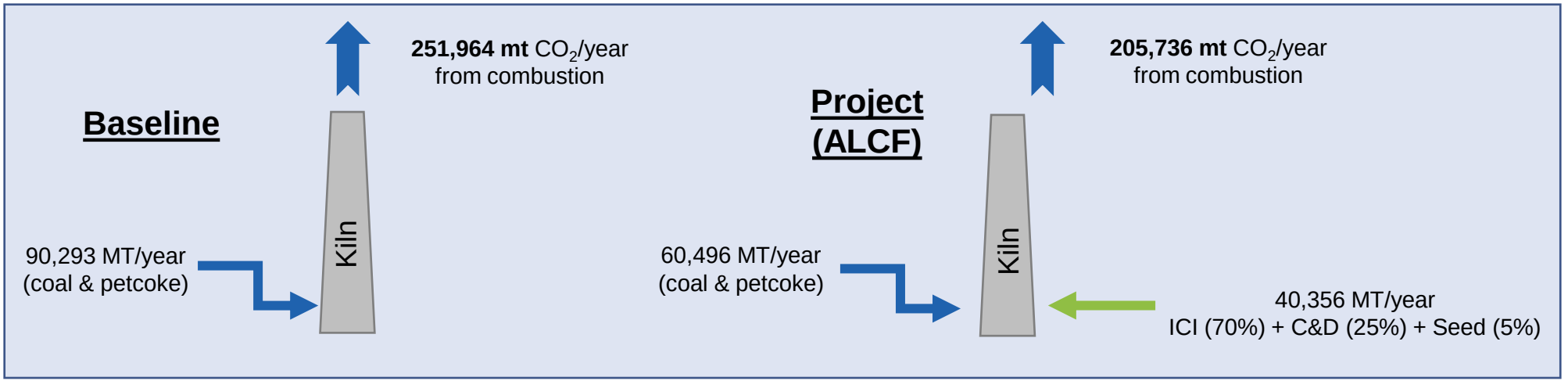
CO_2 Emission Intensity Assessment

- Picton's annual thermal energy requirement is approximately 2,784,000 GJ/year.
- Compared a Baseline Scenario (46% coal, 54% petcoke) to a Project scenario using a blend of ALCFs to provide 30% of energy required (ALCF Mix: 70% ICI, 25% C&D and 5% seed).



Fuel	Total [kg CO_2/GJ]	% biogenic carbon
Coal	90.2	—
Petcoke	90.7	—
Natural Gas	50	—
C&D	17.5	80%
ICI	51.2	37%
RDF	61.1	21%
Seed	0.00	100%
ALCF Blend	**40.2**	**51%**

46,228 mt of CO_2 reduced!

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CO_2 Emission Intensity Assessment

The utilization of ALCFs at the Lehigh Picton Plant instead of coal and petcoke could reduce non-biogenic CO_2 emissions by approximately **46,000** mt (tonne) CO_2 annually.

https://cpj.ca/wp-content/uploads/1TonneGHGsEquivilency.png

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BREAK

Questions?

Public Meeting #2 Agenda

1. Background

- Introduction & Project Team
- O. Reg. 79/15 Permitting Process and Timeline
- Clinker, Cement and Concrete
- Lehigh Picton Cement and the Environment
- HeidelbergCement Sustainability

2. Public Meeting #1 Summary

- Public Meeting #1 Summary
- Public Meeting #2 Overview

3. Proposed ALCFs & Current Compliance

- ALCFs Use in Cement Plants in Ontario
- Waste Hierarchy and how ALCFs fit in
- Proposed ALCFs for the Picton Cement Plant
- Anticipated Supply of ALCFs
- Current vs Future Operations with ALCFs
- Conceptual Drawings of Storage & Conveyance

4. Sustainability & Climate Change

- Federal, Provincial and Cement Association Targets
- Canada's Emission Reduction Plan
- Picton CO_2 Roadmap – Pathway to Reduce GHGs
- Carbon Dioxide Emission Intensity Assessment

5. Results of Technical Studies & Next Steps

- ALCF Compliance & ECA Application
- O. Reg. 419/05 - ESDM Report
- Kiln Emissions
- Assessment of Emissions from use of ALCF
- Process Controls/Interlocks
- Acoustic (Noise) Assessment Report (AAR)
- Additional Study Considerations
- Next Steps: Consultation Report & ECA Application

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ECA Application & ALCF Compliance

- Lehigh Picton Cement Plant is preparing the application to amend the current ECA for the Picton Cement Plant to allow for the permanent use of ALCFs (proposed fuels were discussed on slide 22).

