ENVIRONMENTAL COMPLIANCE APPROVAL (ECA) APPLICATION

FOR

BIRD CONSTRUCTION INDUSTRIAL SERVICES LTD.

SUBMITTED TO:

Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. West, 1st Floor
Toronto, Ontario, M4V 1P5

SUBMITTED BY:

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SE #: 1185.001

February 22, 2023

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EXECUTIVE SUMMARY

Bird Construction Industrial Services Ltd. (Bird) is proposing to construct a ready-mix portable concrete batching facility located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River.

The purpose of this application is to obtain an Environmental Compliance Approval with Limited Operational Flexibility (LOF) and to assess the facility's compliance with O. Reg 419/05.

Bird's operations will be covered under NAICS code 327320 – Ready-Mix Concrete Manufacturing. Bird will be producing ready-mix concrete for its clients by means of mixing aggregates, sand, cement, cement supplements, admixtures, and water. The activities at the facility will include transfer of materials to stockpiles, bins, conveyor, elevated scale, mixer, trucks, and storage silos. Potential emissions will include particulate matter and metals and by-products of combustion.

The maximum production capacity for the facility will be 800 m^3/day.

The ESDM Report was prepared in accordance with s.25 & s.26 of Ontario Regulation 419/05 (O. Reg 419/05), as well as following guidance from the Ministry of Environment, Conservation and Parks (MECP) publication *"Procedure for Preparing an Emission Summary and Dispersion Modelling Report"*, dated March 2018, as appropriate.

U.S. EPA's AERMOD dispersion model was used to predict concentration at points of impingement (POI). The maximum predicted concentrations for all contaminants were compared against their Schedule 3 limits, and all POI concentrations were found to be below their respective standard or guideline value. As such, the ESDM report demonstrated that the Bird facility can operate in compliance with the requirements of O. Reg 419/05.

The Acoustic Assessment Report (AAR) was prepared by Freefield Ltd.

APPLICATION PACKAGE LAYOUT

Section 1	Application Form
Section 1A	Confidentiality Rationale
Section 1B	Verification of Legal Name
Section 1C	Scaled Area Location Plan
Section 1D	Environmental Bill of Rights (EBR) Posting
Section 1E	Landlord Authorization Letter
Section 1F	Pre-consultation Record
Section 2	Emission Summary and Dispersion Modelling (ESDM) Report
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SONAIR
ENVIRONMENTAL

SECTION 1

APPLICATION FORM

Ontario

Ministry of the Environment, Conservation and Parks

Environmental Compliance Approval Application

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Disponible en français

Ontario

Ministry of the Environment, Conservation and Parks

Environmental Compliance Approval Application

General Information and Instructions

General Information

Information requested in this form is collected under the authority of the *Environmental Protection Act* (EPA), *Ontario Water Resources Act* (OWRA) and Environmental Bill of Rights (EBR), and will be used to evaluate applications for Environmental Compliance Approvals (ECAs) issued under Part II.1 of the EPA. This application form should not be used for mobile PCB destruction facilities.

For all questions related to preparing or submitting this form or about the Ministry's collection of information related to applying for an ECA, contact:

Client Services and Permissions Branch
135 St. Clair Ave. West, 1st Floor
Toronto Ontario M4V 1P5
Telephone outside Toronto 1-800-461-6290 or in Toronto 416-314-8001.

The Ministry offers environmental permissions services online, and we strongly encourage online submissions for ECA applications. You can apply, track application progress and complete payments online. For more information on setting up an account so that you can apply online please visit: https://www.ontario.ca/page/environmental-compliance-approval

Instructions for submitting your ECA application:

1. Applicants are responsible for ensuring that they complete the most recent application form (available in PDF format) available at https://www.ontario.ca/page/environmental-compliance-approval. For information about required supporting documentation and technical requirements, you may contact the Client Services and Permissions Branch (the address and phone number are provided in the General Information on this page). As well, you can get this information from your local District Office of the Ministry of the Environment, Conservation and Parks, and online at the link above.
2. A complete application consists of:
   - a completed and signed application form;
   - all required supporting documents and technical requirements identified in:
     i. this form,
     ii. Ministry guidance, the Applications for Environmental Compliance Approvals regulation (Ontario Regulation 255/11),
     iii. and payment of the application fee (in Canadian funds) by certified cheque or money order made payable to the Minister of Finance, or credit card payment (for payments up to $10,000).

     The Ministry may return or refuse incomplete applications to the applicant. The Director may require additional information of any application initially accepted as complete.
3. How to submit:
   - No payment required – email the application form and supporting documents to ECA.Submission@ontario.ca
   - Payment required – see Section 8 for instructions

   Do not mail a paper copy of the application submission to our branch
4. For Waste Disposal Sites the applicant must also send a copy of the application without the fee to the Clerk's office of the local municipality (both upper and lower tier) in which the facility/proposed facility is located unless the application is for a revocation or an amendment that is environmentally insignificant or the applicant is a municipality. **Do not** send any payment information to the municipality.

Information contained in this application form (excluding Section 8, payment information) is not considered confidential and will be made available to the public upon request. Information submitted as supporting information may be claimed as confidential under Section 6.10 of this application form but will be subject to the *Freedom of Information and Protection of Privacy Act* (FIPPA) and the *Environmental Bill of Rights* (EBR). If you do not claim confidentiality at the time of submitting the information, the Ministry may make the information available to the public without further notice to the applicant.

It is an offence under the EPA and OWRA to provide false or misleading information in this application and/or accompanying documents.

Complete the sections as shown below.

- Section 1: Applicant Information
- Section 2: Project Information
- Section 3: Regulatory Requirements
- Section 4: Site Information
- Section 5: Facility Information
- Section 6: Supporting Documentation and Technical Requirements
- Section 7: Authorization
- Section 8: Payment Information

Fields marked with an asterisk (*) are mandatory.

1. Applicant Information

1.1 Applicant Information

Applicant Type *

☑ Corporation ☐ Individual ☐ Federal Government ☐ Municipal Government

☐ Partnership ☐ Provincial Government ☐ Sole Proprietor

☐ Other (specify)

Applicant Name (Legal name of individual or organization as evidenced by legal documents) *

Bird Construction Industrial Services Ltd.

☑ Select if Business Name same as Applicant Name

Business Name *

Bird Construction Industrial Services Ltd.

Business Number *	Business Website Address
755603297	https://www.bird.ca/

Primary North American Industry Classification System (NAICS) Code *

327320

Other NAICS Code

Separate list attached?

☐ Yes ☑ No

Business Activity Description

ready-mix portable concrete batching plant

✓ Completion Status (1.1 Applicant Information)

1.2 Applicant Physical Address

Address Type? *

☑ Civic Address ☐ Survey Address

Civic Address

Unit Number	Street Number *	Street Name *
400	5700	Explorer Drive

Survey Address

Enter Lot and Concession or Part and Reference Plan

Lot	Concession	Part	Reference Plan

Municipality/Unorganized Township *		County/District		
Mississauga				
Province/State *		Country *		Postal/Zip Code *
Ontario		Canada		L4W 0C6
Telephone Number *	Fax Number	Mobile Number	Email Address *	
780-799-9961 ext.			nathan.downie@bird.ca	

Geo Reference

Description of location	Map Datum	Zone	Accuracy Estimate	Geo-Referencing Method	UTM Easting	UTM Northing
Southwest corner of property	NAD83	17	+/-5m	Google Earth	611,828.33	4,834,744.31
Physical location of front door or main entrance	NAD83	17	+/-5m	Google Earth	611,827.09	4,834,819.91

✓ Completion Status (1.2 Applicant Physical Address)

1.3 Applicant Mailing Address

☑ Select if same as Physical Address

Unit Number	Street Number *	Street Name *		
400	5700	Explorer Drive		
Delivery Designator		Delivery Identifier	Postal Station	

Municipality/Unorganized Township *		County/District		
Mississauga				
Province/State *		Country *		Postal/Zip Code *
Ontario		Canada		L4W 0C6
Telephone Number *	Fax Number	Mobile Number	Email Address *	
780-799-9961 ext.			nathan.downie@bird.ca	

✓ Completion Status (1.3 Applicant Mailing Address)

Fields marked with an asterisk (*) are mandatory.

2. Project Information

2.1 Project Name and Description

Project Name *

SE1185.001

Project Description Executive Summary *

Bird Construction Industrial Services Ltd. (Bird) is proposing to construct a ready-mix portable concrete batching facility located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River.

The purpose of this application is to obtain an Environmental Compliance Approval with Limited Operational Flexibility (LOF) and to assess the facility's compliance with O. Reg 419/05.

Bird's operations will be covered under NAICS code 327320 – Ready-Mix Concrete Manufacturing. Bird will be producing ready-mix concrete for its clients by means of mixing aggregates, sand, cement, cement supplements, admixtures, and water. The activities at the facility will include transfer of materials to stockpiles, bins, conveyor, elevated scale, mixer, trucks, and storage silos. Potential emissions will include particulate matter and metals and by-products of combustion.

The maximum production capacity for the facility will be 800 m3/day.

The facility is expected to operate twenty-four (24) hours per day, five (5) days per week, with occasional weekends, if required. The facility will be operating 12 hours per day during the daytime hours at full capacity, and at 30% capacity at nighttime as required.

Supplemental Application Information (select information button for required information for this field) *

The plant is anticipated to start operation as soon as the applicant receives an Environmental Compliance Approval.

Hard copies are no longer required; therefore, hard copies were not sent to the approvals branch nor the local district office.

✓ Completion Status (2.1 Project Name and Description)

2.2 Application Type

Type *

- ☑ New ECA
- ☐ Technical Amendment to existing ECA (including extending the cessation or expiry date of an existing ECA that is not expired)
- ☐ Revocation of existing ECA
- ☐ Administrative amendment to existing ECA
- ☐ Application for renewal of operational flexibility or limited operational flexibility
- ☐ Consolidation of existing ECAs

Is this application for the addition of a new project type to the site or a new municipal waste category/class code to the waste management systems or a new sewage facility type?

☐ Yes ☐ No

Is this application for Transfer of Review? *

☐ Yes ☑ No

✓ Completion Status (2.2 Application Type)

2.3 Project Type

Project Type (Select all that apply) *	Operational Flexibility?	Pilot Project?
☑ Air - Stationary	☑	☐
☐ Air - Mobile	☐	☐
☑ Noise	☑	☐
☐ Vibration	☐	☐
☐ Waste Disposal Site - Landfill site	N/A	☐
☐ Waste Disposal Site - Transfer site	☐	☐
☐ Waste Disposal Site - Processing site	☐	☐
☐ Waste Disposal Site - Composting site	☐	☐
☐ Waste Disposal Site - Thermal Treatment site	☐	☐
☐ Waste Disposal Site - Hauled Sewage Disposal Site	N/A	☐
☐ Waste Disposal Site - Processed Organic Waste (Biosolids) Land Application Site	N/A	☐
☐ Sewage - Industrial	☐	☐
☐ Sewage - Municipal	☐	☐
☐ Sewage - Private	☐	☐
☐ Waste Management System - General Waste Management System	N/A	☐
☐ Waste Management System - Hauled Sewage (Septage)	N/A	☐
☐ Waste Management System - Processed Organic Waste for transport to an agricultural or non-agricultural site for storage or land application	N/A	☐
☐ Waste Management System - Mobile Waste Processing	N/A	☐
☐ Cleanup of contaminated sites - Mobile	N/A	☐
☐ Cleanup of contaminated sites - Site specific	N/A	☐

✓ Completion Status (2.3 Project Type)

2.4 Approval Information

Reason for Application / Application initiated by *

☑ Applicant
☐ Condition of existing approval
☐ Inspection Report (attach copy)
☐ ECA Review Notice from Director (EPA s20.4)
☐ S. 20.18 Order (attach copy)
☐ Provincial Officer Order (attach copy)
☐ Extend the cessation date or expiry date of an existing ECA
☐ ECA Review Required by Regulation (EPA s20.4)
☐ Other (specify) _____

Current Environmental Compliance Approvals that may be changed or amended by this application: ☑ N/A

Environmental Compliance Approval Number	Date of Issuance (yyyy/mm/dd)	Cessation/Expiry Date (yyyy/mm/dd)

Separate list attached?

☐ Yes ☐ No

Other proposed Environmental Compliance Approvals related to this project: ☑ N/A

Project Type	Ministry Reference Number (if applicable)	Have Submitted	Have not Submitted
		☐	☐

Separate list attached?

☐ Yes ☐ No

✓ Completion Status (2.4 Approval Information)

2.5 Other Approval/Permits for Facility

List all other instruments (approvals or permits) issued by the Ministry of the Environment, Conservation and Parks or applied for under the *Environmental Protection Act*, *Environmental Assessment Act*, *Ontario Water Resources Act* and *Safe Drinking Water Act, 2002* and any Environmental Activity and Sector Registrations that are relevant to this application. ☑ N/A

Instrument Type	Instrument Number/ Application Reference Number	Approval or Application Date (yyyy/mm/dd)	Cessation/Expiry Date (yyyy/mm/dd)

Separate list attached?

☐ Yes ☐ No

List all other instruments (approvals or permits) issued by an agency, municipality or another ministry that are relevant to this application. ☑ N/A

Issuing Agency	Approval or Permit Name	Approval or Permit Number	Issued Date (yyyy/mm/dd)

Separate list attached?

☐ Yes ☐ No

✓ Completion Status (2.5 Other Approval/Permits for Facility)

2.6 Technical Contacts

Technical Contact 1

Area of Responsibility (Select all that apply) *

☑ Air ☐ Noise/Vibration ☐ Sewage ☐ Waste

Name of Technical Contact

Last Name *	First Name *
Li	Thomas

Company *
SONAIR Environmental Inc.

Address Information

☐ Select if same as Applicant Mailing Address

Civic Address

Unit Number	Street Number *	Street Name *
	-	PO Box 56702 Pine Valley

Delivery Designator	Delivery Identifier	Postal Station

Municipality/Unorganized Township *	County/District	
Vaughan		
Province/State *	**Country ***	**Postal/Zip Code ***
Ontario	Canada	L4L 8V3

Telephone Number *	Fax Number	Mobile Number	Email Address *
905-920-3060 ext.			tli@sonairenviro.com

Technical Contact 2

Area of Responsibility (Select all that apply) *

☐ Air ☑ Noise/Vibration ☐ Sewage ☐ Waste

Name of Technical Contact

Last Name *	First Name *
Wells	Michael

Company *
Freefield Ltd.

Address Information

☐ Select if same as Applicant Mailing Address

Civic Address

Unit Number	Street Number *	Street Name *
	-	PO Box 74056 RPO Beechwood

Delivery Designator	Delivery Identifier	Postal Station

Municipality/Unorganized Township *	County/District	
Ottawa		
Province/State *	**Country ***	**Postal/Zip Code ***
Ontario	Canada	K1M 2H9

Telephone Number *	Fax Number	Mobile Number	Email Address *
613-747-0983 ext.			michael@freefieldacoustics.com

✓ Completion Status (2.6 Technical Contacts)

Fields marked with an asterisk (*) are mandatory.

3. Regulatory Requirements

3.1 Environmental Bill of Rights (EBR) Requirements

Is this an application for a classified instrument identified in Section 5 of O. Reg. 681/94, under the Environmental Bill of Rights, 1993 (EBR)? *

☐ Yes ☑ No

If yes, an exception to the requirement to post a proposal notice on the Environmental Registry may apply. These exceptions are set out in the EBR. If you believe an exception may apply to your proposal, please identify which circumstance may be applicable and provide the appropriate supporting information. The information you provide is for background purposes; the Ministry will evaluate the information and determine whether an exception does in fact apply.

☐ This proposal has been considered in a substantially equivalent process of public participation. (EBR, 1993, s.30.). Please provide a description of any processes of public participation that you engaged in, that were substantially equivalent to the process required under the EBR, in respect of the environmentally significant aspects of the ECA application, including:

- The type of public participation
- How, where and when the process of public participation was conducted
- The number of participants
- The type of comments received
- Actions you took as a result of the comments
- Whether ministry staff were involved in the process

Please also include documentation verifying the process of public participation.

Was the public participation process carried out in fulfillment of the requirements related to an approval under the *Planning Act*?

☐ Yes ☐ No

If yes, was the *Planning Act* approval related to a plan of subdivision?

☐ Yes ☐ No

☐ This proposal is for an emergency situation. (EBR, 1993, s. 29.). Please provide details about why a delay that would result from posting a proposal for the ECA on the Environmental Registry would result in (a) danger to the health or safety of any person; (b) harm or serious risk of harm to the environment; or (c) injury or damage or serious risk of injury or damage to any property

☐ This proposal is for an amendment to or revocation of an existing Environmental Compliance Approval that is not environmentally significant. (EBR, 1993, s. 22 (3).) Please provide details about why the effect of the amendment or revocation on the environment is insignificant.

☐ This proposal has been subject to or exempted from Environmental Assessment Act (EAA) Requirements or considered in a decision of a tribunal. (EBR, 1993, s. 32.) Please provide a description of why the ECA would be a step toward implementing an undertaking or other project that is (a) subject to, or exempted from, a decision made under the EAA; or (b) approved by a decision made by a tribunal after affording an opportunity for public participation.

☐ Check here if you do not believe any of the above circumstances apply to your proposal.

✓ Completion Status (3.1 Environmental Bill of Rights (EBR) Requirements)

3.2 *Environmental Assessment Act* (EAA) Requirements

Is the proposed undertaking subject to the requirements of the EAA? *

☐ Yes ☑ No

If yes, please select one of the following:

☐ The proposed undertaking has fulfilled the requirements of the EAA through the completion of a Class EA process

Name of Class EA _____

Schedule/Group/Category (if applicable) _____

If applicable, please submit a copy of the proof of completion (for example, Notice of Completion).

Was a section 16 order (previously named a Part II Order), under the EAA requested, considered (e.g. Notice of Proposed Order) and/or made on/for the undertaking?

☐ Yes ☐ No

If yes, please submit a copy of the relevant documentation.

☐ The proposed undertaking has fulfilled all of the requirements for the EAA through:

Select all that apply:

☐ completion of an Environmental Screening Process pursuant to O. Reg. 101/07 of the EAA

☐ completion of an Environmental Screening Process pursuant to O. Reg. 116/01 of the EAA

Was the undertaking subject of an elevation request(s)?

☐ Yes ☐ No

If yes, please submit a copy of the Director's decision letter. If an appeal was made to the Director's decision, please also submit a copy of the Minister's decision letter.

☐ completion of an Environmental Screening Process pursuant to O. Reg. 231/08 of the EAA

Was the undertaking subject of an objection(s)?

☐ Yes ☐ No

If yes, please submit a copy of the Minister's decision letter.

☐ The proposed undertaking has fulfilled the requirements of the EAA through the completion of an individual Environmental Assessment.
Please submit a copy of the signed Notice of Approval.

Was the undertaking exempted from the requirements of the EAA?