- Lehigh Picton Cement Plant's application will meet all the requirements under Section 9 of the *Environmental Protection Act* and has three key regulations and guidelines for this Project

O. Reg. 419/05 – Local Air Pollution

- Emission Summary and Dispersion Modelling (ESDM) Report

MECP Noise Guideline (NPC 233 & NCP 300)

- Acoustic (Noise) Assessment Report

O. Reg. 79/15 - ALCFs

- CO_2 Emission Intensity Report
- Consultation Report

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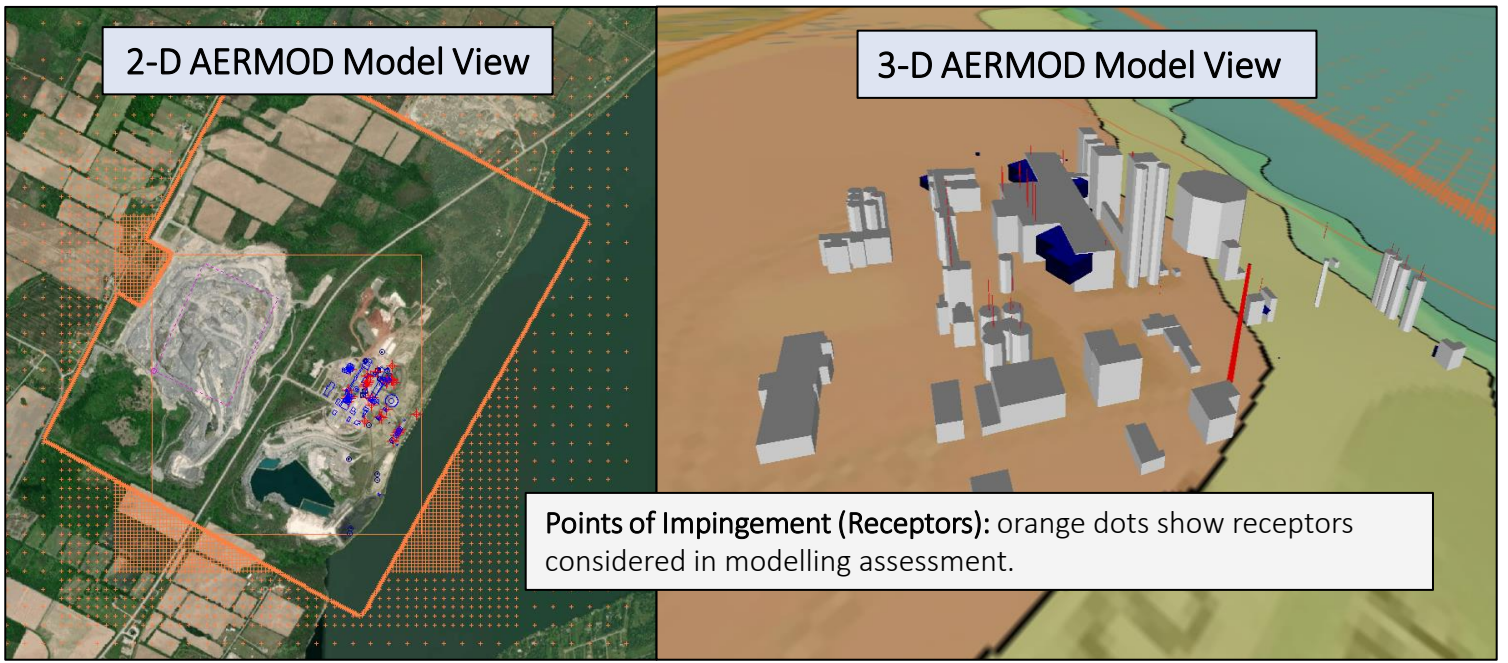
O. Reg. 419/ 05 & Emission Summary and Dispersion Modelling (ESDM) Report

- O. Reg. 419/05 prescribes the emission estimation methods, air dispersion modelling requirements and the air concentration limits at the point of impingements (receptors) for the Facility.
- O. Reg. 419/05 requires facilities to not underestimate emissions and assess a maximum emissions scenario for all contaminants of concern.
- The majority of the emissions from the Facility are emitted out of the Kiln 4 Main Stack that is equipped with **an electrostatic precipitator (ESP) pollution control** device & continuous emissions monitoring system **(CEMS)**



Key changes from the previous ESDM Report:

- ALCF emission estimate screening and dispersion modelling of compounds.
- Removal of Kiln 3 from the assessment –not operating and no future plan to operate

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Kiln Emissions

Kiln 4 + Bypass Stack Emission Assessment for ALCF's

- Types of Emissions from the kiln?
  - Combustion exhaust gases (mostly water & CO_2) , excess air (mostly nitrogen and excess oxygen to promote good combustion)
  - Criteria Air Contaminants: Particulates, Oxides of Nitrogen (NOx), Sulphur dioxide (SO_2), carbon monoxide (CO)
  - Trace incomplete combustion products: Volatile Organic Compounds (VOC) & Polycyclic Aromatic Hydrocarbons (PAHs)
  - Trace Inorganic, metals & chlorinated compounds (e.g., HCl)
  - Dioxins & furans
  - Ammonia (naturally occurring in limestone & added to control NOx with SNCR)

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Expected Changes to Emissions with ALCFs

Compound Groups	Emission Control	Change from Conventional Fuels	Rationale	Monitoring
Combustion Air & Water	• none	**Decrease in non-biogenic CO2**	• ALCFs reduce non-biogenic CO2 emissions; majority of these compounds are air (Nitrogen and Oxygen) • ALCF's may contain higher moisture leading to increases water vapor	CEMS
Particulates (dust)	• Material Handling in building • Kiln 4 – ESP & Kiln 4 Bypass dust collector	Negligible	• Dust from truck traffic will be a negligible increase • Material Handling will be carried out inside a building and covered conveyors • Dust from the fuel combustion is insignificant	CEMS (opacity) Fugitive Dust BMPP
Carbon Monoxide	• good combustion in the CEMS	Negligible	• No material change to combustion efficiency is anticipated	CEMS (monitor combustion)
Oxides of Nitrogen (Nox)	• CEMS & SNCR (ammonia injection)	Negligible	• NOx is mostly generated from the temperature of the combustion, not the fuel type. SNCR system operation to controll NOx emissions	CEMS
Sulphur Dioxide (SO2)	• Kiln 4 – Lime injection (currently being trialed)	Negligible	• SO2 is mostly a result of the raw materials (limestone). The fuels will be screened to be low in sulphur.	CEMS
Trace Incomplete Combustion Products: VOC & PAHs	• Source Testing • Interlock	Negligible	• It is not expected that VOC & PAH emissions will change due to the high temperature and residence time of the kiln.	Source Testing
Trace inorganic metals & chlorinated compounds	• **Kiln 4 - ESP** • **Incoming testing and fuel handling on ACLF materials**	**May Increase**	• **Based on material lab analysis, certain inorganic materials & metals may increase. These increases in potential emission estimates have been assessed and will be discussed on the next slide.** • **ALCFs may have higher chlorine content. Emission increases have been estimated and assessed.**	**Incoming Fuel Handling** **Source Testing**
Dioxins & Furans	• Source Testing • Interlock	Negligible	• It is not expected that D&F emissions will change due to the high temperature and residence time of the kiln.	Source Testing
Ammonia	• ammonia used to control NOx	Negligible	Ammonia (naturally occurring in limestone & added to control NOx)	Source Testing