☐ Yes ☐ No

The proposed undertaking has fulfilled the requirements of the EAA through an exemption provided under:

Select one of the following

☐ Section _____ of Ontario Regulation No. _____ or

☐ Declaration/Exemption Order Number _____

If Regulation, Declaration Order or Exemption Order does not refer directly to this undertaking, please provide supporting documentation to explain why it applies to this facility

✓ Completion Status (3.2 *Environmental Assessment Act* (EAA) Requirements)

3.3 Consultation/Notification

Indigenous Consultation:

Is the proposed project/activity on Crown land or does/would it alter access to Crown land? *	☐ Yes ☑ No
Is the proposed project/activity in an open or forested area where hunting, trapping or plant gathering could occur? *	☐ Yes ☑ No
Does the proposed project/activity involve the clearing of forested land? *	☐ Yes ☑ No
Could the proposed project/activity impact a water body (e.g., direct discharge) or alter access to a water body? *	☐ Yes ☑ No

Could the proposed project/activity impact cultural heritage or archaeological resources, or access to them? * ☐ Yes ☑ No

Is the proposed project/activity adjacent or close to a First Nation Reserve? * ☐ Yes ☑ No

Is the applicant aware of any concerns from Indigenous communities about this proposed project/activity? * ☐ Yes ☑ No

Were there conditions placed, or direction provided, in another (or previous) permit or approval for consultation in relation to this project/activity? * ☐ Yes ☑ No

Based on the online Guide to Applying for an Environmental Compliance Approval, or direction provided by the Ministry or another agency, are Indigenous consultation activities likely required as part of this application process? * ☐ Yes ☑ No

If Yes to the question above, please describe the consultation/notification activities undertaken for this application or as part of another process (e.g., EAA) in relation to the proposed project/activity, including a summary of the notification/ consultation, First Nation and Métis communities contacted, key issues raised and how they were addressed, any changes to the project as a result of these activities, and any planned consultation/notification activities in the future.

Please attach supporting documents (e.g., record of consultation, delegation letter and/or direction provided by the Crown, materials provided to communities, meeting notes and agendas, correspondence with communities as appropriate).

If the applicant has determined that consultation with First Nation and Métis communities is not likely required for the proposed project/activity, please provide a rationale why: *

It is not anticipated that First Nation and Metis communities will be impacted.

Other Consultation/Notification: Show Information

Has the applicant had a ministry pre-application consultation in relation to the proposed project? *

☑ Yes ☐ No

If this application is for a waste disposal site (including for a Hauled Sewage Disposal Site), have the neighbour notification requirements been completed?

☐ Yes ☐ No

If yes, please attach a Public Consultation/Notification Report that includes the notice and list of recipients.

If no, please select the reason for not undertaking neighbour notification:

☐ Application is for an administrative amendment

☐ other , please explain

Are there any other consultation/notification activities that have been undertaken to fulfill requirements by other legislation or through voluntary efforts? *

☐ Yes ☑ No

If yes, please:

1. describe the consultation/notification activities below; and
2. attach documents describing each of these consultation\notification activities, any changes to the project as a result of these activities and any planned consultation/notification activities in the future.

✓ Completion Status (3.3 Consultation/Notification)

Fields marked with an asterisk (*) are mandatory.

4. Site Information

4.1 Site Address or Storage Location

Will the vehicles or equipment be stored at more than one location?

☐ Yes ☐ No

(If yes, please enter all vehicle or equipment storage locations below and attach separate list, as necessary.)

☐ Select if same as Applicant Physical Address

Address Type? *

☐ Civic Address ☑ Survey Address

Primary Civic Address

Unit Number	Street Number	Street Name

Additional Civic Addresses

Unit Number	Street Number	Street Name

Separate list attached?

☐ Yes ☐ No

Primary Survey Address

Enter Lot and Concession or Part and Reference Plan *

Lot *	Concession *	Part	Reference Plan
4	7 & 8		

Additional Survey Address

Enter Lot and Concession or Part and Reference Plan

Lot	Concession	Part	Reference Plan
3	8		

Separate list attached?

☐ Yes ☐ No

Municipality/Unorganized Township *	County/District	
Township of Buchanan		
Province/State *	**Country ***	**Postal/Zip Code ***
Ontario	Canada	-

Non-address Information (includes any additional information to clarify the physical location)

Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River

Geo Reference (required)

☐ Select if same as Applicant Physical Geo Reference

Description of location	Map Datum *	Zone *	Accuracy Estimate *	Geo-Referencing Method *	UTM Easting *	UTM Northing *
Southwest corner of property	NAD83	18	+/-5m	Google Earth	311,287.96	5,098,138.67
Physical location of front door or main entrance	NAD83	18	+/-5m	Google Earth	310,694.65	5,099,089.89

✓ Completion Status (4.1 Site Address or Storage Location)

4.2 Site or Storage Location Information

Site Name *

Bird Construction Industrial Services Ltd.

Days and Hours of Operation *	Ministry of the Environment District Office *
24/7 - Mon - Fri. Occasional Weekends, if required	Ottawa District Office

Is the site (property) that is the subject of this application owned by the applicant? *

☐ Yes ☑ No

If no, please include the owner's name, address and a signed document indicating that the applicant has the authority to install and operate the proposed activity, or store vehicles or equipment on the land.

Is the applicant the operating authority of the site that is the subject of this application? *

☑ Yes ☐ No

If no, please include the operating authority name, address and phone number.

Is the site located in an area of development control as defined by the *Niagara Escarpment Planning and Development Act* (NEPDA)? *

☐ Yes ☑ No

If yes, please attach a copy of the NEPDA permit for proposed activity.

Is the site within an area covered by the Oak Ridges Moraine Conservation Plan? *

☐ Yes ☑ No

If yes, please attach proof of municipal planning approval for the proposed activity/work (for example, zoning by-law, letter from municipality, etc.).

✓ Completion Status (4.2 Site or Storage Location Information)

4.3 Site Zoning and Classification ☐ N/A

Current Land Use *	Official Plan Designation *	Current Zoning (Please attach zoning map, if available.) *
Vacant	Village Community	RU/HC

Adjacent Land Use (select all that apply) *

☑ Industrial ☐ Agricultural ☑ Commercial ☐ Recreational ☑ Residential

☐ Other (specify) _____

Adjacent Land Zoning *

General Industrial, Commercial, Residential Urban

Does the current zoning permit the proposed activity? *

☑ Yes ☐ No

Does the applicant have correspondence from the municipality to confirm that the current zoning of the property permits the proposed use? *

☐ Yes ☑ No If yes, please attach correspondence from the municipality.

Does the official plan designation support the proposed activity? *

☑ Yes ☐ No

✓ Completion Status (4.3 Site Zoning and Classification)

4.4 Point of Entry into Ontario ☐ N/A

(for waste management system vehicles that are stored at an address outside of Ontario)

City in closest proximity to the point of entry

Description of Point of Entry

✓ Completion Status (4.4 Point of Entry into Ontario)

4.5 Source Protection/Drinking Water Threats (sewage or waste disposal site applications only) ☐ N/A

Check the source protection area(s) where the activity is/will be located

☐ Ausable Bayfield	☐ Cataraqui Region	☐ Catfish Creek
☐ Central Lake Ontario	☐ Credit Valley	☐ Crowe Valley
☐ Essex	☐ Ganaraska	☐ Grand River
☐ Grey Sauble	☐ Halton	☐ Hamilton
☐ Kawartha-Haliburton	☐ Kettle Creek	☐ Long Point
☐ Lakehead	☐ Lake Simcoe and Couchiching/Black River	☐ Lower Trent
☐ Lower Thames Valley	☐ Maitland Valley	☐ Mattagami
☐ Mississippi Valley	☐ Niagara	☐ North Bay Mattawa
☐ Northern Bruce Peninsula	☐ Nottawasaga Valley	☐ Rideau Valley
☐ Raisin Region	☐ South Nation	☐ Saugeen Valley
☐ Sault Ste. Marie	☐ Severn Sound	☐ Sudbury
☐ St. Clair Region	☐ Toronto and Region	☐ Otonabee-Peterborough
☐ Outside a source protection area	☐ Quinte	☐ Upper Thames River

Is the proposed activity located or planned to be located in a vulnerable area identified in a local assessment report source protection plan under the *Clean Water Act, 2006*?

☐ Yes ☐ No

If yes, what is/are the vulnerable area(s)/zone(s)?

☐ Wellhead Protection Areas ☐ Surface Water Intake Protection Zones ☐ Highly Vulnerable Aquifers

☐ Significant Groundwater Recharge Areas ☐ Issue Contributing Areas

Is the activity being applied for identified as a significant drinking water threat in the assessment report for the local source protection area?

☐ Yes ☐ No

✓ Completion Status (4.5 Source Protection/Drinking Water Threats)

4.6 Receiver of Effluent Discharge (sewage applications only) ☐ N/A

Intermediate Receiver Name

Watershed Name

Type of Receiver

☐ Surface Water ☐ Groundwater ☐ Other (specify) _____

Has the facility received local Conservation Authority clearance? (for stormwater management facility discharging to the natural environment)

☐ Yes ☐ No

If yes, please include a copy of the Conservation Authority clearance.

Final Receivers ☐ N/A

If the proposed activity will discharge sewage to any of the following critical receivers, please identify the receiver(s):

☐ Lake Simcoe ☐ Rideau River ☐ Detroit River

☐ Great Lakes ☐ Rouge River ☐ Bay of Quinte

☐ Other (specify) _____

Is the receiver a Policy 2 receiver?

☐ Yes ☐ No

Does the applicant have a Policy 2 deviation approval from the directors?

☐ Yes ☐ No

If yes, please attach a copy of the Director's approval.

✓ Completion Status (4.6 Receiver of Effluent Discharge)

4.7 Site Physical and Distance Parameters (Hauled Sewage Disposal Site and Processed Organic Waste Land Application Site applications only) ☐ N/A

Total Site Area (hectares)	Total Usable Area (hectares)

Soil T-Time

What is the estimated soil T-time within the usable area of the site based on field percolation tests or equivalent method? (e.g. grain size analyses). Use the check boxes below for your answer (more than one box can be checked) and provide a copy of the soil evaluation/analysis along with this application.

☐ T-time < 1 minute per cm ☐ T-time > 1 minute per cm and < 50 minutes per cm ☐ T-time > 50 minutes per cm

Soil Permeability

Provide an estimate of the soil permeability within the usable area of the site based on field percolation tests or equivalent method (e.g. grain size analyses). Use the check boxes below for your answer (more than one box can be checked) and provide a copy of the soil evaluation/ analysis along with this application.

☐ Slow ☐ Moderate ☐ Moderately Rapid ☐ Rapid

Average Slope

Provide an estimate of the slope of the land within the usable area of the site. Use the check boxes below for your answer (more than one box can be checked).

☐ 0-3% (Flat) ☐ 3-6% (Gentle Slope) ☐ 6-9% (Moderate Slope) ☐ >9% (Steep Slope)

Is the land within the usable area tile drained?

☐ Yes ☐ No

Distance to Sensitive Features

Please identify whether the distance from the edge of any portion of the site where hauled sewage or processed organic waste will be spread/stored or where hauled sewage will otherwise be deposited (e.g. in a dewatering trench, lagoon, storage) or land applied is:

Within 30 metres of the closest public roadway?

☐ Yes ☐ No

Within 200 metres of the closest surface water body?

☐ Yes ☐ No

Within 90 metres of the closest house on-site?

☐ Yes ☐ No ☐ N/A

Within 90 metres of the closest house off-site?

☐ Yes ☐ No

Within 450 metres of the closest residential area (i.e. cluster of 3 or more houses)?

☐ Yes ☐ No

Within 450 metres of the closest commercial, recreational or institutional use, and locations at which people regularly congregate?

☐ Yes ☐ No

Distance to Local Treatment Facilities

Is there a private or municipal sewage treatment plant that accepts hauled sewage located within 50km of this site?

☐ Yes ☐ No ☐ N/A

Is there any other type of private or municipal facility (e.g. biodigester) that accepts and treats hauled sewage located within 50km of this site?

☐ Yes ☐ No ☐ N/A

✓ Completion Status (4.7 Site Physical and Distance Parameters)

Fields marked with an asterisk (*) are mandatory.

5. Facility Information

5.1 Air Show Information

5.1.1 Summary of Equipment that Discharges Contaminants to the Air

Select Type of Equipment *	Number of Pieces of Equipment *
☑ Combustion equipment that uses natural gas, propane, no. 2 oil, landfill gas or sewage treatment gas for fuel for the purpose of providing comfort heating or emergency power, producing hot water or steam, or heating material in a system that does not discharge to the atmosphere (Total Heat input of all units: ≤ 50,000,000 kJ/hr)	1
☐ Storage tanks	N/A
☐ Welding operations that use a maximum of 10 kilograms of welding rod per hour	N/A
☐ Combustion equipment that uses waste-derived fuel for the purpose of providing comfort heating, burning ≤ 15 litres per hour	
☐ Heat cleaning ovens used for parts cleaning and associated parts washers or degreasing equipment, other than solvent degreasing equipment	
☐ Cooling towers	
☑ Equipment used to control emissions of contaminants, other than a fume incinerator	4
☐ Laboratory fume hoods	
☐ Paint spray booths and associated equipment that have a design capacity of up to 8 litres per hour of paint	
☐ Grain dryers	
☑ Any other equipment not listed above with a flow rate of less than or equal to 1.5 m^3/second	4
☐ Any other equipment not listed above with a flow rate of greater than 1.5 m^3/second	
☐ Equipment that is subject to an Environmental Compliance Approval, and from which there is no proposed increase in the discharge of any contaminant that was previously reviewed by the Director.	N/A

✓ Completion Status (5.1.1 Summary of Equipment that Discharges Contaminants to the Air)

5.1.2 Emission Summary and Dispersion Modelling (ESDM) Report

Is the review of an existing, approved ESDM required as part of this proposed application? *

☐ Yes ☑ No

If yes, identify the number of emission sources described in the existing ESDM Report that emit contaminants in common with the sources forming the subject of the application (if none, enter zero).

Have all of these emission sources been described in an ESDM Report that was previously reviewed as part of an application for an existing Environmental Compliance Approval? *

☐ Yes ☑ No

✓ Completion Status (5.1.2 ESDM Report)

5.1.3 O. Reg. 419/05 Requirements

Does s. 20 (Schedule 3) of O. Reg. 419/05 apply to the facility? *

☑ Yes

☐ Does not apply. Please indicate reason _____

Has an instrument under O. Reg. 419/05 been issued? *

☐ Yes ☑ No

If yes, what type(s) of instruments (including any notices, orders or approvals) has (have) been issued? (select all that apply)

- ☐ ss. 4(2) Adjacent Properties
- ☐ ss. 7(1) Specified Dispersion Models
- ☐ ss. 8(2) Negligible Sources
- ☐ ss. 10(2) Operating Conditions
- ☐ ss. 11(2) Refined Emission Rates
- ☐ ss. 13.1 Value of Dispersion Modeling Parameters
- ☐ ss. 13(1) Meteorological Data
- ☐ ss. 14(6) Area of Modelling Coverage
- ☐ ss. 20(4) Speed-up Request
- ☐ ss. 20(5) Speed-up Order
- ☐ s. 35 Site-specific Standard
- ☐ ss. 35(14) Site-specific Standard Order
- ☐ ss. 39(3) Technical Standard Registration (Industry Standard)
- ☐ ss. 39(4) Technical Standard Registration (Equipment Standard)
- ☐ Other (list all that have been issued) _____

Is an instrument under O. Reg. 419/05 being requested as part of this application? *

☐ Yes ☑ No

If yes, what type(s) of notice, order or approval is (are) being requested?

- ☐ ss. 7(1) Specified Dispersion Models
- ☐ ss. 8(2) Negligible Sources
- ☐ ss. 10(2) Operating Conditions
- ☐ ss. 11(2) Refined Emission Rates
- ☐ ss. 13(1) Meteorological Data
- ☐ ss. 14(6) Area of Modelling Coverage
- ☐ ss. 20(4) Speed-up Request
- ☐ s. 32 Request for a Site-specific Standard Order
- ☐ ss. 39(1)(a) Application for Technical Standard Registration (Industry Standard)
- ☐ ss. 39(1)(b) Application for Technical Standard Registration (Equipment Standard)
- ☐ Other (list all that have been issued) _____

Please attach the form(s) requesting the notice(s) and/or order(s) and any additional supporting information.

Has an s. 30 Upper Risk Threshold (Schedule 6) been exceeded? *

☐ Yes ☑ No

If yes, please include additional supporting information.

Is the facility located in a multi-tenant building? *

☐ Yes ☑ No

If yes, additional information may be requested.

Are all of the contaminants to which the application relates represented in the Ministry of the Environment, Conservation and Parks publication titled "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution - Local Air Quality" or have they been screened out based on the publication titled "Jurisdictional Screening Level (JSL) List - A Screening Tool for Ontario Regulation 419"? *

☑ Yes ☐ No

(If no, please attach Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S. 9).

✓ Completion Status (5.1.3 O. Reg. 419/05 Requirements)

✓ Completion Status (5.1 Air)

5.2 Noise

5.2.1 Noise Assessment

Show Information

Has an Acoustic Assessment Report (AAR) been completed in relation to the proposed project/activity? *

☑ Yes ☐ No

If yes, please attach the Acoustic Assessment Report

Does the AAR show that applicable limits are met? *

☑ Yes ☐ No

If no, please attach the Acoustic Assessment Report including the Noise Abatement Action Plan

If no, is the application eligible for Primary or Secondary Noise Screening?

☐ Yes ☐ No

Note that if the proposed activity is not eligible for either of the screenings, an AAR must be submitted.

If yes, is the proposed activity eligible for the Primary Noise Screening?

☐ Yes ☐ No

If yes, is the actual separation distance between the facility and the nearest noise sensitive point of reception (POR) greater than the minimum required separation distance calculated from the Primary Noise Screening?

☐ Yes ☐ No

If yes, please attach the Primary Noise Screening form and supporting documentation.
Note that if the Primary Noise Screening is not successful then the applicant may attempt to proceed with the Secondary Noise Screening.

If no, does the Secondary Noise Screening Form show that the applicable sound level limits are met?

☐ Yes ☐ No

If yes, please attach the Secondary Noise Screening Form and supporting documentation.
Note that if meeting the applicable sound level limits cannot be demonstrated, then an AAR must be submitted.

✓ Completion Status (5.2.1 Noise Assessment)

5.2.2 Equipment Subject to Noise Review

	Description *	Number of Pieces of Equipment *
☐	Arc Furnaces	
☐	Asphalt Plants	
☐	Blow-down Devices	
☐	Co-Generation Facilities	
☐	Crushing Operations	
☐	Flares	
☐	Gas Turbines	
☐	Pressure Blowers or Large Induced Draft Fans (flow rate > 47 m^3/second or static pressure > 1.25 kilopascals)	
☑	Any other equipment not listed above that has not previously been reviewed by the Director in connection with an application for an Environmental Compliance Approval with respect to the facility	12
☐	Any other equipment not listed above that is identical to equipment for which a noise assessment was previously reviewed by the Director in connection with an application for an Environmental Compliance Approval with respect to the facility	

✓ Completion Status (5.2.2 Equipment Subject to Noise Review)

✓ Completion Status (5.2 Noise)

5.3 Sewage Works Show Information

5.4 Waste Disposal Site (Including a Hauled Sewage Disposal Site or a Processed Organic Waste (Biosolids) Land Application Site)

5.5 Waste Management Systems (Except Mobile Waste Processing)

5.6 Waste Management System - Mobile Waste Processing

5.7 Cleanup of Contaminated Sites

6. Supporting Documentation and Technical Requirements

6.1 General

Note**: Information contained in this application form (excluding Section 8, payment information) is not considered confidential and will be made available to the public upon request. If the applicant is of the view that any part of the supporting information to this application is confidential on the grounds that such information constitutes a trade secret or scientific, technical, commercial, financial or labour relations information, please make this known in the table below by selecting the appropriate checkbox and providing the explanation for confidentiality in Section 6.10. The Ministry may request a redacted copy of this document for public viewing. Although the applicant may identify the supporting information as confidential, the information is subject to the FIPPA and EBR. If you do not claim confidentiality at the time of submitting the information (i.e. select the appropriate checkbox in the table below), the Ministry may make the information available to the public without further notice to the applicant.