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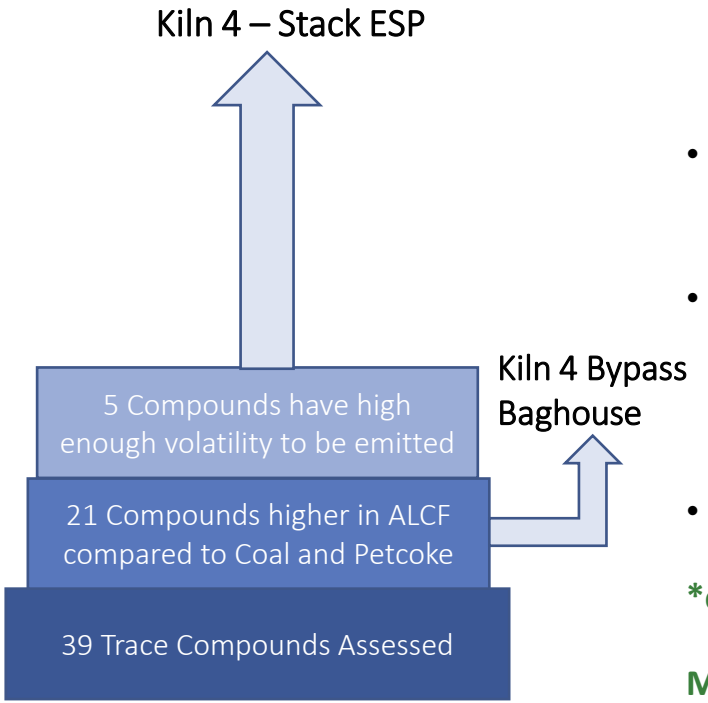
Air Quality – ALCFs Emission Estimates



- **39 trace inorganic metals & chlorinated compounds** from the proposed ALCFs and compared to the existing fuels of petcoke and coal based on lab analysis of the composition - **Mass Balance Approach**
- 21 compounds have higher concentrations in one of the four ALCFs groups compared to the existing fuels and were applied and estimated from **the Kiln 4 Bypass Stack.**
- 5 compound emission rates were applied to the Kiln 4 stack **(cobalt, HCl, mercury phosphorous and tin)**. The other compounds were excluded due to volatility and would condense on the raw materials and eventually be bound in the clinker matrix and not emitted.
- Source testing on the Kiln 4 and Kiln 4 Bypass stack will be a requirement of the ECA

conservative assessment as it assumes the worst case of any fuel at any given time

Method references the European Commission Best Available Techniques (BAT) Reference Document for the Production of Cement, Lime and Magnesium Oxide

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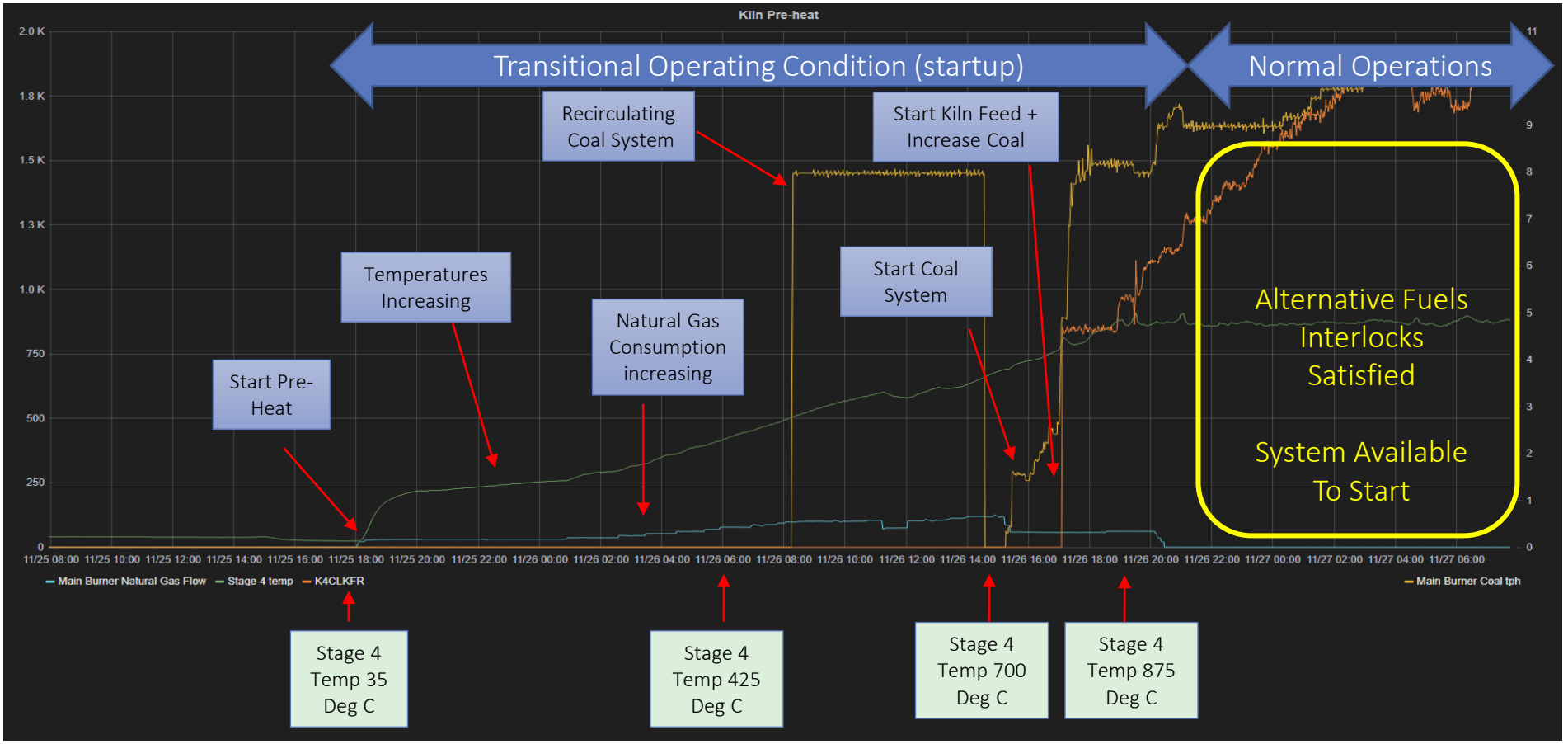
Process Controls / Interlocks