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Proof of legal name	Required	☑ Yes ☐ No		☐
Enhanced EBR description	N/A	☐ Yes ☐ No		☐
Provincial Officer Notice	N/A	☐ Yes ☐ No		☐
Inspection Report	N/A	☐ Yes ☐ No		☐
Detailed project and process description	Required	☑ Yes ☐ No		☐
Pre-application Consultation Record	Required	☑ Yes ☐ No		☐
Legal Survey(s)	Optional	☐ Yes ☑ No	N/A	☐
Site Plan(s)	Required	☑ Yes ☐ No		☐
Scaled area location plan(s) with geo-referencing points identified	Required	☑ Yes ☐ No		☐
Documentation in support of EBR Exception	N/A	☐ Yes ☐ No		☐
Proof of Compliance with EAA Requirements	N/A	☐ Yes ☐ No		☐
Proof of Consultation/Notification	N/A	☐ Yes ☐ No		☐
Financial Assurance Estimate	Optional	☐ Yes ☑ No	N/A	☐
Name, address and consent of land/ site owner for the installation and operation of the proposed activity or storage location of equipment or vehicle	Required	☑ Yes ☐ No		☐
Name, address and phone number of the Operating Authority	N/A	☐ Yes ☐ No		☐
Copy of NEPDA Permit	N/A	☐ Yes ☐ No		☐
Copy/Proof of Municipal Planning Approval (ORMCA, general)	N/A	☐ Yes ☐ No		☐
Municipal Zoning Confirmation Letter	N/A	☐ Yes ☐ No		☐
Zoning map	Required	☑ Yes ☐ No		☐
Conservation Authority Clearance	N/A	☐ Yes ☐ No		☐
Director's approval for Policy 2 Deviation	N/A	☐ Yes ☐ No		☐
Application Fee	Required	☐ Yes ☑ No	Submitted upon receipt of reference #	☐

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.1 General)

6.2 Air

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Emission Summary and Dispersion Modelling (ESDM) Report prepared in accordance with s. 22 and of O. Reg. 419/05 (including signed checklist)	Required	☑ Yes ☐ No		☑
Electronic copy of the Dispersion Modelling input and output files prepared in accordance with s. 26 of O. Reg. 419/05	Required	☑ Yes ☐ No		☑
Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S. 9	N/A	☐ Yes ☐ No		☐
Copies of forms requesting O. Reg. 419/05 instruments and supporting documentation	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.2 Air)

6.3 Noise and Vibration

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Primary Noise Screening	N/A	☐ Yes ☐ No		☐
Secondary Noise Screening	N/A	☐ Yes ☐ No		☐
Acoustic Assessment Report including signed checklist (AAR)	Required	☑ Yes ☐ No		☑
Vibration Assessment Report	N/A	☐ Yes ☐ No		☐
Noise Abatement Action Plan	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.3 Noise and Vibration)

6.4 Sewage Works

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Signed Municipal Responsibility Agreement	N/A	☐ Yes ☐ No		☐
Detailed description of the proposed activities/works	N/A	☐ Yes ☐ No		☐
Notice of Completion for the Environmental Study Report (ESR)	Optional	☐ Yes ☐ No		☐
Design Brief	N/A	☐ Yes ☐ No		☐
Preliminary Engineering Report	Optional	☐ Yes ☐ No		☐
Final Plans	N/A	☐ Yes ☐ No		☐
Engineering Drawings and Specifications	N/A	☐ Yes ☐ No		☐
Sewage quantity and quality characteristics	N/A	☐ Yes ☐ No		☐
Stormwater Management Report	N/A	☐ Yes ☐ No		☐
Stormwater Management Plan	N/A	☐ Yes ☐ No		☐
Hydrogeological Assessment with proof of concurrence from the Ministry's Regional technical support section	N/A	☐ Yes ☐ No		☐
Environmental Impact Analysis	Optional	☐ Yes ☐ No		☐
Final effluent criteria accepted with proof of concurrence from the Ministry's Regional Technical Support Section	N/A	☐ Yes ☐ No		☐
Sewage Works Operational Flexibility Requirements - Engineer's Report	N/A	☐ Yes ☐ No		☐
Sewage Works Operational Flexibility Requirements - Declarations	N/A	☐ Yes ☐ No		☐
Pipe Design Data Form	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.4 Sewage)

6.5 Waste Disposal Sites

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Design and Operations Report	N/A	☐ Yes ☐ No		☐
Stormwater Management Report	Optional	☐ Yes ☐ No		☐
Hydrogeological Assessment with proof of concurrence from the Ministry's Regional technical support section	N/A	☐ Yes ☐ No		☐

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Assessment of Physical and Water Use Conditions	Optional	☐ Yes ☐ No		☐
Waste Operational Flexibility Requirements - Engineer's Report	N/A	☐ Yes ☐ No		☐
Waste Operational Flexibility Requirements - Declarations	N/A	☐ Yes ☐ No		☐
Copy of notification to adjacent landowners	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐
Hauled Sewage Disposal Sites - Additional Supporting Documentation				
Soil Evaluation / Analysis	N/A	☐ Yes ☐ No		☐
Local Groundwater Conditions Report (e.g. well water records, data to support inferred groundwater flow, groundwater monitoring data, hydrogeological assessment with proof of concurrence from the Ministry's regional technical support section)	N/A	☐ Yes ☐ No		☐
Surface Water Assessment Report (e.g. surface water monitoring data, description of aquatic habitat, surface water users, existing stressors, description of proposed measures to minimize risks)	N/A	☐ Yes ☐ No		☐
Map showing location of the site in relation to local features	N/A	☐ Yes ☐ No		☐
Processed Organic Waste (Biosolids) Land Application Sites - Additional Supporting Documentation				
Soil Evaluation / Analysis	N/A	☐ Yes ☐ No		☐
Processed Organic Waste Analysis	N/A	☐ Yes ☐ No		☐
Overview of Beneficial Use and Risk Management Measures	N/A	☐ Yes ☐ No		☐
Map showing location of the site in relation to local features	N/A	☐ Yes ☐ No		☐

✓ Completion Status (6.5 Waste Disposal Sites)

6.6 Waste Management Systems

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Proof of vehicle and/or equipment ownerships	N/A	☐ Yes ☐ No		☐
Complete Fleet List (list of all vehicles, trailers and equipment used)	N/A	☐ Yes ☐ No		☐
Copy of the Liability Insurance for all vehicles for which insurance is required	N/A	☐ Yes ☐ No		☐
Copy of the storage tank design	N/A	☐ Yes ☐ No		☐

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Copy of commercial vessel licence	N/A	☐ Yes ☐ No		☐
Description of the physical location where the vehicles transporting biomedical waste are being disinfected	Optional	☐ Yes ☐ No		☐
Drivers Training Manual (for PCB/ Biomedical Waste)	Optional	☐ Yes ☐ No		☐
A copy of the applicant's Operation Plan including detailed packaging and biomedical waste handling methods	Optional	☐ Yes ☐ No		☐
Contingency and Emergency Procedures Plan (for PCB/ Biomedical Waste/Hauled Sewage (Septage))	Optional	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.6 Waste Management Systems)

6.7 Mobile Waste Processing ☐ N/A

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Design and Operations Report - Mobile Waste Processing of General Waste	N/A	☐ Yes ☐ No		☐
Design and Operations Report - Mobile Waste Processing of Liquid Waste	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.7 Mobile Waste Processing)

6.8 Cleanup of Contaminated Sites ☐ N/A

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential/ Not Suitable for Public Viewing
Design Report for Cleanup of Contaminated Sites	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.8 Cleanup of Contaminated Sites)

6.9 Other Attachments ☐ N/A

Title	Reference	Confidential/ Not Suitable for Public Viewing
		☐

Is there an attachment of an additional list of attachments?

☐ Yes ☑ No

If there is not enough space to list all of the attachments included in this application package, please include an additional listing of these attachments.

✓ Completion Status (6.9 Other Attachments)

6.10 Confidentiality / Not Suitable for Public Viewing

Note** Although the applicant may identify the supporting information as confidential, the information is subject to the FIPPA and EBR.

For each attachment selected in tables 6.1 to 6.9 as having confidential information, provide an explanation for confidentiality / why the attachment(s), or information within the attachment(s) is not suitable for public viewing.

Please provide a redacted copy of this document(s) that can be used for public viewing.

Attachment containing confidential information (i.e. Name of document)	Explanation for Confidentiality	Redacted Copy Attached?	Explanation is Confidential/Not Suitable for Public Viewing
		☐ Yes ☐ No	☐

✓ Completion Status (6.10 Confidentiality / Not Suitable for Public Viewing)

Attachments

File Name	Size (MB)	Selected File
		☐
Total		

Please note: The collection of personal information in this application is necessary to administer the Ministry's approvals program, which is authorized pursuant to the *Environmental Protection Act* and the *Ontario Water Resources Act*. The personal information collected in this application will be used to administer the program, including for the purposes of the Ministry's compliance and enforcement activities under the aforementioned acts, and for the purposes of making information in respect of Environmental Compliance Approvals available to the public with the exception of payment information. Questions about the collection of the information can be directed to a Client Service Representative, Client Services and Permissions Branch, 135 St. Clair Avenue West, 1st Floor, Toronto ON M4V 1P5; Telephone outside Toronto 1-800-461-6290 or in Toronto 416-314-8001 or Fax 416-314-8452.

7. Authorization

7.1 Statement of the Applicant

I am authorized to prepare and submit this application and to make this certification. I have reviewed the complete application and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The information contained in this application is complete and accurate.
- The Technical Contact(s) identified in this application has/have been authorized to prepare certain technical material, and act on behalf of the applicant to discuss this application with the Ministry of the Environment, Conservation and Parks and to provide additional information about this application to the Ministry on request.
- The information provided to the Technical Contact(s) in relation to this application is complete and accurate.

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17. *

Name of Signing Authority (Please print) *			
Nathan Downie			
Title *			
Project Manager			
Telephone Number	ext.	Mobile Number	Fax Number
780-799-9961			
Email Address			
nathan.downie@bird.ca			
Signature (hard copy submission must be signed)			Date (yyyy/mm/dd) *
			2023/02/22

✓ Completion Status (7.1 Statement of the Applicant)

7.2 Statement of the Municipality ☐ N/A

I, the undersigned hereby declare on behalf of the Municipality, that the Municipality has no objection to the construction of the works in the Municipality.

☐ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17.

Name (Please print)		
Title	Name of Municipality	
Signature (hard copy submission must be signed)		Date (yyyy/mm/dd)

✓ Completion Status (7.2 Statement of the Municipality)

7.3 Statement of Technical Contacts

Technical Contact 1

I have been authorized by the applicant to prepare the technical materials for the area(s) of responsibility identified in section 2.6 that are included in the application. I have reviewed those technical materials and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The technical materials contained in this application in respect of the area(s) of responsibility identified in section 2.6 are complete and accurate.
- I have the relevant education and experience necessary to provide this certification.

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17. *

Name of Technical Contact (Please print) *	
Thomas Li	
Signature (hard copy submission must be signed) 	Date (yyyy/mm/dd) * 2023/02/22

Technical Contact 2

I have been authorized by the applicant to prepare the technical materials for the area(s) of responsibility identified in section 2.6 that are included in the application. I have reviewed those technical materials and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The technical materials contained in this application in respect of the area(s) of responsibility identified in section 2.6 are complete and accurate.
- I have the relevant education and experience necessary to provide this certification.

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17. *

Name of Technical Contact (Please print) *	
Michael Wells	
Signature (hard copy submission must be signed) 	Date (yyyy/mm/dd) * 2023/03/15

✓ Completion Status (7.3 Statement of Technical Contacts)

8. Payment Information - Application for an Environmental Compliance Approval

Payment Options *

The information collected in this section of the form is considered confidential and will only be used to process the application fee. All fees should be paid in Canadian funds.

☐ **Pay online** (under $10,000)

- Ensure the application form is complete before paying your application fee online.
- The application form and supporting documents (attached in Section 6) will be automatically emailed (up to 13 MB of data) to the Client Services and Permissions Branch after payment has been confirmed.
- If your submission is greater than 13 MB, do not attach the supporting documents, send us a link to download your files by emailing ECA.submission@ontario.ca.

☐ **Credit card payment by mail** (address below) **or facsimile** at 416-314-8452 (under $10,000)

Type of Credit Card ☐ VISA ☐ MasterCard	Credit Card Number	Expiry Date (mm/yy)
Name on Credit Card (please print)		
Credit Card Holder's Company Name		
Card Holder's Signature		Date (yyyy/mm/dd)

- Email the application package to ECA.submission@ontario.ca. Wait for the Ministry to provide the reference number, then complete the Application Summary Page below (include the reference number), and mail or fax it to the Client Services and permissions Branch.
- To protect credit card information, do not submit this page containing payment information via e-mail. **Applications containing credit card information that are submitted via e-mail will not be processed and will be destroyed.**

☐ **Certified cheque** (payable to the Minister of Finance)

☐ **Money order** (payable to the Minister of Finance)

If payment by **certified cheque or money order**, email the application package to ECA.submission@ontario.ca.
Wait for the Ministry to provide the reference number, then complete the Application Summary Page below (include the reference number), staple the cheque / money order to the page, and mail it to the Client Services and Permissions Branch.

Mailing Address

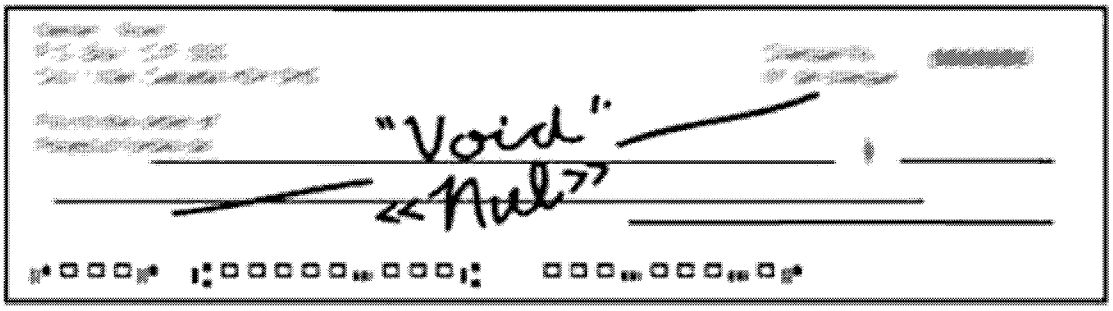
Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave W, 1st Floor
Toronto ON M4V 1P5

If this form has been completed by hand, the fee calculations must be completed and attached separately. The supplemental fee calculations do not need to be included if this form has been completed electronically.

If this form has been completed electronically, the fees for this application have been calculated based on the information provided. The Ministry may require additional information during the review of the application that could impact the total fee required.

☒ Completion Status (8 Payment Information)

If paying by certified cheque or money order, please attach it here.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Application Summary

Reference Number	Payment Received ($)	Date (yyyy/mm/dd)	Initials

Applicant Name
Bird Construction Industrial Services Ltd.

Project Name
SE1185.001

Project Description Executive Summary
Bird Construction Industrial Services Ltd. (Bird) is proposing to construct a ready-mix portable concrete batching facility located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River.

The purpose of this application is to obtain an Environmental Compliance Approval with Limited Operational Flexibility (LOF) and to assess the facility's compliance with O. Reg 419/05.

Bird's operations will be covered under NAICS code 327320 – Ready-Mix Concrete Manufacturing. Bird will be producing ready-mix concrete for its clients by means of mixing aggregates, sand, cement, cement supplements, admixtures, and water. The activities at the facility will include transfer of materials to stockpiles, bins, conveyor, elevated scale, mixer, trucks, and storage silos. Potential emissions will include particulate matter and metals and by-products of combustion.

The maximum production capacity for the facility will be 800 m3/day.

The facility is expected to operate twenty-four (24) hours per day, five (5) days per week, with occasional weekends, if required. The facility will be operating 12 hours per day during the daytime hours at full capacity, and at 30% capacity at nighttime as required.

Supplemental Application Information
The plant is anticipated to start operation as soon as the applicant receives an Environmental Compliance Approval.

Hard copies are no longer required; therefore, hard copies were not sent to the approvals branch nor the local district office.

Application Status

Section	Completed?			
1. Application Information	☑	Yes	☐	No
2. Project Information	☑	Yes	☐	No
3. Regulatory Requirements	☑	Yes	☐	No
4. Site Information	☑	Yes	☐	No
5. Facility Information	☑	Yes	☐	No
6. Supporting Documentation	☑	Yes	☐	No
7. Authorization	☑	Yes	☐	No
8. Payment Information	☐	Yes	☒	No

Fee Summary

Activity	Amount ($)
Administrative Processing	$200.00
Review of EPA s. 9 activities	$4,700.00
Review of EPA s. 27 activities	$0.00
Review of OWRA s. 53 activities	$0.00
Total Fee	$4,900.00

The Ministry may request additional fees upon review of this application.
If this form is submitted in print version only and the smart calculation feature is not used, please attach the fee calculation separately.

SONAIR
ENVIRONMENTAL

SECTION 1A

CONFIDENTIALITY RATIONALE

SONAIR ENVIRONMENTAL

Professional Engineers Ontario

February 22, 2023

Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
1st Floor
135 St. Clair Ave. West
Toronto, Ontario
M4V 1P5

Re: Confidentiality Rationale

Information provided by Bird Construction Industrial Services Ltd. in support of this Environmental Compliance Approval (ECA) application contains proprietary and privileged information that if disclosed has the potential to impact the company's competitive position in the industry and cause financial harm. This includes but is not limited to: process descriptions, production rates, formulations, raw materials, and/or equipment specifications. It is therefore requested that all information contained with this ECA application remain confidential unless otherwise directed, in writing, by an officer of the company.

Release of this document, or any information contained within, in full or in part, is subject to the Freedom of Information and Protection of Privacy Act (FIPPA).

Should you have any questions, please contact the undersigned at (905) 920-3060.

Sincerely,

SONAIR Environmental Inc.