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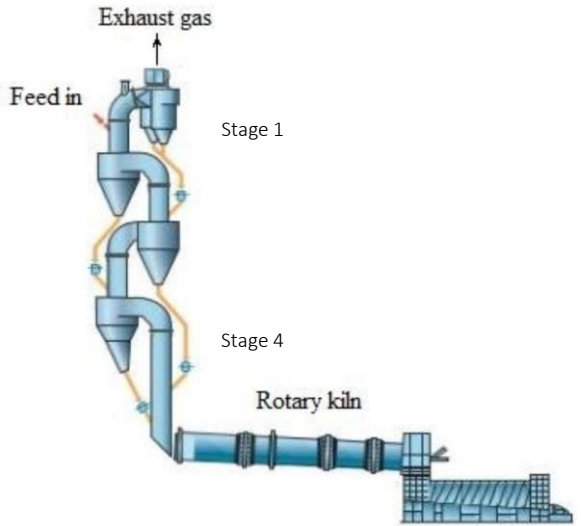
Process Controls / Interlocks

The process interlocks will be utilized to control the use of the ALCF Kiln Burner via the following conditions;

- The oxygen level at the top of the tower must not be less than 1.5%
- 2 of the 4 temperature probes at the top of the tower (stage 1) must not be greater than 600 Deg C
- The temperature at the bottom (stage 4) of the tower must be less than 920 Deg C
- The stage 4 CO level must not be greater than 2.85% (instantaneous)
- The stage 4 CO level must not be greater than 1.5% (time-delayed)
- The main burner must be running, and the feed is on the kiln
- At least 3 of the 4 Loesche fans must be running



If the process interlock is not satisfied, the new ALCF Burner cannot start or will trip if running.

The above conditions ensure that ALCF use is under ideal combustion conditions (normal operation) whereby high temperatures (2000 Deg C in kiln), appropriate Oxygen levels and long residence time to allow for complete combustion and fitting of the modelled assessment.

*Additional items could be added by MECP, certified technicians and TSSA approvals upon their review

https://www.researchgate.net/figure/Rotary-kiln-with-preheater-cyclone-27_fig1_322289513

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ESDM Results

ESDM Assessment Results

- All compounds considered were found to be below their MECP Air Quality Limits
- It is not anticipated based on our estimates that the ALCFs will have a significant impact on emissions
- Of the 89 unique contaminants assessed, 42 were considered negligible, 14 were less than 1%, The remainder were below their respective limits.
- The following tables presents the results of the AERMOD modelling and compounds that were found to be within **25% of their respective Limit** for both the normal (considers ALCF use) and the TOC scenarios and compounds which **we received comments on in Public Meeting # 1**

Emission Summary Table - Normal Operating Conditions (preliminary)