Per: Thomas Li, MEPP, P.Eng
Principal Consultant
tli@SONAIRenviro.com

SONAIR
ENVIRONMENTAL

SECTION 1B

VERIFICATION OF LEGAL NAME

Pages 43 to / à 45

are withheld pursuant to section

sont retenues en vertu de l'article

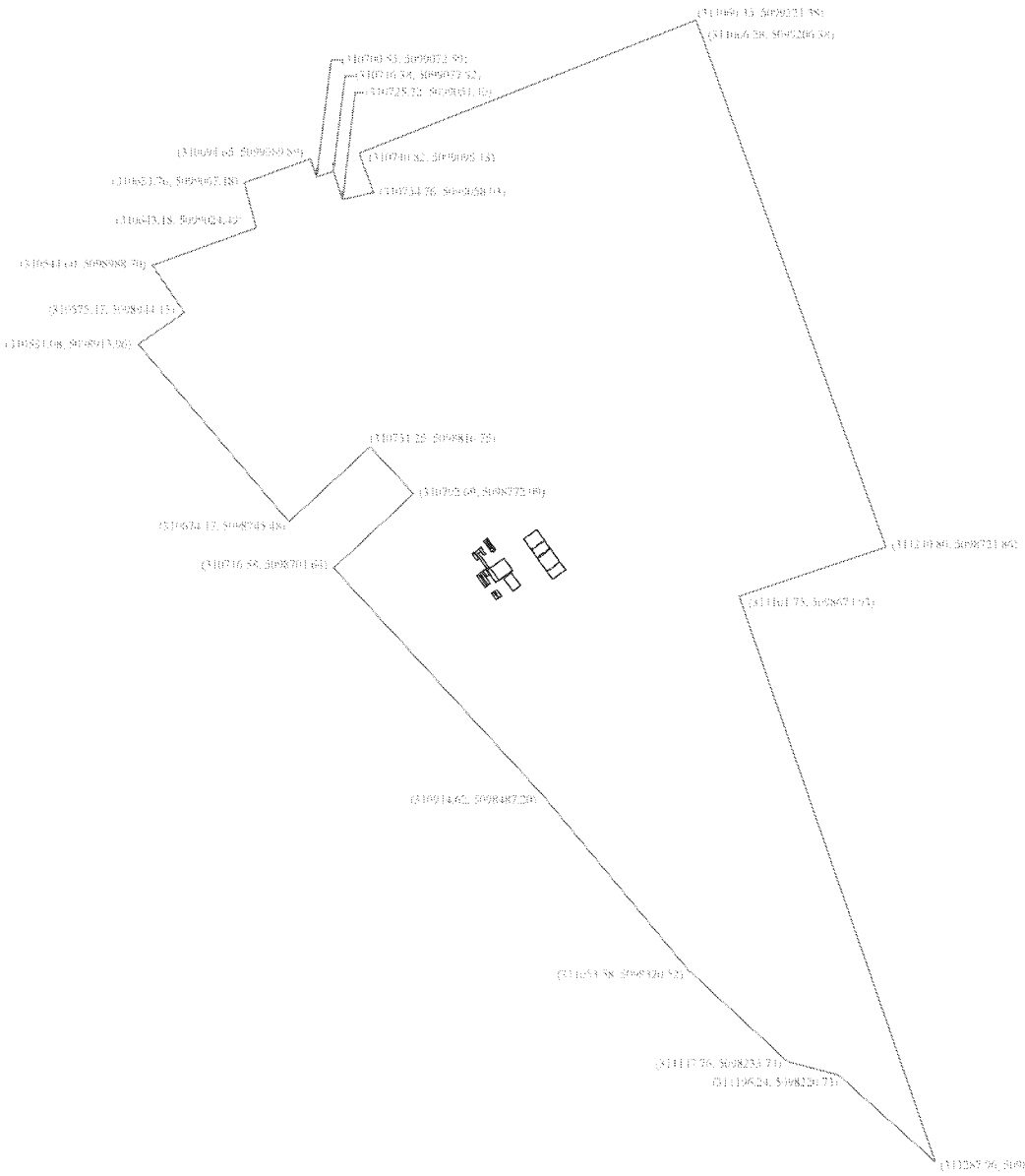
22

of the Freedom of Information and Protection of Privacy Act

de la Freedom of Information and Protection of Privacy Act

SECTION 1C

SCALED AREA LOCATION PLAN



0 25 75 150
SCALE

N

SONAIR ENVIRONMENTAL

ADDRESS:	DRAWN BY:	CHECKED BY:	CLIENT'S NAME:	CLIENT'S ADDRESS:	SCALE:
PO BOX 56702 PINE VALLEY PO VAUGHAN, ON L4L 8V3	BAS	TL	Bird Construction Industrial Services Ltd.	400-5700 Explorer Drive Mississauga. ON L4W 0C6	As shown
SE#:	DATE:	DRAWING NAME:	REVISION #:	NOTES:	
1185.001	2023-01-17	Site Layout	0	Site at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River	

SECTION 1D

ENVIRONMENTAL BILL OF RIGHTS (EBR) POSTING

SONAIR ENVIRONMENTAL

Professional Engineers Ontario

February 21, 2023

Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
1st Floor
135 St. Clair Ave. West
Toronto, Ontario
M4V 1P5

Re: Environmental Bill of Rights (EBR) Posting

Bird Construction Industrial Services Ltd. (Bird) is proposing to construct a ready-mix portable concrete batching facility located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River.

The purpose of this application is to obtain an Environmental Compliance Approval with Limited Operational Flexibility (LOF) and to assess the facility's compliance with O. Reg 419/05.

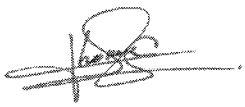
The maximum production capacity for the facility will be 800 m^3/day.

The activities at the facility will include transfer of materials to stockpiles, bins, conveyor, elevated scale, mixer, trucks, and storage silos. Potential emissions will include particulate matter, metals and by-products of combustion. The facility is expected to operate twenty-four (24) hours per day, five (5) days per week, with occasional weekends, if required. The facility will be operating 12 hours per day during the daytime hours at full capacity, and at 30% capacity at nighttime as required.

Should you have any questions, please contact the undersigned at (905) 920-3060.

Sincerely,

SONAIR Environmental Inc.



Per: Thomas Li, MEPP, P.Eng
Principal Consultant
tli@SONAIRenviro.com

SONAIR
ENVIRONMENTAL

SECTION 1E

LANDLORD AUTHORIZATION LETTER

K&T Trucking
1063445 ON Inc.

February 8, 2023

RE:

Bird Construction Industrial Services Ltd.

400-5700 Explorer Drive

Mississauga, ON L4W 0C6

Attn: Ministry of the Environment, Conservation and Parks

As the *landlord* of the rental property located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River, I, Tracy Lance, give permission for *Bird Construction Industrial Services Ltd.* to perform the activities and operations in support of their ready-mix portable concrete batching plant operations on-site.

Please do not hesitate to contact us should there be any questions.

Sincerely,

<Signature>

Tracy Lance
Owner of 1063445 ON Inc. O/A K&T Trucking
613-401-1166

SECTION 1F

PRE-CONSULTATION RECORD

Nathan Downie

To: Veronika Grotowska
Subject: RE: Pre-consultation for ECA for Portable Batching Plant in Chalk River

From: Eckert, Brad (MECP) <Brad.Eckert@ontario.ca>
Sent: Wednesday, October 12, 2022 9:17 AM
To: Veronika Grotowska <Veronika.Grotowska@bird.ca>
Cc: Ponalo, Thandeka (MECP) <Thandeka.Ponalo@ontario.ca>
Subject: RE: Pre-consultation for ECA for Portable Batching Plant in Chalk River

Hi Veronika, Yes, that basically covers the discussion. It would help if you could arrange for a copy of the application to be sent to our office as well.

thanks

Brad Eckert

Senior Environmental Officer
Ontario Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive, Ottawa
K1H 1E1
(613) 521-3450 ext. 228
(613) 866-0928 (Cell)
1-800-860-2195

From: Veronika Grotowska <Veronika.Grotowska@bird.ca>
Sent: October 12, 2022 9:10 AM
To: Eckert, Brad (MECP) <Brad.Eckert@ontario.ca>
Subject: Pre-consultation for ECA for Portable Batching Plant in Chalk River

Good morning Brad,

Thank you for your chat yesterday. I wanted to write a summary of our discussion to keep as a written record. Please confirm by replying to this email with any corrections, and your email signature showing your authority in making these recommendations.

Project Background:
Bird Construction is looking to build a portable concrete batching plant on leased private land in Chalk River Ontario. The batching plant is slated to operate for 3 years to supply concrete for a CNL nuclear project nearby. We're planning on starting construction on site in January 2023 (when we're expecting to get a building permit), and we're hoping to be able to operate the batching plant by April 2023. Once the batching plant is built, Bird Construction is going to sublease the batching plant to a concrete operator, Hanson, who will operate it.

Summary of rules:

- The ECA is applied to the equipment owner. In this case Bird Construction is to apply for the ECA.

- The ECA considers this to be a permanent structure due to the length of operation (3 years)
    - The ECA considers a temporary application to be 60 days or less of operation in one location per year.
- Bird Construction will apply for a permanent ECA now, and can apply for temporary ECA in the future, should we decide to use the batching plant in another location for less than 60 days/year.

Summary of other discussions

- Bird Construction realizes that there is a risk that the batching plant won't be able to operate in April 2023, as the MECP has 12 months to give a decision.
    - We intend to apply for priority consideration, under the "implements government priorities" criteria. Application for priority consideration does not guarantee priority.

Thank you for your time. Please feel free to reach out to me for any clarification.

Veronika Grotowska, Assistant Project Manager
Email. Veronika.Grotowska@bird.ca
Cell 437.684.5582
770 Palladium Dr, Kanata, ON, K2V 1C8 www.bird.ca

SONAIR
ENVIRONMENTAL

SECTION 2

EMISSION SUMMARY AND DISPERSION MODELLING (ESDM) REPORT

EMISSION SUMMARY AND DISPERSION MODELLING REPORT

FOR

BIRD CONSTRUCTION INDUSTRIAL SERVICES LTD.

SUBMITTED TO:

Bird Construction Industrial Services Ltd.
400-5700 Explorer Drive
Mississauga, Ontario, L4W 0C6

SUBMITTED BY:

Ben Sprang
Project Technologist
bsprang@SONAIRenviro.com

Thomas Li, MEPP, P.Eng
Principal Consultant
tli@SONAIRenviro.com

SE #: 1185.001

February 22, 2023

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Ontario

Ministry of the Environment and Climate Change

Emission Summary and Dispersion Modelling Report Checklist

Company Name

Bird Construction Industrial Services Ltd.

Company Address

Unit Number	Street Number	Street Name	PO Box
400	5700	Explorer Drive	

City/Town	Province	Postal Code
Mississauga	Ontario	L4W 0C6

Location of Facility

Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with s. 26 of O. Reg. 419/05 and the guidance in the MOE document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009 and "Air Dispersion Modelling Guideline for Ontario" dated March 2009 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact

Company Contact

Company Contact Name

Last Name	First Name	Middle Initial
Downie	Nathan	

Title	Telephone Number
Project Manager	780 799-9961

Signature	Date (yyyy/mm/dd)
	2023/03/16

Technical Contact

Technical Contact

Technical Contact Name

Last Name	First Name	Middle Initial
Li	Thomas	

Representing	Telephone Number
SONAIR Environmental Inc.	905 920-3060

Signature	Date (yyyy/mm/dd)
	2023/02/22

* This checklist is taken from the document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009.

Emission Summary and Dispersion Modelling Report Checklist

	Required Information	Submitted	Explanation/Reference
	Executive Summary and Emission Summary Table		
	1.1 Overview of ESDM Report	☑ Yes	Executive Summary
	1.2 Emission Summary Table	☑ Yes	Executive Summary
1.0	**Introduction and Facility Description**		
	1.1 Purpose and Scope of ESDM Report (when report only represents a portion of facility)	☑ Yes	Section 1.1
	1.2 Description of Processes and NAICS code(s)	☑ Yes	Section 1.2
	1.3 Description of Products and Raw Materials	☑ Yes	Section 1.3
	1.4 Process Flow Diagram	☑ Yes	Section 1.4
	1.5 Operating Schedule	☑ Yes	Section 1.5
2.0	**Initial Identification of Sources and Contaminants**		
	2.1 Sources and Contaminants Identification Table	☑ Yes	Table 1
3.0	**Assessment of the Significance of Contaminants and Sources**		
	3.1 Identification of Negligible Contaminants and Sources	☑ Yes	Section 3.1
	3.2 Rationale for Assessment	☑ Yes	Section 3.2
4.0	**Operating Conditions, Emission Rate Estimating and Data Quality**		
	4.1 Description of operating conditions, for each significant contaminant that results in the maximum POI concentration for that contaminant	☑ Yes	Section 4.1
	4.2 Explanation of Method used to calculate the emission rate for each contaminant	☑ Yes	Section 4.2
	4.3 Sample calculation for each method	☑ Yes	Appendix B
	4.4 Assessment of Data Quality for each emission rate	☑ Yes	Appendix B
5.0	**Source Summary Table and Property Plan**		
	5.1 Source Summary Table	☑ Yes	Table 2
	5.2 Site Plan (scalable)	☑ Yes	Figure 2
6.0	**Dispersion Modelling**		
	6.1 Dispersion Modelling Input Summary Table	☑ Yes	Table 3
	6.2 Land Use Zoning Designation Plan	☑ Yes	Figure 4
	6.3 Dispersion Modelling Input and Output Files	☑ Yes	Appendix C
7.0	**Emission Summary Table and Conclusions**		
	7.1 Emission Summary Table	☑ Yes	Table 4
	7.2 Assessment of Contaminants with no MOE POI Limits	☑ Yes	Section 7.2
	7.3 Conclusions	☑ Yes	Section 7.3
	Appendices (Provide supporting information or details such as...)		
	Tables	☑ Yes	Tables Section
	Figures	☑ Yes	Figures Section
	Insignificant Sources/Contaminants, Emission Estimates, Dispersion Modeling, Supporting Materials	☑ Yes	Appendix A, B, C, D

EXECUTIVE SUMMARY

This Emission Summary and Dispersion Modelling (ESDM) report was prepared for Bird Construction Industrial Services Ltd. (Bird) who is proposing to construct a ready-mix portable concrete batching facility located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River. This report comprises an ESDM report in support of an ECA application with Limited Operational Flexibility (LOF).

Bird's operations will be covered under NAICS code 327320 – Ready-Mix Concrete Manufacturing. Bird will be producing ready-mix concrete for its clients by means of mixing aggregates, sand, cement, cement supplements, admixtures, and water. The activities at the facility will include transfer of materials to stockpiles, bins, conveyor, elevated scale, mixer, trucks, and storage silos. Potential emissions will include particulate matter, metals and by-products of combustion.

The ESDM Report was prepared in accordance with s.25 & s.26 of Ontario Regulation 419/05 (O. Reg 419/05), as well as following guidance from the Ministry of Environment, Conservation and Parks (MECP) publication *"Procedure for Preparing an Emission Summary and Dispersion Modelling Report"*, dated March 2018, as appropriate.

U.S. EPA's AERMOD dispersion model was used to predict concentration at points of impingement (POI). The maximum predicted concentrations for all contaminants were compared against their Schedule 3 limits, and all POI concentrations were found to be below their respective standard or guideline value. As such, the ESDM report demonstrated that the Bird facility can operate in compliance with the requirements of O. Reg 419/05.

Table 4. Emission Summary Table

Contaminant	CAS #	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m³)	Averaging Period (h)	MECP POI Limit (µg/m³)	Limiting Effect	Reg. Sch. No.	% of MOE POI Limit
Arsenic	7440-38-2	3.24E-05	AERMOD	4.49E-03	24	0.3	Health	G	1%
Beryllium	7440-41-7	7.34E-07	AERMOD	9.78E-05	24	0.01	Health	3	1%
Cadmium	7440-43-9	1.14E-07	AERMOD	1.60E-05	24	0.025	Health	3	0%
				1.60E-05	24	0.25	-	URT	<0.01%
Chromium (metallic, di and trivalent)	7440-47-3	3.05E-05	AERMOD	4.10E-03	24	0.5	Health	3	1%
				4.10E-03	24	5	-	URT	0%
Lead (and its compounds)	7439-92-1	9.84E-06	AERMOD	1.32E-03	24	0.5	Health	3	0%
				1.32E-03	24	2	-	URT	0%
				6.51E-04	30 days	0.2	Health	3	0%
Manganese (and its compounds)	7439-96-5	1.62E-04	AERMOD	2.41E-02	24	0.4	Health	3	6%
				2.41E-02	24	4	-	URT	1%
Nickel (and its compounds)	7440-02-0	3.37E-05	AERMOD	4.64E-03	24	2	-	URT	0%
				4.64E-03	24	2	-	DAV	0%
				1.38E-03	Annual	0.04	Health	3	3%
				1.38E-03	Annual	0.4	-	AAV	0%
Nitrogen Oxide	10102-44-0	9.13E-02	AERMOD	9.35E-01	1	400	Health	3	79%
				4.17E-01	24	200	Health	3	69%
Particulate Matter	n/a - PM	1.60E+00	AERMOD	4.70E+01	24	120	Visibility	3	39%
PM10	14808-60-7	1.69E-02	AERMOD	1.72E+00	24	5	Health	G	34%
Selenium	7782-49-2	6.62E-06	AERMOD	8.64E-04	24	10	Health	G	<0.01%
Silicate, portland cement	65997-15-1	2.32E-01	AERMOD	3.14E+01	24	90	Health	SL-MD	35%
Total Phosphorus	7723-14-0	1.03E-04	AERMOD	1.45E-02	24	0.5	Health	SL-MD	3%

3 = Schedule 3 of Reg. 419
G = Guideline Value
DAV = Daily Assessment Value
AAV = Annual Assessment Value
URT = Upper Risk Threshold
SL-JSL = Screening Level - Jurisdictional Screening Level
SL-PA = Screening Level - Previously Accepted
SL-MD = Screening Level - Ministry Derived

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICIES

1.0 INTRODUCTION AND FACILITY DESCRIPTION

Bird Construction Industrial Services Ltd. (Bird) retained SONAIR Environmental Inc. (SONAIR) to prepare an Emission Summary & Dispersion Modelling (ESDM) Report for its proposed ready-mix portable concrete batching facility at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River.

The ESDM Report was prepared in accordance with s.25 & s.26 of Ontario Regulation 419/05 (O. Reg 419/05), as well as following guidance from the Ministry of Environment, Conservation and Parks (MECP) publication *"Procedure for Preparing an Emission Summary and Dispersion Modelling Report"*, dated March 2018, as appropriate.

1.1 Purpose and Scope of ESDM Report

The purpose of this ESDM report is to assess the facility's compliance with O.Reg 419/05. The facility is required to prepare an ESDM report for an ECA application in accordance with s.22 of the Ontario Regulation 419/05 (O. Reg 419/05), as well as following guidance from the MECP publication *"Procedure for Preparing an Emission Summary and Dispersion Modelling Report"*, dated March 2018, as appropriate.

1.2 Description of Process and NAICS Code(s)

Bird is proposing to construct a ready-mix portable concrete batching facility at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River. The operations at the facility will be covered under NAICS code 327320 – Ready-Mix Concrete Manufacturing.

The facility will be producing various grades of ready-mix concrete which will be manufactured from raw materials, including sand, aggregate, powdered cement, supplements (slag, fume silica and admixtures) and water.

The plant will have a peak capacity of 800 cubic meters per day. A detailed description of the manufacturing process is provided below.

Raw materials including sand and coarse aggregate will be delivered by highway trucks and stored in stockpiles. Cement and supplement materials will be delivered by tanker trucks and pneumatically transferred into the silos that will be equipped with pulse jet baghouses. A loader will be used to feed the stockpiled material into the bins/hopper attached to the plant. The bins

will be equipped with a "flying" aggregate dosing and weighing system where aggregate will be dosed by belt feeders to guarantee fast, precise and smooth dosing. Materials will be transferred, via an enclosed conveyor, to enclosed modules that will consist of elevated scale, mixer equipped with a dust collector, and truck loading point equipped with a long sock. Cement and supplement materials from the silos will also convey the required material quantities to the mixer before transferring dry products into the trucks to be mixed with water and admixtures. During cooler operating periods, a Polarmatic steam generator with the exhaust piped through the feed bins, will be used to heat the sand and aggregate prior to it being used in production. The steam generator (boiler) will be located inside a steel enclosure.

Power to the plant will be provided by Hydro. One standby power diesel generator will be located on-site for emergency purposes only.

For each step, various pollutants are emitted into the air, as shown in Figure 1.

1.3 Description of Products and Raw Materials

Bird will primarily be engaging in the production of concrete for its customers. Raw materials will include aggregates, sand, and cement, cement supplements (slag and silica fume), and admixture materials.

The maximum production capacity for the facility will be 800 m^3/day.

1.4 Process Flow Diagram

Figure 1 in the Figures Section provide a simplified process flow diagram.

1.5 Operation Schedule

The facility is expected to operate twenty-four (24) hours per day, five (5) days per week, with occasional weekends, if required. The facility will be operating 12 hours per day during the daytime hours at full capacity, and at 30% capacity at nighttime as required.

2.0 INITIAL IDENTIFICATION OF SOURCES AND CONTAMINATION

2.1 Sources and Contaminants Identification Table

Table 1 in the Tables section of this report contains the Source and Contaminants identification Table.

3.0 ASSESSMENT OF THE SIGNIFICANT OF CONTAMINANTS AND SOURCES

3.1 Identification of Negligible Contaminants and Sources

Appendix A contains the list of all sources/contaminants deemed insignificant. Provided below is the rationale.