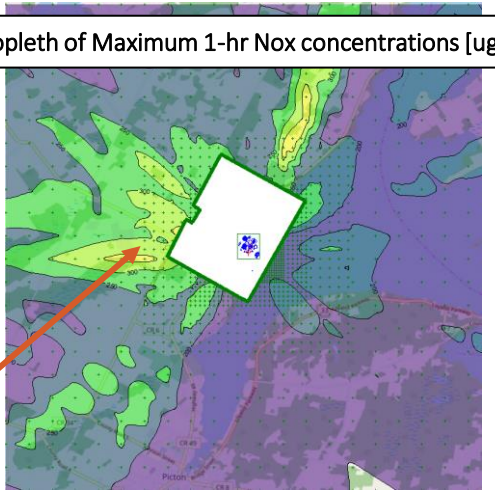
Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Percentage of MECP Limit [%]
Crystalline Silica	14808-60-7	1.89E+00	2.41E+00	24	5	Health	48%
Iron	7439-89-6	8.41E-01	1.40E+00	24	4	Health	35%
Mercury	7439-97-6	4.45E-02	1.45E-02	24	2	Health	<1%
Lead	7439-92-1	1.90E-02	1.44E-02	24	0.5	Health	3%
Lead	7439-92-1	1.90E-02	5.60E-03	30-day	0.2	Health	3%
Dioxins and Furans (TEQ)	N/A	1.87E-09	5.90E-10	24	0.0000001	Health	<1%
Hydrogen chloride	7647-01-0	3.17E+00	9.79E-01	24	20	Health	5%
Nitrogen Oxides	10102-44-0	1.19E+02	3.36E+01	24	200	Health	17%
Nitrogen Oxides	10102-44-0	1.19E+02	1.42E+02	1	400	Health	36%
SPM	N/A	2.00E+01	3.52E+01	24	120	Visibility	29%

Emission Summary Table - Transitional Operating Conditions (preliminary)

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Percentage of MECP Limit [%]
Nitrogen Oxides	10102-44-0	2.17E+02	6.61E+01	24	200	Health	33%
Nitrogen Oxides	10102-44-0	2.17E+02	2.72E+02	1	400	Health	68%
Sulphur dioxide	7446-09-5	1.79E+02	2.40E+02	1	690	Health & Vegetation	35%
SPM	N/A	2.46E+01	3.52E+01	24	120	Visibility	29%

Meterological anomalies removed

Isopleth of Maximum 1-hr Nox concentrations [ug/m3]



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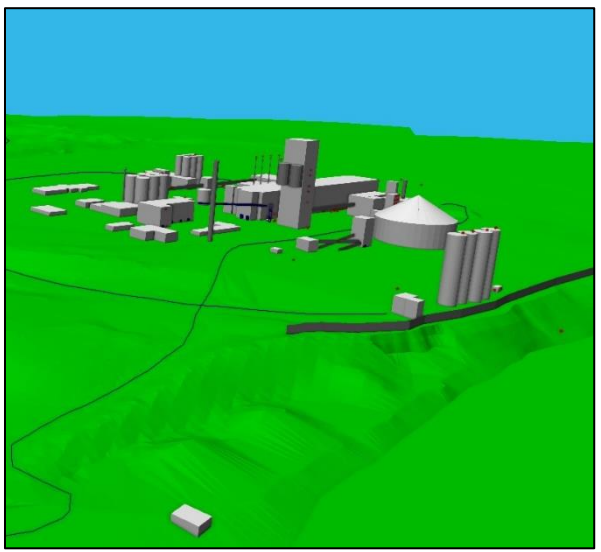
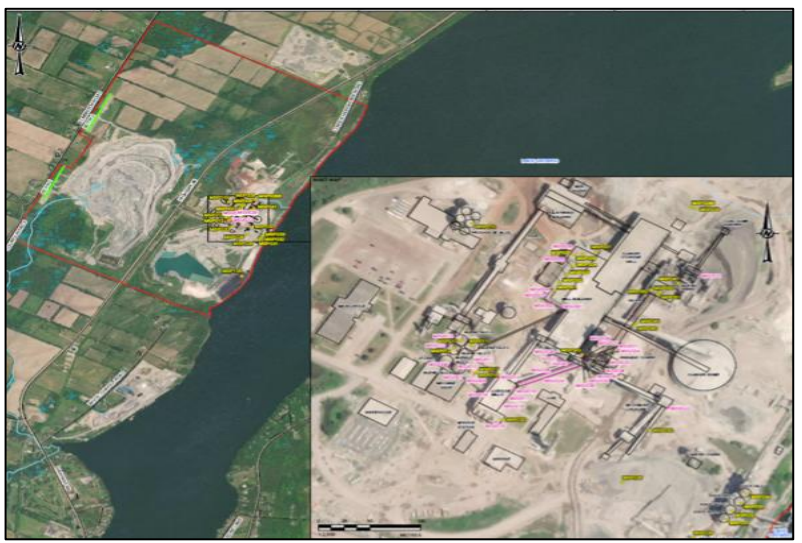
Acoustic (Noise) Assessment Report