3.2 Rationale for Assessment

- Emissions from on-site compressors, have been deemed insignificant as no significant emissions are expected from the compressors. Only heat and moisture are expected from these processes.
- Small quantities (typically less than 1%) of admixtures are added directly into the ready-mix trucks to achieve certain properties in the concrete. Admixtures are typically non-volatile aqueous solutions with low vapour pressures. Given the low temperature handling of compounds with a low vapor pressure (expected to be less than 1 kPa), admixtures have been deemed insignificant in accordance with Table B-3 of the MECP guidance document.
- One standby power diesel generator has been deemed insignificant in accordance with Table B-3B. The generator is rated at 410 kW and is likely to be located away from the property line, and located in close proximity to the proposed equipment.
- Fugitive emissions from unpaved roadways, stockpiles, and loading/unloading operations have been deemed insignificant. The facility will be implementing a Best Management Practices Plan for Control of Fugitive Dust Emissions; therefore, particulate matter from fugitive sources will not be included as part of the ESDM report as per the "*Procedure for Preparing an Emission Summary and Dispersion Modelling Report*". A copy of the BMPP can be found in Appendix D.

4.0 OPERATING CONDITIONS, EMISSIONS RATE ESTIMATING AND DATA QUALITY

4.1 Description of Operating Conditions

Emission calculations and dispersion modelling were based on the following worst case operating conditions:

- It is assumed that all processes and activities are operated and performed simultaneously.
- A maximum of 800 m^3 per day of concrete production.
- The facility operates 24 hours per day, 7 days per week.

4.2 Explanation of Method Used to Calculate Emission Rate

Appendix B provides detailed explanations of the estimates. The following is the general methodology used.

- Particulate matter emissions from the stockpiles and bin loading (sources AGG1, AGG2, BIN1) were determined using the drop equation from the US EPA AP-42 *"Aggregate Handling and Storage Piles"*, Section 13.2.4, November 2006. It is unknown if the aggregate and sand is received washed; therefore, as a conservative approach, a moisture content of 0.25% (lower limit) was used. The wind speed was based on the average wind speed obtained from the MECP regional met data.
- Particulate matter emissions from the stockpiles, bins, conveyor, elevated scale, mixer, and truck loading point (sources AGG1, AGG2, BIN1, CON1, SC1, DC1, LP1) were determined using emission factors from the US EPA AP-42 "*Concrete Batching*", Section 11.12, June 2006.
- PM10 emissions from the stockpiles, bins, conveyor, elevated scale, mixer, truck loading point, and storage silos (sources AGG1, AGG2, BIN1, CON1, SC1, DC1, LP1, BH1, BH2, BH3) were determined using the highest percentage (by weight) of crystalline silica, which was conservatively assumed for the cement and slag material. Crystalline silica content from the aggregate was obtained from an aggregate test report. No specific crystalline silica content was provided in the sand report; however, the cleanliness of the sand, which is based on 80 µm was used. Given that crystalline silica is less than 10 µm, assuming the entire percent content is crystalline silica is considered conservative. No crystalline silica content was also provided in the silica fume cementitious material.

However, it was assumed that the entire percent content of SiO_2 is of crystalline silica to be conservative.

- Particulate matter emissions from the pulse-jet and vibrator type dust collectors (sources DC1, BH1, BH2, BH3) were determined using the MECP emission factor of 20 mg/m^3 for baghouses.
- Emission factors for metal emissions from silo loading and unloading (sources DC1, BH1, BH2, BH3, LP1) were obtained from US EPA AP-42 "*Concrete Batching*", Section 11.12, June 2006.
- Emission factors for portland cement from storage silo (sources DC1, BH1, BH2, BH3) and loading (source LP1) were obtained from the "*Proposed Standard Procedures for Evaluation Particulate Matter and Portland Cement Emissions from Concrete Batching*" by the MECP. Portland cement emission rate for Silo #1 was based on the same approach, but multiplying with the weight percent of the substance specified in the SDS.
- It was assumed that the cementitious material mixture consists of 75% material from Silo #1, while the remaining balance will consist of material from Silo #2 and Silo #3.
- A 90% control efficiency is conservatively assumed for enclosure of 3 sides and a top, with minimal openings as each stage of the process is continuously connected to each other, while a 25% control efficiency is assumed for a long sock at the loading point to contain the emissions during the truck loading process.
- The US EPA AP-42 emission factors for "*Liquified Petroleum Gas Combustion*", Section 1.5. Table 1.5-1. July 2008, were used to estimate the emission rates of contaminants from the industrial propane boiler.

4.3 Sample Calculation for Each Method

Sample calculations are provided in Appendix B.

4.4 Assessment of Data Quality for Each Emission Rate

Data quality assessments are provided in Appendix B.

5.0 SOURCE SUMMARY TABLE AND PROPERTY PLAN

5.1 Source Summary Table

Table 2 in the Tables section of this report contains the source summary table.

5.2 Site Plan

Figure 2 in the Figures section of this report contains the site plan.

6.0 DISPERSION MODELLING

6.1 Dispersion Modelling Input Summary Table

Table 3 in the Tables section of this report contains the Dispersion Modelling Input Summary Table.

The dispersion modelling was conducted in accordance with MECP publication *Air Dispersion Modelling Guideline for Ontario, Version 3, 2017.* AERMOD version (v.19191) has been used to predict maximum POI concentrations resulting from facility emissions, using the averaging periods specified in O. Reg 419/05. A five (5) year data set (1996-2000) of hourly meteorological readings for the Eastern Region was used in the AERMOD model, and as the land around the facility is mostly forest, the FOREST land-use was selected.

Drop emissions have been estimated for each AERMOD wind category using the maximum wind speed (m/s) for each category, where F is the maximum hourly wind speed for the met data set. The calculated factor for variable emissions was used for each category in AERMOD.

6.2 Land Use Zoning Designation Plan

Figure 4 in the Figures section of this report contains the Land Use Zoning Designation Plan.

6.3 Dispersion Modelling Input and Output Files

Copies of the Dispersion Modelling Input and Output Files are contained in Appendix C.

7.0 EMISSION SUMMARY TABLE AND CONCLUSIONS

7.1 Emission Summary Table

Table 4 in the Tables section of this report contains the Emission Summary Table.

7.2 Assessment of Contaminants with No MECP POI Limits

Two (2) contaminants without MECP standards/guidelines are emitted from the facility in significant amounts. The POI concentrations of both of these contaminants are below their MECP's SL-MD values.

7.3 Conclusions

POI concentrations were predicted using the AERMOD dispersion model, and compared against the Schedule 3 limits, where appropriate. The predicted concentrations were below the limits specified by O.Reg 419/05, and as such the facility is expected to be in compliance with O.Reg 419/05.

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TABLES

Table 1. Souces and Contaminants Identification Table

Source Information			Expected Contaminants	Included in Modelling? (Yes/No?)	Significant (Yes/No?)	Rationale
Source ID	Source Description	General Location				
AGG1	Aggregate Stockpile	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
AGG2	Aggregate Stockpile	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
SAN1	Sand Stockpile	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
BIN1	Storage Bins / Hopper	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
			Nitrogen Oxide	Yes	Yes	
CON1	Flying Weighing System & Conveyor	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
SC1	Elevated Scale	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
LP1	Loading Point	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
			Arsenic	Yes	Yes	
			Beryllium	Yes	Yes	
			Cadmium	Yes	Yes	
			Chromium (metallic, di and trivalent)	Yes	Yes	
			Lead (and its compounds)	Yes	Yes	
			Manganese (and its compounds)	Yes	Yes	
			Nickel (and its compounds)	Yes	Yes	
			Total Phosphorus	Yes	Yes	
			Selenium	Yes	Yes	
			Silicate, portland cement	Yes	Yes	
DC1	Mixer Dust Collector	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
			Arsenic	Yes	Yes	
			Cadmium	Yes	Yes	
			Chromium (metallic, di and trivalent)	Yes	Yes	
			Lead (and its compounds)	Yes	Yes	
			Manganese (and its compounds)	Yes	Yes	
			Nickel (and its compounds)	Yes	Yes	
			Total Phosphorus	Yes	Yes	
			Silicate, portland cement	Yes	Yes	
BH1	Baghouse	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
			Arsenic	Yes	Yes	
			Beryllium	Yes	Yes	
			Chromium (metallic, di and trivalent)	Yes	Yes	
			Lead (and its compounds)	Yes	Yes	
			Manganese (and its compounds)	Yes	Yes	
			Nickel (and its compounds)	Yes	Yes	
			Silicate, portland cement	Yes	Yes	

Table 1. Souces and Contaminants Identification Table

Source Information			Expected Contaminants	Included in Modelling? (Yes/No?)	Significant (Yes/No?)	Rationale
Source ID	Source Description	General Location				
BH2	Baghouse	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
			Arsenic	Yes	Yes	
			Beryllium	Yes	Yes	
			Cadmium	Yes	Yes	
			Chromium (metallic, di and trivalent)	Yes	Yes	
			Lead (and its compounds)	Yes	Yes	
			Manganese (and its compounds)	Yes	Yes	
			Nickel (and its compounds)	Yes	Yes	
			Total Phosphorus	Yes	Yes	
			Selenium	Yes	Yes	
			Silicate, portland cement	Yes	Yes	
BH3	Baghouse	Figure 3	Particulate Matter	Yes	Yes	
			PM10	Yes	Yes	
			Arsenic	Yes	Yes	
			Beryllium	Yes	Yes	
			Cadmium	Yes	Yes	
			Chromium (metallic, di and trivalent)	Yes	Yes	
			Lead (and its compounds)	Yes	Yes	
			Manganese (and its compounds)	Yes	Yes	
			Nickel (and its compounds)	Yes	Yes	
			Total Phosphorus	Yes	Yes	
			Selenium	Yes	Yes	
			Silicate, portland cement	Yes	Yes	
-	Standy Power Diesel Generator	Figure 3	Insignificant Emissions	No	No	Refer to Section 3.2

Table 2. Source Summary Table

Source ID	Source Description	Source Data							Emission Data						
		Flow Rate (m^3/s)	Exit Gas Temp (°C)	Inner Dia (m)	Height Above Grade (m)	Height Above Roof (m)	Discharge Type	Source Location (x,y)	Contaminant	CAS #	Maximum Emission Rate (g/s)	Avg. Period (h)	Emission Estimating Technique	Emissions Data Quality	% of Overall Emissions
AGG1	Aggregate Stockpile	-	-	-	1.50	-	Volume	(310910.72, 5098725.04)	Particulate Matter	n/a - PM	2.07E-01	24	EF	AADQ	13%
									PM10	14808-60-7	3.24E-04	24	EF	AADQ	2%
AGG2	Aggregate Stockpile	-	-	-	1.50	-	Volume	(310924.08, 5098705.34)	Particulate Matter	n/a - PM	2.07E-01	24	EF	AADQ	13%
									PM10	14808-60-7	3.24E-04	24	EF	AADQ	2%
SAN1	Sand Stockpile	-	-	-	1.50	-	Volume	(310886.67, 5098688.50)	Particulate Matter	n/a - PM	2.90E-01	24	EF	AADQ	18%
									PM10	14808-60-7	4.40E-03	24	EF	AADQ	26%
BIN1	Storage Bins / Hopper	-	-	-	4.90	-	Volume	(310868.39, 5098694.78)	Particulate Matter	n/a - PM	5.87E-01	24	EF	AADQ	37%
									PM10	14808-60-7	4.10E-03	24	EF	AADQ	24%
									Nitrogen Oxide	10102-44-0	9.13E-02	1, 24	EF	PDQ	100%
CON1	Flying Weighing System & Conveyor	-	-	-	3.00	-	Volume	(310868.39, 5098694.78)	Particulate Matter	n/a - PM	4.16E-03	24	EF	BADQ	0%
									PM10	14808-60-7	1.62E-05	24	EF	BADQ	<0.1%
SC1	Elevated Scale	-	-	-	8.45	-	Volume	(310853.50, 5098716.97)	Particulate Matter	n/a - PM	4.16E-03	24	EF	BADQ	0%
									PM10	14808-60-7	1.62E-05	24	EF	BADQ	<0.1%
LP1	Loading Point	-	-	-	4.20	-	Volume	(310853.50, 5098716.97)	Particulate Matter	n/a - PM	2.75E-01	24	EF	PDQ	17%
									PM10	14808-60-7	3.45E-03	24	EF	PDQ	20%
									Arsenic	7440-38-2	3.03E-05	24	EF	PDQ	93%
									Beryllium	7440-41-7	6.07E-07	24	EF	PDQ	83%
									Cadmium	7440-43-9	8.51E-08	24	EF	PDQ	74%
									Chromium (metallic, di and trivalent)	7440-47-3	2.84E-05	24	EF	PDQ	93%
									Lead (and its compounds)	7439-92-1	9.01E-06	24, 30 days	EF	PDQ	92%
									Manganese (and its compounds)	7439-96-5	1.52E-04	24	EF	PDQ	94%
									Nickel (and its compounds)	7440-02-0	2.98E-05	Annual	EF	PDQ	89%
									Total Phosphorus	7723-14-0	9.56E-05	24	EF	PDQ	92%
									Selenium	7782-49-2	6.52E-06	24	EF	PDQ	98%
									Silicate, portland cement	65997-15-1	2.07E-01	24	EF	AADQ	89%
DC1	Mixer Dust Collector	0.04	Amb	0.27	8.30	-	Vertical/Capped	(310857.35, 5098718.32)	Particulate Matter	n/a - PM	3.87E-03	24	EF	BADQ/PDQ	0%
									PM10	14808-60-7	2.13E-03	24	EF	BADQ/PDQ	13%
									Arsenic	7440-38-2	7.37E-07	24	EF	PDQ	2%
									Cadmium	7440-43-9	1.77E-09	24	EF	PDQ	2%
									Chromium (metallic, di and trivalent)	7440-47-3	3.16E-07	24	EF	PDQ	1%
									Lead (and its compounds)	7439-92-1	9.11E-08	24, 30 days	EF	PDQ	1%
									Manganese (and its compounds)	7439-96-5	9.41E-06	24	EF	PDQ	6%
									Nickel (and its compounds)	7440-02-0	6.17E-07	Annual	EF	PDQ	2%
									Total Phosphorus	7723-14-0	3.01E-06	24	EF	PDQ	3%
									Silicate, portland cement	65997-15-1	2.13E-03	24	EF	AADQ	1%
BH1	Baghouse	0.42	Amb	0.78	12.35	-	Vertical/Capped	(310862.28, 5098726.83)	Particulate Matter	n/a - PM	8.31E-03	24	EF	AADQ	1%
									PM10	14808-60-7	8.31E-06	24	EF	AADQ	<0.1%
									Arsenic	7440-38-2	7.36E-09	24	EF	PDQ	<0.1%
									Beryllium	7440-41-7	8.44E-10	24	EF	PDQ	0%
									Chromium (metallic, di and trivalent)	7440-47-3	5.03E-08	24	EF	PDQ	0%
									Lead (and its compounds)	7439-92-1	1.90E-08	24, 30 days	EF	PDQ	0%
									Manganese (and its compounds)	7439-96-5	2.04E-07	24	EF	PDQ	0%
									Nickel (and its compounds)	7440-02-0	7.26E-08	Annual	EF	PDQ	0%
									Silicate, portland cement	65997-15-1	6.23E-03	24	EF	AADQ	3%

Table 2. Source Summary Table

Source ID	Source Description	Source Data							Emission Data							
		Flow Rate (m^3/s)	Exit Gas Temp (°C)	Inner Dia (m)	Height Above Grade (m)	Height Above Roof (m)	Discharge Type	Source Location (x,y)	Contaminant	CAS #	Maximum Emission Rate (g/s)	Avg. Period (h)	Emission Estimating Technique	Emissions Data Quality	% of Overall Emissions
BH2	Baghouse	0.42	Amb	0.78	12.35	-	Vertical/Capped	(310864.63, 5098723.36)	Particulate Matter	n/a - PM	8.31E-03	24	EF	AADQ	1%
									PM10	14808-60-7	8.31E-06	24	EF	AADQ	<0.1%
									Arsenic	7440-38-2	6.97E-07	24	EF	PDQ	2%
									Beryllium	7440-41-7	6.28E-08	24	EF	PDQ	9%
									Cadmium	7440-43-9	1.38E-08	24	EF	PDQ	12%
									Chromium (metallic, di and trivalent)	7440-47-3	8.47E-07	24	EF	PDQ	3%
									Lead (and its compounds)	7439-92-1	3.61E-07	24, 30 days	EF	PDQ	4%
									Manganese (and its compounds)	7439-96-5	1.78E-07	24	EF	PDQ	0%
									Nickel (and its compounds)	7440-02-0	1.58E-06	Annual	EF	PDQ	5%
									Total Phosphorus	7723-14-0	2.46E-06	24	EF	PDQ	2%
									Selenium	7782-49-2	5.03E-08	24	EF	PDQ	1%
									Silicate, portland cement	65997-15-1	8.31E-03	24	EF	AADQ	4%
BH3	Baghouse	0.42	Amb	0.78	12.35	-	Vertical/Capped	(310867.32, 5098719.87)	Particulate Matter	n/a - PM	8.31E-03	24	EF	AADQ	1%
									PM10	14808-60-7	2.08E-03	24	EF	AADQ	12%
									Arsenic	7440-38-2	6.97E-07	24	EF	PDQ	2%
									Beryllium	7440-41-7	6.28E-08	24	EF	PDQ	9%
									Cadmium	7440-43-9	1.38E-08	24	EF	PDQ	12%
									Chromium (metallic, di and trivalent)	7440-47-3	8.47E-07	24	EF	PDQ	3%
									Lead (and its compounds)	7439-92-1	3.61E-07	24, 30 days	EF	PDQ	4%
									Manganese (and its compounds)	7439-96-5	1.78E-07	24	EF	PDQ	0%
									Nickel (and its compounds)	7440-02-0	1.58E-06	Annual	EF	PDQ	5%
									Total Phosphorus	7723-14-0	2.46E-06	24	EF	PDQ	2%
									Selenium	7782-49-2	5.03E-08	24	EF	PDQ	1%
									Silicate, portland cement	65997-15-1	8.31E-03	24	EF	AADQ	4%
-	Standy Power Diesel Generator	-	-	-	-	-	-	-	Insignificant Emissions	-	-	-	-	-	-	-

Table 3. Dispersion Modelling Input Summary Table

Relevant Section of the Regulation	Section Title	Description of How the Approved Dispersion Model was Used
Section 8	Negligible Sources	See Section 3 of this ESDM Report
Section 9	Same Structure Contamination	Not Applicable
Section 10	Operating Conditions	See Section 4.1 of this ESDM Report
Section 11	Source of Contaminant Emission Rates	See Section 4.2 of this ESDM Report.
Section 12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	Not Applicable
Section 13	Meteorological Conditions	MECP Regional Meteorological dataset for Eastern Forest (FOREST). Updated regional meteorological datasets processed with AERMET 19191 were used for modelling with AERMOD version 19191.
Section 14	Area of Modelling Coverage	Grid spacing as per ADMGO
Section 15	Stack Height for Certain New Sources of Contaminant	Not Applicable
Section 16	Terrain Data	MECP terrain files for Chalk River (031F and 031K) were used.
Section 17	Averaging Periods	1-hr, 24-hr, 30-days, Annual

Table 4. Emission Summary Table

Contaminant	CAS #	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m³)	Averaging Period (h)	MECP POI Limit (µg/m³)	Limiting Effect	Reg. Sch. No.	% of MOE POI Limit
Arsenic	7440-38-2	3.24E-05	AERMOD	4.49E-03	24	0.3	Health	G	1%
Beryllium	7440-41-7	7.34E-07	AERMOD	9.78E-05	24	0.01	Health	3	1%
Cadmium	7440-43-9	1.14E-07	AERMOD	1.60E-05	24	0.025	Health	3	0%
				1.60E-05	24	0.25	-	URT	<0.01%
Chromium (metallic, di and trivalent)	7440-47-3	3.05E-05	AERMOD	4.10E-03	24	0.5	Health	3	1%
				4.10E-03	24	5	-	URT	0%
Lead (and its compounds)	7439-92-1	9.84E-06	AERMOD	1.32E-03	24	0.5	Health	3	0%
				1.32E-03	24	2	-	URT	0%
				6.51E-04	30 days	0.2	Health	3	0%
Manganese (and its compounds)	7439-96-5	1.62E-04	AERMOD	2.41E-02	24	0.4	Health	3	6%
				2.41E-02	24	4	-	URT	1%
Nickel (and its compounds)	7440-02-0	3.37E-05	AERMOD	4.64E-03	24	2	-	URT	0%
				4.64E-03	24	2	-	DAV	0%
				1.38E-03	Annual	0.04	Health	3	3%
				1.38E-03	Annual	0.4	-	AAV	0%
Nitrogen Oxide	10102-44-0	9.13E-02	AERMOD	9.35E-01	1	400	Health	3	79%
				4.17E-01	24	200	Health	3	69%
Particulate Matter	n/a - PM	1.60E+00	AERMOD	4.70E+01	24	120	Visibility	3	39%
PM10	14808-60-7	1.69E-02	AERMOD	1.72E+00	24	5	Health	G	34%
Selenium	7782-49-2	6.62E-06	AERMOD	8.64E-04	24	10	Health	G	<0.01%
Silicate, portland cement	65997-15-1	2.32E-01	AERMOD	3.14E+01	24	90	Health	SL-MD	35%
Total Phosphorus	7723-14-0	1.03E-04	AERMOD	1.45E-02	24	0.5	Health	SL-MD	3%

3 = Schedule 3 of Reg. 419
G = Guideline Value
DAV = Daily Assessment Value
AAV = Annual Assessment Value
URT = Upper Risk Threshold
SL-JSL = Screening Level - Jurisdictional Screening Level
SL-PA = Screening Level - Previously Accepted
SL-MD = Screening Level - Ministry Derived

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FIGURES

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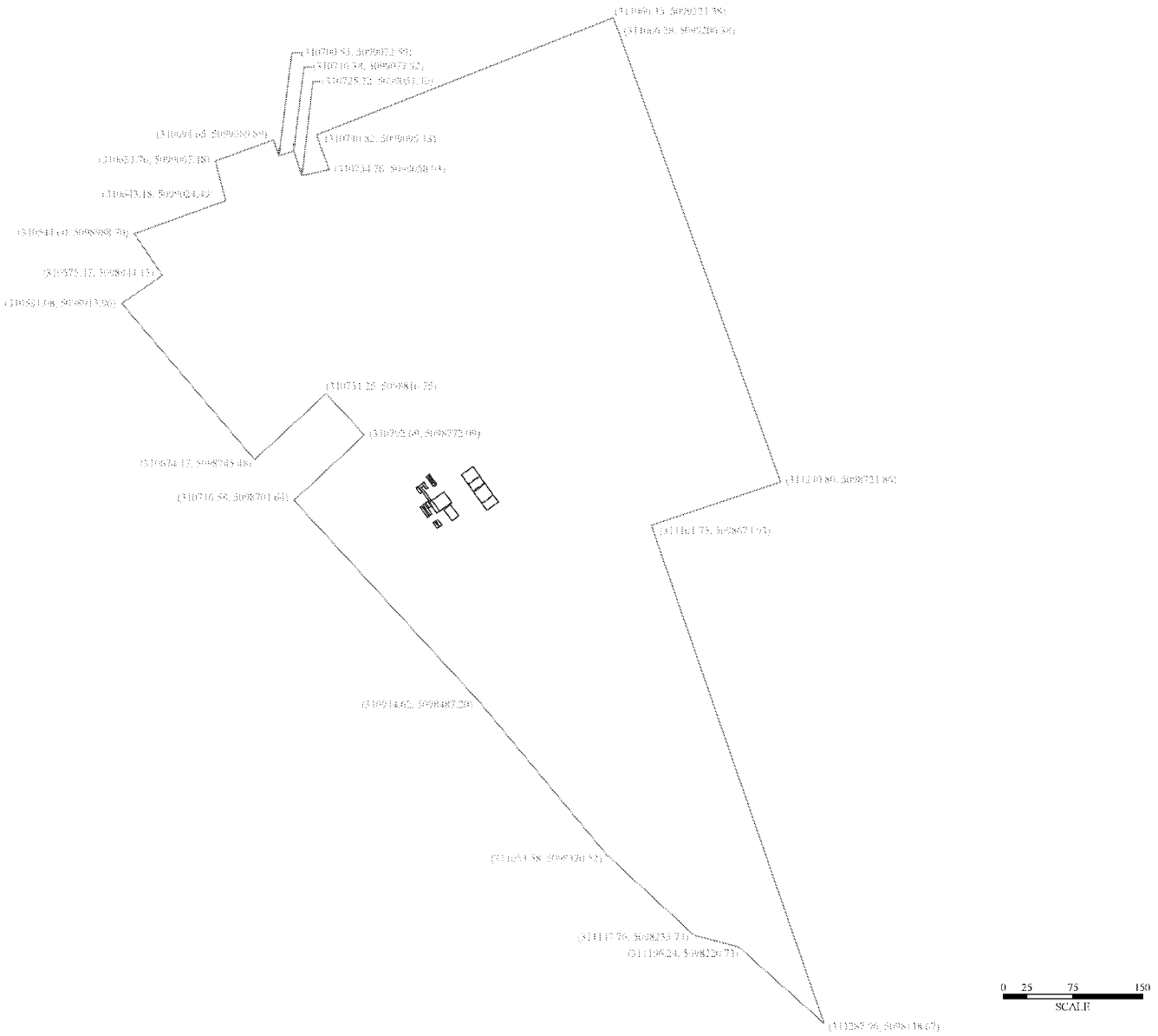
17

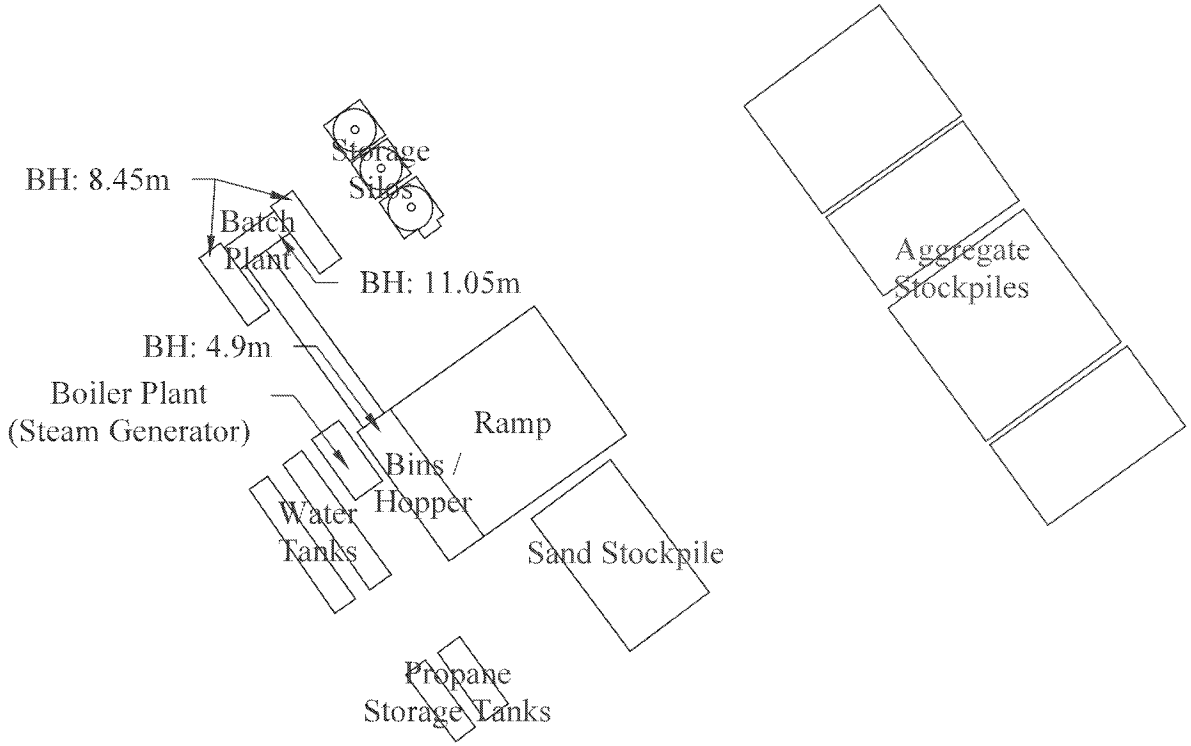
of the Freedom of Information and Protection of Privacy Act

de la Freedom of Information and Protection of Privacy Act



SONAIR ENVIRONMENTAL

ADDRESS:	DRAWN BY:	CHECKED BY:	CLIENT'S NAME:	CLIENT'S ADDRESS:	SCALE:
PO BOX 56702 PINE VALLEY PO VAUGHAN, ON L4L 8V3	BAS	TL	Bird Construction Industrial Services Ltd.	400-5700 Explorer Drive Mississauga. ON L4W 0C6	As shown
SE#:	**DATE:**	**DRAWING NAME:**	**REVISION #:**	**NOTES:**	
1185.001	2023-01-17	Site Layout	0	Site at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River	

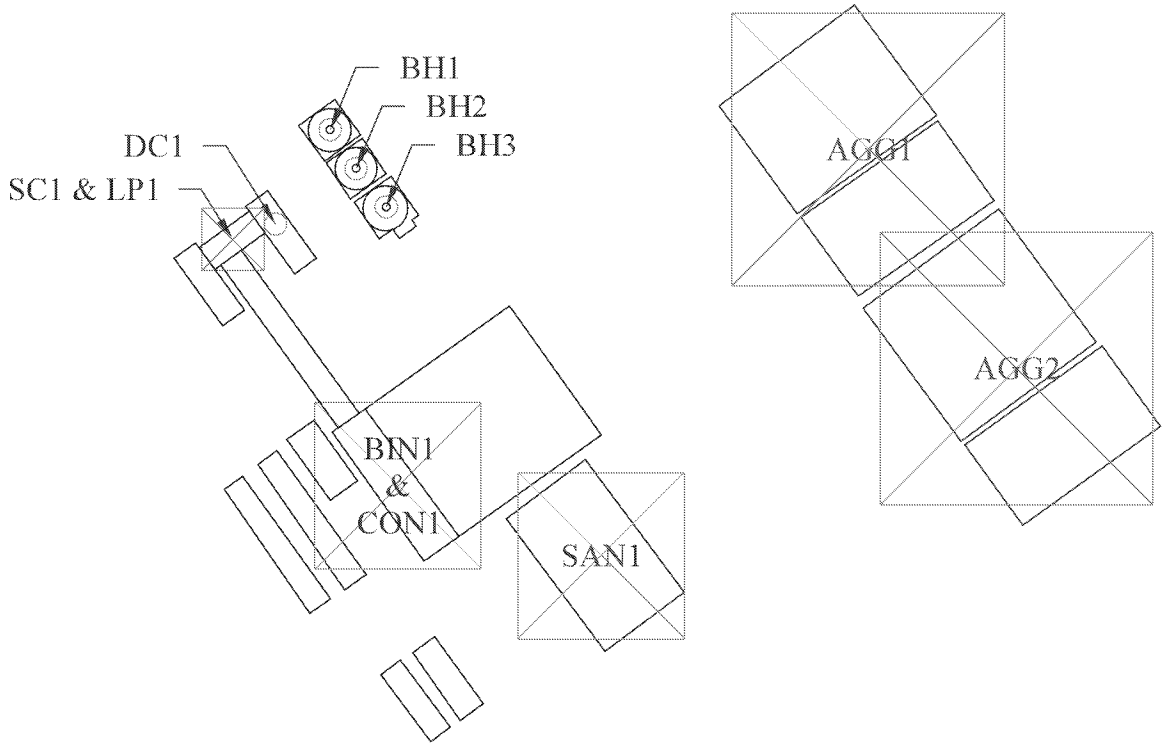


SONAIR ENVIRONMENTAL

0 5 15 30
SCALE

N

ADDRESS: PO BOX 56702 PINE VALLEY PO VAUGHAN, ON L4L 8V3	DRAWN BY: BAS	CHECKED BY: TL	CLIENT'S NAME: Bird Construction Industrial Services Ltd.	CLIENT'S ADDRESS: 400-5700 Explorer Drive Mississauga. ON L4W 0C6	SCALE: As shown
SE#: 1185.001	DATE: 2023-01-17	DRAWING NAME: Plant Layout	REVISION #: 0	NOTES: Site at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River	

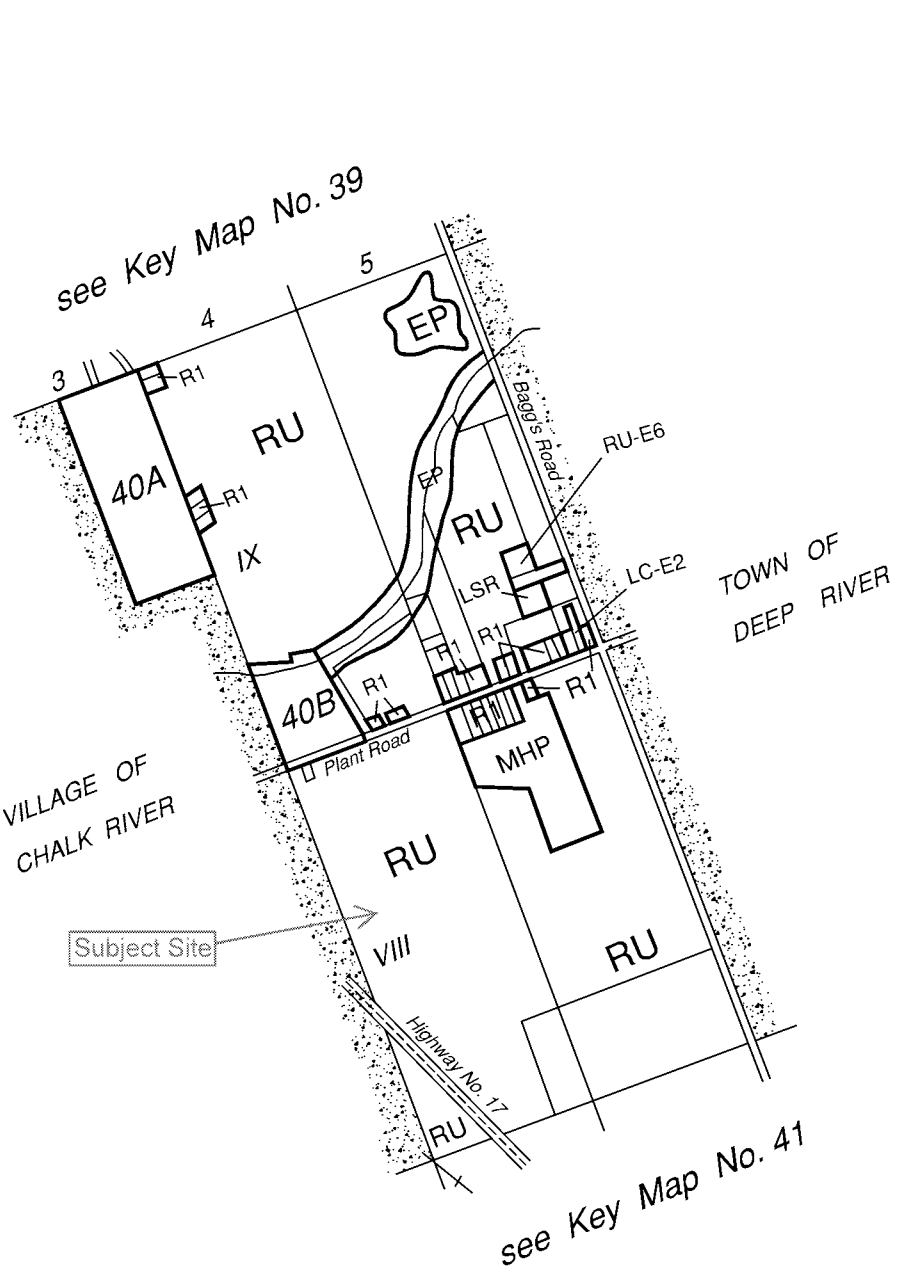


SONAIR ENVIRONMENTAL

0 5 15 30
SCALE

N

ADDRESS:	DRAWN BY:	CHECKED BY:	CLIENT'S NAME:	CLIENT'S ADDRESS:	SCALE:
PO BOX 56702 PINE VALLEY PO VAUGHAN, ON L4L 8V3	BAS	TL	Bird Construction Industrial Services Ltd.	400-5700 Explorer Drive Mississauga. ON L4W 0C6	As shown
SE#:	DATE:	DRAWING NAME:	REVISION #:	NOTES:	
1185.001	2023-01-17	Modelled Source Location	0	Site at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River	



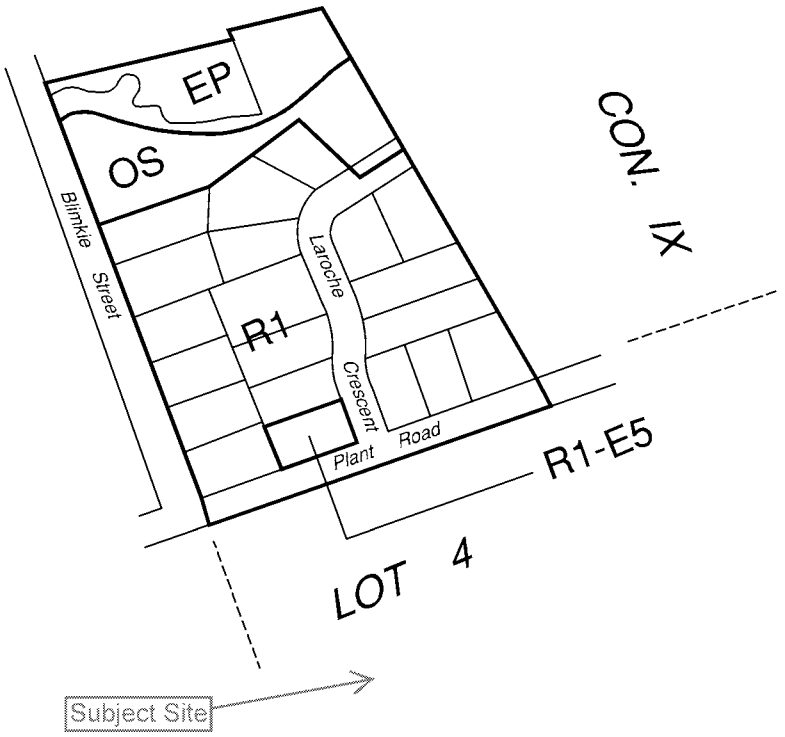
SCALE

0 0.5 1.0 km.