Compliance with Ministry Noise Limits (NPC 233 and NPC 300)

- The Picton Cement Plant is required to meet the Ministry noise limits at neighboring off-site receptors and maintain and up-to-date Acoustic Assessment Report (AAR)
- The AAR assesses the combined noise impacts, from all activities on-site, at receptors using a 3-D noise model
- The Picton Cement Plant is currently working through a Noise Abatement Action Plan (NAAP) to reduce noise levels implementing improvements annually to existing equipment.





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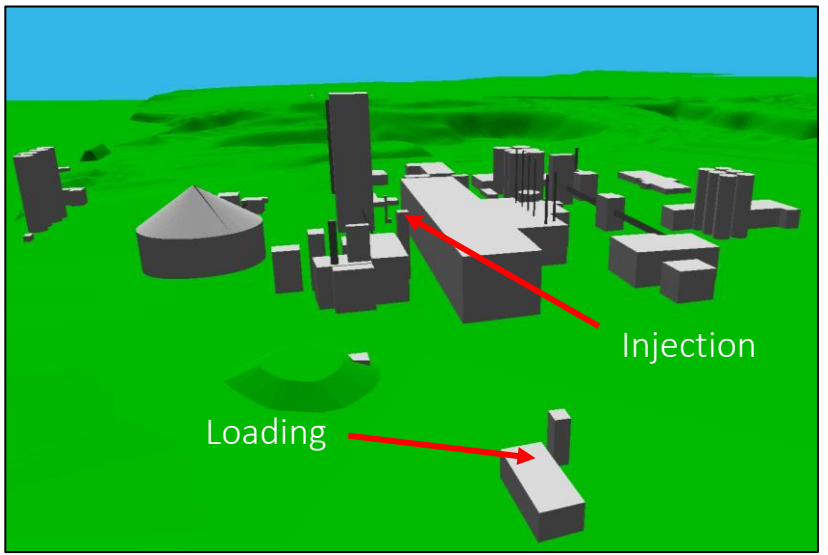
Noise Assessment

Modelling of noise emissions associated with the ALCF Project sources was completed using CadnaA noise modelling software.

Major noise sources associated with the ALCF Project include:

- Blower (Rotary Feeder) – Injection
- Loader – Loading
- Shipment Truck – Loading
- Disc Screen – Loading
- Metal Reject Collection Bin – Loading

Equipment considered for the ALCF Project will be housed in dedicated structures to minimize noise emissions into the environment.



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Noise Assessment

Modelling results

Table below summarize the predicted ALCF Project nighttime (most stringent limits) noise contributions at the relevant point of reception (POR) and outdoor points of reception (OPOR) located in four cardinal direction centered on the Lehigh facility.

Point of Reception	ALCF Project Contributions (dBA)	Facility Contributions[a] (dBA)	Combined Noise Levels (ALCF plus Facility) (dBA)	Change (dB)
POR003	21.5	32.8	33.1	0.3
OPOR003	21	29.0	29.6	0.6
POR006	22.2	31.8	32.3	0.5
OPOR006	22.3	31.3	31.8	0.5
POR016	29.3	38.1	38.6	0.5
OPOR016	29.6	38.4	38.9	0.5
POR020	25.2	35.5	35.9	0.4
OPOR020	24.6	34.1	34.6	0.5
POR037	29	39.5	39.9	0.4
OPOR037	29.4	40.0	40.4	0.4
POR044	28.4	38.5	38.9	0.4
OPOR044	28.1	38.1	38.5	0.4
POR061	27.2	39.5	39.7	0.2
OPOR061	26.8	38.9	39.2	0.3

(a) - Noise levels based on fully implemented Noise Abatement Action Plan (NAAP)