SCHEDULE "40"
THE TOWN OF
LAURENTIAN HILLS
ZONING BY - LAW

Key Map No. 40

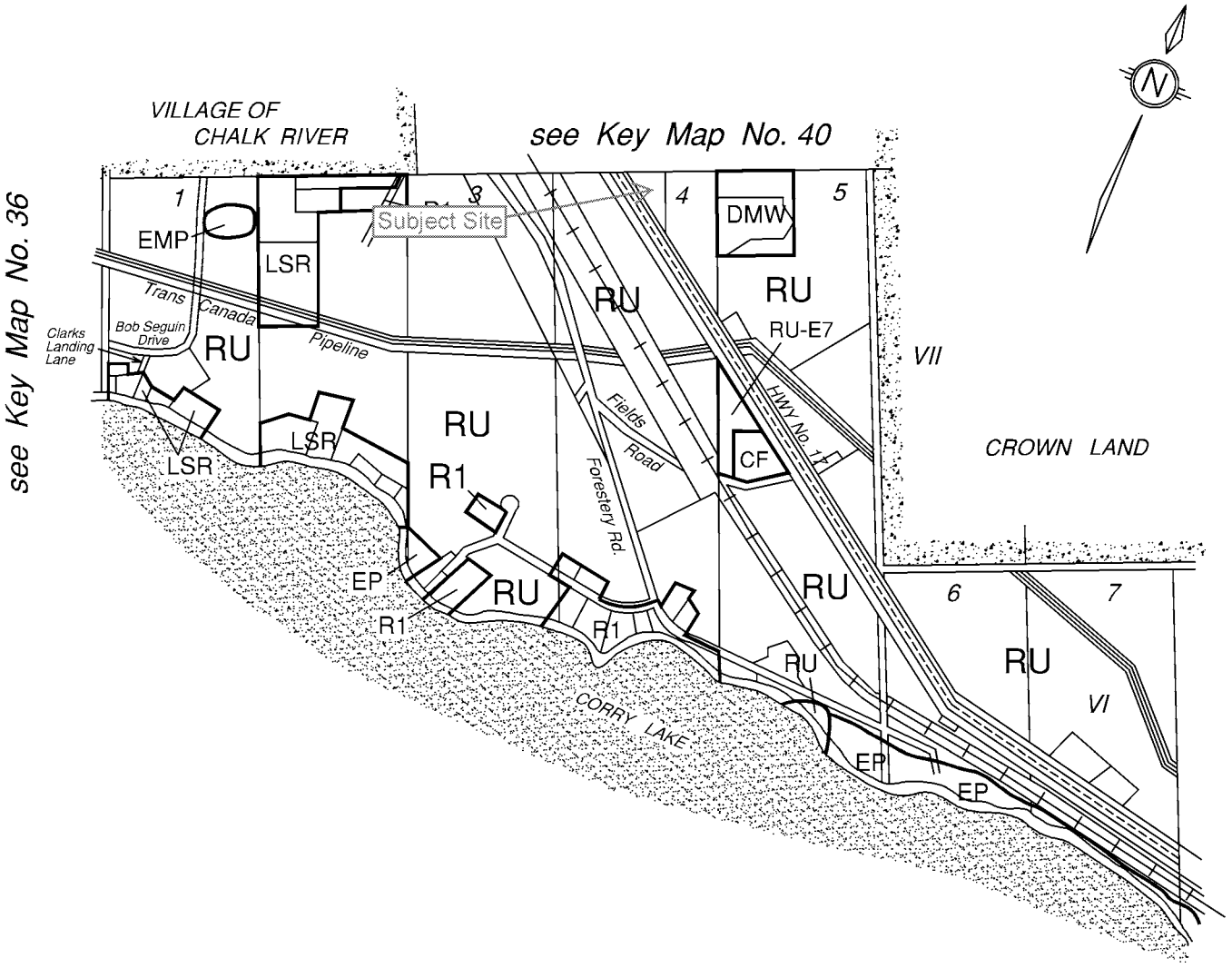
000085



SCALE
0 125 250 Metres

SCHEDULE "40B"
THE TOWN OF
LAURENTIAN HILLS
ZONING BY - LAW

Key Map No. 40B



SCALE

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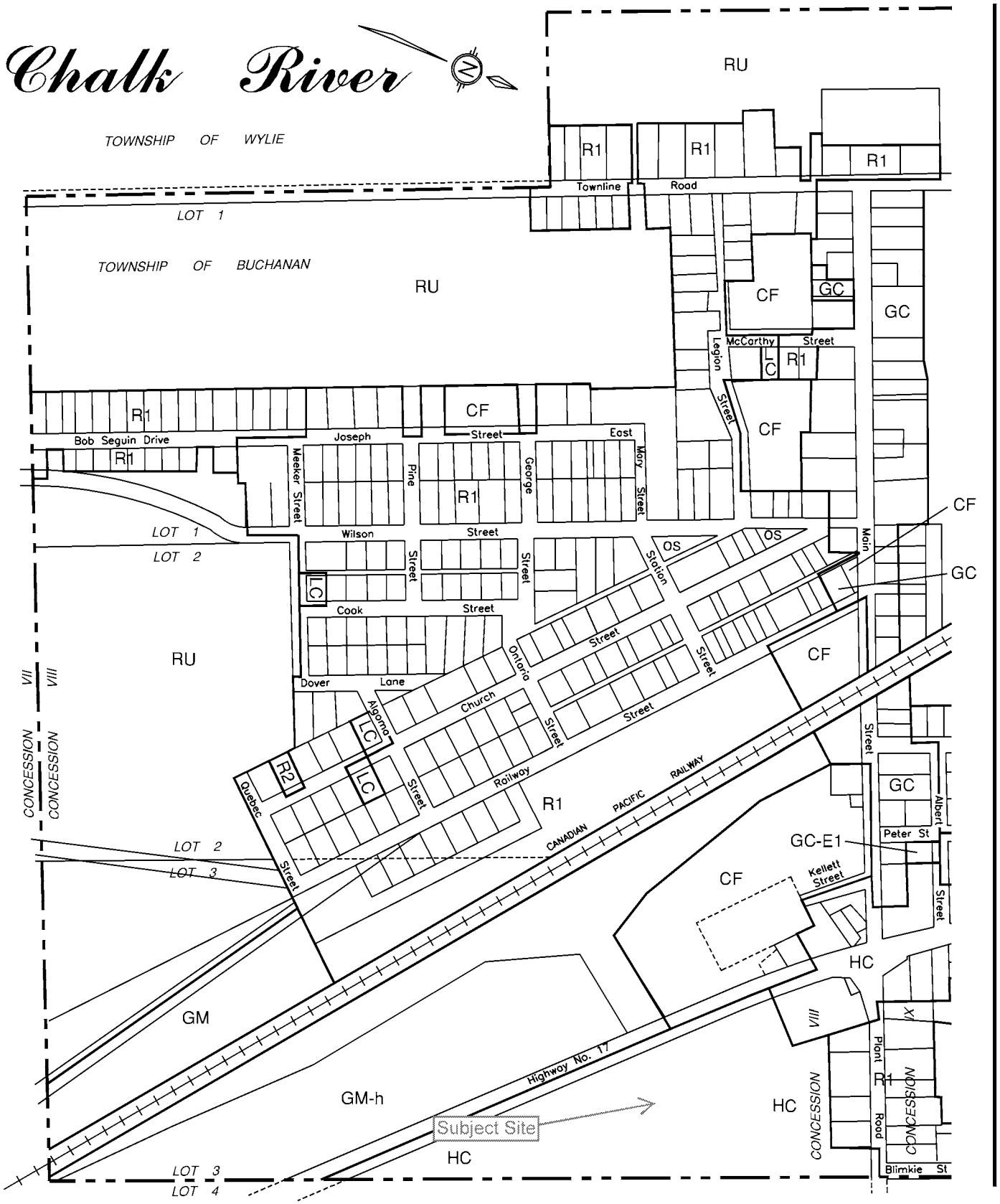
SCHEDULE "41"
THE TOWN OF
LAURENTIAN HILLS
ZONING BY - LAW

Key Map No. 41

000087



SCALE

100 50 0 100 200 300 Metres

SCHEDULE "46"
THE TOWN OF
LAURENTIAN HILLS
ZONING BY - LAW

Key Map No. 46

000088

5.9 HIGHWAY COMMERCIAL ZONE - HC

No person shall use any land or erect, alter or use any building or structure in the Highway Commercial zone (HC) except in accordance with the provisions of this Section and of any other relevant Sections of this By-law.

5.9.1 Permitted Uses

- Automotive Body Shop*
- Automotive Service Station* (see **Section 4.2**)
- Automotive Repair Garage*
- Automotive Sales Establishment*
- Building Supply Store
- Car Rental Establishment*
- Car Washing Establishment* (see **Section 4.2)**
- Clinic
- Commercial Greenhouse
- Construction Yard or Contractor's Yard
- Convenience Store
- Day Nursery (see **Section 4.9**)
- Drive-Through Facility (see **Section 4.10**)
- Equipment Rental Establishment
- Flea Market
- Funeral Parlour
- Furniture Showroom and Workshop
- Garden Centre
- Gasoline Bar* (see **Section 4.2**)
- Gasoline Card Lock Facility*
- Home Display and Sales Outlet
- Hotel
- Kennel
- Mini Warehouse and Public Storage
- Motel
- Office
- Park
- Parking Lot - Commercial
- Personal Service Establishment
- Place of Amusement
- Printing and Publishing Establishment
- Private Club
- Public Service Use (see **Section 4.40**)
- Public Utility (see **Section 4.40**)
- Recreational Commercial Establishment
- Recreational Vehicle Sales and Storage*
- Restaurant
- Retail Outlet
- Service Outlet
- Studio
- Tavern or Road House
- Tourist Establishment
- Transportation Depot*
- Veterinary Establishment [see **Section 4.25 (g)**]
- Warehouse
- Workshop or Custom Workshop

Accessory Uses, Buildings and Structures (see **Section 4.1**)

- Accessory Dwelling
- Accessory Dwelling Unit
- Home Industry (see **Section 4.19)**
- Home Occupation (see **Section 4.20)**

5.19 RURAL ZONE - RU

No person shall use any land or erect, alter or use any building or structure in the Rural zone (RU) except in accordance with the provisions of this Section and of any other relevant Sections of this By-law.

5.19.1 Permitted Uses

- Agricultural Use (farm) [see **Section 4.25 (e)**]
- Camp
-
- Cemetery
- Commercial Greenhouse
- Dwelling - Duplex
- Dwelling - Seasonal
- Dwelling - Semi-detached
- Dwelling - Single Detached
- Equestrian Establishment (Minimum Lot Area 2 ha [5 ac])
- Farm Produce Outlet
- Forestry Uses
- Group Home (see **Section 4.17**)
- Log Hauling Operation
- Marine Facility
- Park
- Parking Area
- Portable Asphalt/Concrete Plant
- Private Club
- Public Service Use (see **Section 4.40**)
- Public Utility (see **Section 4.40**)
- Wayside Quarry
- Wayside Pit

Accessory Uses, Buildings and Structures (see **Section 4.1**)

- Accessory Dwelling
- Bed and Breakfast
- Home Industry (see **Section 4.19**)
- Home Occupation (see **Section 4.20**)
- Sleep Cabin (see **Section 4.37**)

5.19.2 Zone Requirements

APPENDIX A

INSIGNIFICANT SOURCES/CONTAMINANTS

Table 1-1. Insignificant Sources/Contaminants

Processing Area / Equipment	Insignificant	
	Contaminant	Source
Stanby Power Diesel Generator	Nox	-

APPENDIX B

EMISSION ESTIMATES

Summary of Air Emissions from Material Transfer

Source ID: SP1, SP2, LP1, LP2, BH1
Description: - The plant has a total of two (3) general outdoor stockpiles, consisting of aggregate and sand, and three (3) storage silos equipped with dust collectors to store cement and cementitious materials.

Emission Methodology

Hours of operation =	24	hr/day
Silo Baghouse Flow Rate =	0.42	m3/s
Mixer Dust Collector Flow Rate =	0.04	m3/s
Maximum Daily Production Rate of Truck Mix RMC Plant =	800	m3/day
Maximum Daily Volume Rate of Unwashed Material =	739.3	m3/day
Quantity of Aggregate in Concrete =	1061	kg/m3
Quantity of Sand in Concrete =	707	kg/m3
Quantity of Cementitious Material in Concrete =	430	kg/m3

Emission Methodology

Material Transfer		Contaminant	CAS #	Weight Percent (%)	Moisture Content (M) (%)	Wind Speed (U) (m/s)	Emission Factor (kg/tonne)	Control Efficiency (%)	Maximum Loading Rate (tonne/day)	% Crystalline Silica (quartz) in PM10	Maximum Emission Rate (g/s)
From	To										
Aggregate											
Delivery truck	Stockpile #1	Particulate Matter	n/a - PM	-	0.25	3.23	3.59E-02	0%	500.0	-	2.07E-01
		PM10	14808-60-7				1.70E-02			0.33%	3.24E-04
Delivery truck	Stockpile #2	Particulate Matter	n/a - PM	-	0.25	3.23	3.59E-02	0%	500.0	-	2.07E-01
		PM10	14808-60-7				1.70E-02			0.33%	3.24E-04
Stockpiles	Bins	Particulate Matter	n/a - PM	-	0.25	3.23	3.59E-02	0%	848.8	-	3.52E-01
		PM10	14808-60-7				1.70E-02			0.33%	5.50E-04
Bins	Conveyor	Particulate Matter	n/a - PM	-	-	-	3.50E-03	90%	848.8	-	3.44E-03
		PM10	14808-60-7				1.70E-03			0.33%	5.51E-06
Conveyor	Elevated Scale	Particulate Matter	n/a - PM				3.50E-03	90%	848.8	-	3.44E-03
		PM10	14808-60-7				1.70E-03			0.33%	5.51E-06
Elevated Scale	Mixer	Particulate Matter	n/a - PM				-	-	-	-	7.74E-04
		PM10	14808-60-7				-			0.33%	2.55E-06
Mixer	Truck Loading	Particulate Matter	n/a - PM				3.50E-03	25%	848.8	-	2.58E-02
		PM10	14808-60-7				1.70E-03			0.33%	4.13E-05
Sand											
Delivery truck	Stockpile	Particulate Matter	n/a - PM	-	0.25	3.23	3.59E-02	0%	700.0	-	2.90E-01
		PM10	14808-60-7				1.70E-02			3.2%	4.40E-03
Stockpile	Bins	Particulate Matter	n/a - PM	-	0.25	3.23	3.59E-02	0%	565.6	-	2.35E-01
		PM10	14808-60-7				1.70E-02			3.2%	3.55E-03
Bins	Conveyor	Particulate Matter	n/a - PM	-	-	-	1.10E-03	90%	565.6	-	7.20E-04
		PM10	14808-60-7				5.10E-04			3.2%	1.07E-05
Conveyor	Elevated Scale	Particulate Matter	n/a - PM				1.10E-03	90%	565.6	-	7.20E-04
		PM10	14808-60-7				5.10E-04			3.2%	1.07E-05
Elevated Scale	Mixer	Particulate Matter	n/a - PM				-	-	-	-	7.74E-04
		PM10	14808-60-7				-			3.2%	2.48E-05
Mixer	Truck Loading	Particulate Matter	n/a - PM				1.10E-03	25%	565.6	-	5.40E-03
		PM10	14808-60-7				5.10E-04			3.2%	8.01E-05
Silo #1 - Cement Material											
Delivery Tanker Truck	Storage Silo #1	Particulate Matter	n/a - PM	-	-	-	-	-	-	-	8.31E-03
		PM10	14808-60-7				-		-	0.1%	8.31E-06
		Arsenic	7440-38-2				2.12E-09		300.0	-	7.36E-09
		Beryllium	7440-41-7				2.43E-10				8.44E-10
		Chromium (metallic, di and trivalent)	7440-47-3				1.45E-08				5.03E-08
		Lead (and its compounds)	7439-92-1				5.46E-09				1.90E-08
		Manganese (and its compounds)	7439-96-5				5.87E-08				2.04E-07
		Nickel (and its compounds)	7440-02-0				2.09E-08				7.26E-08
		Silicate, portland cement	65997-15-1	75%			-				6.23E-03

Summary of Air Emissions from Material Transfer

Storage Silo #1	Mixer	Particulate Matter	n/a - PM	-	-	-	-	-	-	-	7.74E-04
		PM10	14808-60-7				-	-	-	0.1%	8.31E-06
		Arsenic	7440-38-2				1.48E-07		258.0	-	4.42E-07
		Cadmium	7440-43-9				3.55E-10				1.06E-09
		Chromium (metallic, di and trivalent)	7440-47-3				6.34E-08				1.89E-07
		Lead (and its compounds)	7439-92-1				1.83E-08				5.46E-08
		Manganese (and its compounds)	7439-96-5				1.89E-06				5.64E-06
		Nickel (and its compounds)	7440-02-0				1.24E-07				3.70E-07
		Total Phosphorus	7723-14-0				6.04E-07				1.80E-06
		Silicate, portland cement	65997-15-1	75%			-				5.80E-04
Mixer	Truck Loading	Particulate Matter	n/a - PM	-	-	-	4.90E-02	-	258.0	-	1.46E-01
		PM10	14808-60-7				1.31E-02			0.1%	3.91E-05
		Arsenic	7440-38-2				6.09E-06			-	1.82E-05
		Beryllium	7440-41-7				1.22E-07				3.64E-07
		Cadmium	7440-43-9				1.71E-08				5.11E-08
		Chromium (metallic, di and trivalent)	7440-47-3				5.71E-06				1.71E-05
		Lead (and its compounds)	7439-92-1				1.81E-06				5.40E-06
		Manganese (and its compounds)	7439-96-5				3.06E-05				9.14E-05
		Nickel (and its compounds)	7440-02-0				5.99E-06				1.79E-05
		Total Phosphorus	7723-14-0				1.92E-05				5.73E-05
		Selenium	7782-49-2				1.31E-06				3.91E-06
		Silicate, portland cement	65997-15-1	75%			-				1.10E-01
Silo #2 - Cement Supplement (Slag)											
Delivery Tanker Truck	Storage Silo #2	Particulate Matter	n/a - PM	-	-	-	-	-	-	-	8.31E-03
		PM10	14808-60-7				-		-	0.1%	8.31E-06
		Arsenic	7440-38-2				5.02E-07		120.0	-	6.97E-07
		Beryllium	7440-41-7				4.52E-08				6.28E-08
		Cadmium	7440-43-9				9.92E-09				1.38E-08
		Chromium (metallic, di and trivalent)	7440-47-3				6.10E-07				8.47E-07
		Lead (and its compounds)	7439-92-1				2.60E-07				3.61E-07
		Manganese (and its compounds)	7439-96-5				1.28E-07				1.78E-07
		Nickel (and its compounds)	7440-02-0				1.14E-06				1.58E-06
		Total Phosphorus	7723-14-0				1.77E-06				2.46E-06
		Selenium	7782-49-2				3.62E-08				5.03E-08
		Silicate, portland cement	65997-15-1				-				8.31E-03
Storage Silo #2	Mixer	Particulate Matter	n/a - PM	-	-	-	-	-	-	-	7.74E-04
		PM10	14808-60-7				-		-	0.1%	8.31E-06
		Arsenic	7440-38-2				1.48E-07		86.0	-	1.47E-07
		Cadmium	7440-43-9				3.55E-10				3.53E-10
		Chromium (metallic, di and trivalent)	7440-47-3				6.34E-08				6.31E-08
		Lead (and its compounds)	7439-92-1				1.83E-08				1.82E-08
		Manganese (and its compounds)	7439-96-5				1.89E-06				1.88E-06
		Nickel (and its compounds)	7440-02-0				1.24E-07				1.23E-07
		Total Phosphorus	7723-14-0				6.04E-07				6.01E-07
		Silicate, portland cement	65997-15-1				-				7.74E-04
Mixer	Truck Loading	Particulate Matter	n/a - PM	-	-	-	4.90E-02	-	86.0	-	4.88E-02
		PM10	14808-60-7				1.31E-02			0.1%	1.30E-05
		Arsenic	7440-38-2				6.09E-06			-	6.06E-06
		Beryllium	7440-41-7				1.22E-07				1.21E-07
		Cadmium	7440-43-9				1.71E-08				1.70E-08
		Chromium (metallic, di and trivalent)	7440-47-3				5.71E-06				5.68E-06
		Lead (and its compounds)	7439-92-1				1.81E-06				1.80E-06
		Manganese (and its compounds)	7439-96-5				3.06E-05				3.05E-05
		Nickel (and its compounds)	7440-02-0				5.99E-06				5.96E-06
		Total Phosphorus	7723-14-0				1.92E-05				1.91E-05
		Selenium	7782-49-2				1.31E-06				1.30E-06
		Silicate, portland cement	65997-15-1				-				4.88E-02