MECP Landfill Guidance Significance of Noise Level Increase

Sound Level Increase (dB)	Qualitative Rating
1 to 3 inclusive	Insignificant
3 to 5 inclusive	Noticeable
5 to 10 inclusive	Significant
10 and over	Very significant

General Consideration:
Change of <3 dB is often not noticeable

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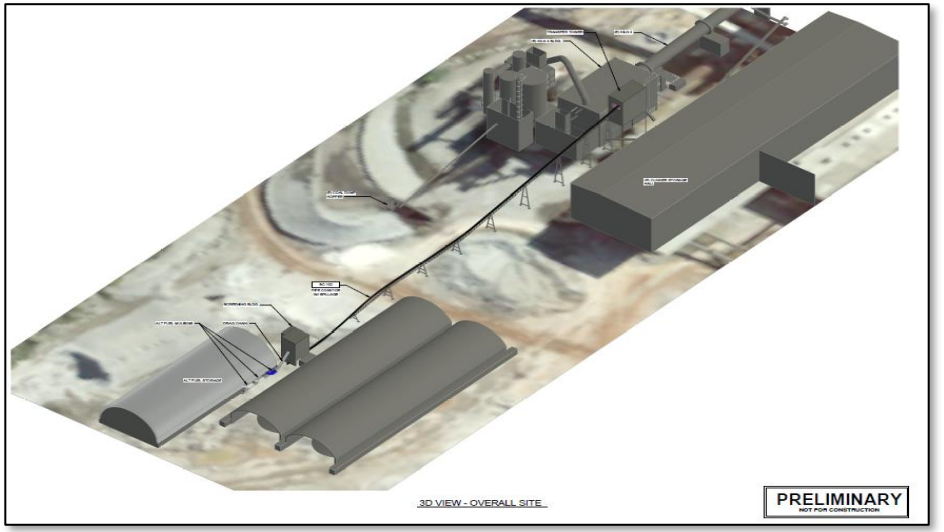
Additional Study Consideration – Archaeology / Cultural Heritage

- The ALCFs project footprint is small in relation to the Facility size and will not result in undisturbed ground being affected.
- The storage facility will be confined to an area within the plant operating boundary and in close proximity to the kiln system.
- The Project Team has engaged the Ministry of Tourism, Culture and Sport (MTCS) as an Archaeological Assessment / Cultural Heritage Assessment is not anticipated to be required due to the size of the addition on previously disturbed areas of the Facility.



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Additional Study Considerations – Traffic Impact

Traffic Impact Assumptions:

- Anticipated 6-12 daily trucks associated with transporting ALCF at maximum operating potential; majority arriving and departing from site between Monday and Friday.
- While the incremental daily truck travel demand will be generated by the site between 7:00 a.m. and 7:00 pm., we understand that the peak arrival and departure period will typically lie between 9:00 a.m. and 3:00 p.m. during which approx. 75% of the incremental truck arrivals and departures will be expected. (1 truck / hr)
- None of the incremental truck travel demand is expected to approach from or depart towards the west (through Picton) and that all trucks will approach from and depart towards Highway 401.

Findings:

- Based on the magnitude and temporal distribution of the incremental truck traffic generated as a result of the approval of the ALCF permit, the incremental travel demand will not have noticeable traffic impacts at local intersections nor along Highway 49 between the plant driveway at 1370 Highway 49 and Highway 401 interchange.

Next Steps for the Project

- Following Public Meeting #2, a **Consultation Report** that outlines a description of all consultation activities undertaken as part of the Amendment ECA Application will be prepared.
- Once the Consultation Report is completed, a **Notice of Completion of the Consultation Report** will be issued and the Consultation Report will be made available on the Project website for public review.
- The **ECA Application** will include the technical studies discussed at this meeting and will be posted on the Project website prior to the target submission date of **October 2022**.

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We want to hear from you!

How can you participate in this project?

- Provide comments directly via email at: LehighPictonALCF@golder.com
- The Project Team is requesting comments by **September 15th, 2022**.
- Visit our Project website at www.LehighPictonALCF.ca where all notices and presentation materials will be made available

Nick Papanicolaou
Lehigh Hanson Materials Limited, Picton Plant Environmental Manager, Canada

Nadia Dabagh
WSP Golder
Consultation Lead, Environmental Planner

Jamie McEvoy
WSP Golder
Project Manager, Senior Air Quality Engineer

Lehigh Hanson
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