Summary of Air Emissions from Material Transfer

Silo #3 - Cement Supplement (Silica Fume)											
Delivery Tanker Truck	Storage Silo #3	Particulate Matter	n/a - PM	-	-	-	-	-	-	-	8.31E-03
		PM10	14808-60-7				-		-	25.1%	2.08E-03
		Arsenic	7440-38-2				5.02E-07		120.0	-	6.97E-07
		Beryllium	7440-41-7				4.52E-08				6.28E-08
		Cadmium	7440-43-9				9.92E-09				1.38E-08
		Chromium (metallic, di and trivalent)	7440-47-3				6.10E-07				8.47E-07
		Lead (and its compounds)	7439-92-1				2.60E-07				3.61E-07
		Manganese (and its compounds)	7439-96-5				1.28E-07				1.78E-07
		Nickel (and its compounds)	7440-02-0				1.14E-06				1.58E-06
		Total Phosphorus	7723-14-0				1.77E-06				2.46E-06
		Selenium	7782-49-2				3.62E-08				5.03E-08
		Silicate, portland cement	65997-15-1				-				8.31E-03
Storage Silo #3	Mixer	Particulate Matter	n/a - PM	-	-	-	-	-	-	-	7.74E-04
		PM10	14808-60-7				-		-	25.1%	2.08E-03
		Arsenic	7440-38-2				1.48E-07		86.0	-	1.47E-07
		Cadmium	7440-43-9				3.55E-10				3.53E-10
		Chromium (metallic, di and trivalent)	7440-47-3				6.34E-08				6.31E-08
		Lead (and its compounds)	7439-92-1				1.83E-08				1.82E-08
		Manganese (and its compounds)	7439-96-5				1.89E-06				1.88E-06
		Nickel (and its compounds)	7440-02-0				1.24E-07				1.23E-07
		Total Phosphorus	7723-14-0				6.04E-07				6.01E-07
		Silicate, portland cement	65997-15-1				-				7.74E-04
Mixer	Truck Loading	Particulate Matter	n/a - PM	-	-	-	4.90E-02	-	86.0	-	4.88E-02
		PM10	14808-60-7				1.31E-02			25.1%	3.27E-03
		Arsenic	7440-38-2				6.09E-06			-	6.06E-06
		Beryllium	7440-41-7				1.22E-07				1.21E-07
		Cadmium	7440-43-9				1.71E-08				1.70E-08
		Chromium (metallic, di and trivalent)	7440-47-3				5.71E-06				5.68E-06
		Lead (and its compounds)	7439-92-1				1.81E-06				1.80E-06
		Manganese (and its compounds)	7439-96-5				3.06E-05				3.05E-05
		Nickel (and its compounds)	7440-02-0				5.99E-06				5.96E-06
		Total Phosphorus	7723-14-0				1.92E-05				1.91E-05
		Selenium	7782-49-2				1.31E-06				1.30E-06
		Silicate, portland cement	65997-15-1				-				4.88E-02

Sample Calculation

Delivery truck to Stockpile

Emission Factor = k(0.0016) [(U/2.22)^1.3]/[(M/2)^1.4]
= 0.74 (0.0016) [(3.23m/s/2.2)^1.3)]/[(0.25/2)^1.4]
= 3.59E-02 kg/tonne

k = 0.74 (TSP); k = 0.35 (PM10)

Particulate Matter Emission Rate = Emission Factor x Loading Rate x Control Efficiency x Operating Hours
= 3.59E-02 kg/tonne x 500 tonne/day x (1-0) x 1000 g/kg x day/24hr x hr/3600s x (7440-41-7hr/24hr)
= 2.07E-01 g/s

PM10 Emission Rate = Emission Factor x Loading Rate x %Crytalline Silica x Control Efficiency x Operating Hours
= 1.70E-02 kg/tonne x 500 tonne/day x 0.0033 x (1-0) x 1000 g/kg x day/24hr x hr/3600s x (24hr/24hr)
= 3.24E-04 g/s

Summary of Air Emissions from Material Transfer

Bins to Conveyor

Particulate Matter Emission Rate = Emission Factor x Loading Rate x Control Efficiency x Operating Hours
= 3.50E-03 kg/tonne x 848.8 tonne/day x (1-0.9) x 1000 g/kg x day/24hr x hr/3600s x (24hr/24hr)
= 3.44E-03 g/s

EF = 3.50E-03 (Aggregate); EF = 1.10E-03 (Sand)

PM10 Emission Rate = Emission Factor x Loading Rate x %Crytalline Silica x Control Efficiency x Operating Hours
= 1.70E-03 kg/tonne x 848.8 tonne/day x 0.0033 x (1-0.9) x 1000 g/kg x day/24hr x hr/3600s x (24hr/24hr)
= 5.51E-06 g/s

EF = 1.70E-03 (Aggregate); EF = 5.10E-04 (Sand)

Elevated Scale to Mixer

Particulate Matter Emission Rate = Dust Collector Flow Rate x Emission Factor x Operating Hours
= 0.04 m3/s x 20 mg/m3 x 1g/1000mg x (24hr/24hr)
= 7.74E-04 g/s

PM10 Emission Rate = Dust Collector Flow Rate x Emission Factor x %Crystalline Silica x Operating Hours
= 0.04 m3/s x 20 mg/m3 x 0.003 x 1g/1000mg x (24hr/24hr)
= 2.55E-06 g/s

Delivery Tanker Truck to Storage Silo #1

Particulate Matter Emission Rate = Baghouse Flow Rate x Emission Factor x Operating Hours
= 0.42 m3/s x 20 mg/m3 x 1g/1000mg x (24hr/24hr)
= 8.31E-03 g/s

PM10 Emission Rate = Baghouse Flow Rate x Emission Factor x %Crystalline Silica x Operating Hours
= 0.42 m3/s x 20 mg/m3 x 0.001 x 1g/1000mg x (24hr/24hr)
= 8.31E-06 g/s

Arsenic Emission Rate = Emission Factor x Loading Rate x Operating Hours
= 2.12E-09 kg/tonne x - tonne/day x 1000 g/kg x day/24hr x hr/3600s x (24hr/24hr)
= 7.36E-09 g/s

Silicate, Portland Cement Emission Rate = Particulate Matter Emission Rate x Weight Percent
= 8.31E-03 g/s x 0.75
= 6.23E-03 g/s

Storage Silo #1 to Truck Loading

Particulate Matter Emission Rate = Emission Factor x Loading Rate x Operating Hours
= 4.90E-02 kg/tonne x 258 tonne/day x 1000 g/kg x day/24hr x hr/3600s x (24hr/24hr)
= 1.46E-01 g/s

PM10 Emission Rate = Flow Rate x Emission Factor x Operating Hours x %Crystalline Silica x Operating Hours
= 0.42 m3/s x 20 mg/m3 x 0.00 x 1g/1000mg x (24hr/24hr)
= 3.91E-05 g/s

Arsenic Emission Rate = Emission Factor x Loading Rate x Operating Hours
= 6.09E-06 kg/tonne x 258 tonne/day x 1000 g/kg x day/24hr x hr/3600s x (24hr/24hr)
= 1.82E-05 g/s

Summary of Air Emissions from Material Transfer

Process Emissions Summary

Material Transfer		Source ID	Contaminant	CAS #	Maximum Emission Rate (g/s)	Emission Estimation Technique	Data Quality
From	To						
Aggregate							
Delivery truck	Stockpile #1	AGG1	Particulate Matter	n/a - PM	2.07E-01	EF	AADQ
			PM10	14808-60-7	3.24E-04	EF	AADQ
Delivery truck	Stockpile #2	AGG2	Particulate Matter	n/a - PM	2.07E-01	EF	AADQ
			PM10	14808-60-7	3.24E-04	EF	AADQ
Stockpiles	Bins	BIN1	Particulate Matter	n/a - PM	3.52E-01	EF	AADQ
			PM10	14808-60-7	5.50E-04	EF	AADQ
Bins	Conveyor	CON1	Particulate Matter	n/a - PM	3.44E-03	EF	BADQ
			PM10	14808-60-7	5.51E-06	EF	BADQ
Conveyor	Elevated Scale	SC1	Particulate Matter	n/a - PM	3.44E-03	EF	BADQ
			PM10	14808-60-7	5.51E-06	EF	BADQ
Elevated Scale	Mixer	DC1	Particulate Matter	n/a - PM	7.74E-04	EF	BADQ
			PM10	14808-60-7	2.55E-06	EF	BADQ
Mixer	Truck Loading	LP1	Particulate Matter	n/a - PM	2.58E-02	EF	BADQ
			PM10	14808-60-7	4.13E-05	EF	BADQ
Sand							
Delivery truck	Stockpile	SAN1	Particulate Matter	n/a - PM	2.90E-01	EF	AADQ
			PM10	14808-60-7	4.40E-03	EF	AADQ
Stockpile	Bins	BIN1	Particulate Matter	n/a - PM	2.35E-01	EF	AADQ
			PM10	14808-60-7	3.55E-03	EF	AADQ
Bins	Conveyor	CON1	Particulate Matter	n/a - PM	7.20E-04	EF	BADQ
			PM10	14808-60-7	1.07E-05	EF	BADQ
Conveyor	Elevated Scale	SC1	Particulate Matter	n/a - PM	7.20E-04	EF	BADQ
			PM10	14808-60-7	1.07E-05	EF	BADQ
Elevated Scale	Mixer	DC1	Particulate Matter	n/a - PM	7.74E-04	EF	BADQ
			PM10	14808-60-7	2.48E-05	EF	BADQ
Mixer	Truck Loading	LP1	Particulate Matter	n/a - PM	5.40E-03	EF	BADQ
			PM10	14808-60-7	8.01E-05	EF	BADQ
Silo #1 - Cement Material							
Delivery Tanker Truck	Storage Silo #1	BH1	Particulate Matter	n/a - PM	8.31E-03	EF	AADQ
			PM10	14808-60-7	8.31E-06	EF	AADQ
			Arsenic	7440-38-2	7.36E-09	EF	PDQ
			Beryllium	7440-41-7	8.44E-10	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	5.03E-08	EF	PDQ
			Lead (and its compounds)	7439-92-1	1.90E-08	EF	PDQ
			Manganese (and its compounds)	7439-96-5	2.04E-07	EF	PDQ
			Nickel (and its compounds)	7440-02-0	7.26E-08	EF	PDQ
			Silicate, portland cement	65997-15-1	6.23E-03	EF	AADQ
Storage Silo #1	Mixer	DC1	Particulate Matter	n/a - PM	7.74E-04	EF	PDQ
			PM10	14808-60-7	8.31E-06	EF	PDQ
			Arsenic	7440-38-2	4.42E-07	EF	PDQ
			Cadmium	7440-43-9	1.06E-09	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	1.89E-07	EF	PDQ
			Lead (and its compounds)	7439-92-1	5.46E-08	EF	PDQ
			Manganese (and its compounds)	7439-96-5	5.64E-06	EF	PDQ
			Nickel (and its compounds)	7440-02-0	3.70E-07	EF	PDQ
			Total Phosphorus	7723-14-0	1.80E-06	EF	PDQ
			Silicate, portland cement	65997-15-1	5.80E-04	EF	AADQ

Summary of Air Emissions from Material Transfer

Mixer	Truck Loading	LP1	Particulate Matter	n/a - PM	1.46E-01	EF	PDQ
			PM10	14808-60-7	3.91E-05	EF	PDQ
			Arsenic	7440-38-2	1.82E-05	EF	PDQ
			Beryllium	7440-41-7	3.64E-07	EF	PDQ
			Cadmium	7440-43-9	5.11E-08	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	1.71E-05	EF	PDQ
			Lead (and its compounds)	7439-92-1	5.40E-06	EF	PDQ
			Manganese (and its compounds)	7439-96-5	9.14E-05	EF	PDQ
			Nickel (and its compounds)	7440-02-0	1.79E-05	EF	PDQ
			Total Phosphorus	7723-14-0	5.73E-05	EF	PDQ
			Selenium	7782-49-2	3.91E-06	EF	PDQ
			Silicate, portland cement	65997-15-1	1.10E-01	EF	AADQ
Silo #2 - Cement Supplement (Slag)							
Delivery Tanker Truck	Storage Silo #2	BH2	Particulate Matter	n/a - PM	8.31E-03	EF	AADQ
			PM10	14808-60-7	8.31E-06	EF	AADQ
			Arsenic	7440-38-2	6.97E-07	EF	PDQ
			Beryllium	7440-41-7	6.28E-08	EF	PDQ
			Cadmium	7440-43-9	1.38E-08	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	8.47E-07	EF	PDQ
			Lead (and its compounds)	7439-92-1	3.61E-07	EF	PDQ
			Manganese (and its compounds)	7439-96-5	1.78E-07	EF	PDQ
			Nickel (and its compounds)	7440-02-0	1.58E-06	EF	PDQ
			Total Phosphorus	7723-14-0	2.46E-06	EF	PDQ
			Selenium	7782-49-2	5.03E-08	EF	PDQ
			Silicate, portland cement	65997-15-1	8.31E-03	EF	AADQ
Storage Silo #2	Mixer	DC1	Particulate Matter	n/a - PM	7.74E-04	EF	PDQ
			PM10	14808-60-7	8.31E-06	EF	PDQ
			Arsenic	7440-38-2	1.47E-07	EF	PDQ
			Cadmium	7440-43-9	3.53E-10	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	6.31E-08	EF	PDQ
			Lead (and its compounds)	7439-92-1	1.82E-08	EF	PDQ
			Manganese (and its compounds)	7439-96-5	1.88E-06	EF	PDQ
			Nickel (and its compounds)	7440-02-0	1.23E-07	EF	PDQ
			Total Phosphorus	7723-14-0	6.01E-07	EF	PDQ
			Silicate, portland cement	65997-15-1	7.74E-04	EF	AADQ
Mixer	Truck Loading	LP1	Particulate Matter	n/a - PM	4.88E-02	EF	PDQ
			PM10	14808-60-7	1.30E-05	EF	PDQ
			Arsenic	7440-38-2	6.06E-06	EF	PDQ
			Beryllium	7440-41-7	1.21E-07	EF	PDQ
			Cadmium	7440-43-9	1.70E-08	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	5.68E-06	EF	PDQ
			Lead (and its compounds)	7439-92-1	1.80E-06	EF	PDQ
			Manganese (and its compounds)	7439-96-5	3.05E-05	EF	PDQ
			Nickel (and its compounds)	7440-02-0	5.96E-06	EF	PDQ
			Total Phosphorus	7723-14-0	1.91E-05	EF	PDQ
			Selenium	7782-49-2	1.30E-06	EF	PDQ
			Silicate, portland cement	65997-15-1	4.88E-02	EF	AADQ
Silo #3 - Cement Supplement (Silica Fume)							
Delivery Tanker Truck	Storage Silo #3	BH3	Particulate Matter	n/a - PM	8.31E-03	EF	AADQ
			PM10	14808-60-7	2.08E-03	EF	AADQ
			Arsenic	7440-38-2	6.97E-07	EF	PDQ
			Beryllium	7440-41-7	6.28E-08	EF	PDQ
			Cadmium	7440-43-9	1.38E-08	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	8.47E-07	EF	PDQ
			Lead (and its compounds)	7439-92-1	3.61E-07	EF	PDQ
			Manganese (and its compounds)	7439-96-5	1.78E-07	EF	PDQ
			Nickel (and its compounds)	7440-02-0	1.58E-06	EF	PDQ
			Total Phosphorus	7723-14-0	2.46E-06	EF	PDQ
			Selenium	7782-49-2	5.03E-08	EF	PDQ
			Silicate, portland cement	65997-15-1	8.31E-03	EF	AADQ

Summary of Air Emissions from Material Transfer

Storage Silo #3	Mixer	DC1	Particulate Matter	n/a - PM	7.74E-04	EF	PDQ
			PM10	14808-60-7	2.08E-03	EF	PDQ
			Arsenic	7440-38-2	1.47E-07	EF	PDQ
			Cadmium	7440-43-9	3.53E-10	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	6.31E-08	EF	PDQ
			Lead (and its compounds)	7439-92-1	1.82E-08	EF	PDQ
			Manganese (and its compounds)	7439-96-5	1.88E-06	EF	PDQ
			Nickel (and its compounds)	7440-02-0	1.23E-07	EF	PDQ
			Total Phosphorus	7723-14-0	6.01E-07	EF	PDQ
			Silicate, portland cement	65997-15-1	7.74E-04	EF	AADQ
Mixer	Truck Loading	LP1	Particulate Matter	n/a - PM	4.88E-02	EF	PDQ
			PM10	14808-60-7	3.27E-03	EF	PDQ
			Arsenic	7440-38-2	6.06E-06	EF	PDQ
			Beryllium	7440-41-7	1.21E-07	EF	PDQ
			Cadmium	7440-43-9	1.70E-08	EF	PDQ
			Chromium (metallic, di and trivalent)	7440-47-3	5.68E-06	EF	PDQ
			Lead (and its compounds)	7439-92-1	1.80E-06	EF	PDQ
			Manganese (and its compounds)	7439-96-5	3.05E-05	EF	PDQ
			Nickel (and its compounds)	7440-02-0	5.96E-06	EF	PDQ
			Total Phosphorus	7723-14-0	1.91E-05	EF	PDQ
			Selenium	7782-49-2	1.30E-06	EF	PDQ
			Silicate, portland cement	65997-15-1	4.88E-02	EF	AADQ

EF: Emission Factor
EC: Engineering Calculation

AADQ: Above Average Data Quality
BADQ: Below Average Data Quality

PDQ: Poor Data Quality

References

- Process parameters provided by facility personnel.
- Emission factors for the stockpiles and bin loading were obtained from the drop equation from US EPA AP-42, "Aggregate Handling and Storage Piles", Section 13.2.4, November 2006.
- It is unknown if the aggregate and sand is received washed; therefore, as a conservative approach, a moisture content of 0.25% (lower limit) was used.
- A wind speed of 3.23 m/s is used based on the average wind speed obtained from the MECP regional met data.
- Drop emissions have been estimated for each AERMOD wind category using the maximum wind speed (m/s) for each category, where F is the maximum hourly wind speed for the met data set (A=1.54, B=3.09, C=5.14, D=8.23, E=10.8, and F=18). A factor of 0.04, 0.10, 0.20, 0.36, 0.51, and 1.00 for variable emissions was used for A, B, C, D, E, and F, respectively.
- The maximum daily delivery rate is based on the anticipated material composition for the product. It is anticipated that 1000 and 700 tonne/day of agreegate and sand is delivered per day.
- Material handling rate through the plant is based on a conservative maximum daily production rate of the plant (800 m3/day), where 739.3 m3/day are unwashed materials: 1061 kg/m3 of coarse aggregate, 707 kg/m3 of sand, and 430 kg/m3 of cement materials.
- It was assumed that the cementitious material mixture consists of 75% material from Silo #1, while the remaining balance will consist of material from Silo #2 and Silo #3.
- Silo is controlled by pulse-jet type baghouses with an outlet flow rate of 0.42 m3/s. The baghouse is conservatively assumed to operate 24 hours per day.
- The mixer in the mixing module is equipped with a vibrator-type dust collector, having a flow rate of 0.04 m3/s to capture dust emissions from the mixing operations.
- Baghouse loading rate (20 mg/m3) obtained from MECP Procedure for Preparing an Emission Summary and Dispersion Modelling Report, March 2009, used for the baghouse.
- Loading point is equipped with a long sock to control dust and to convey cement materials from the loading point into the trucks.
- PM and PM10 Emission Factors for controlled and uncontrolled material transfers (aggregate and sand) obtained from US EPA AP-42, "Concrete Batching", Section 11.12, June 2006.
- Emission Factors for metal compounds of silo loading and unloading obtained from US EPA AP-42, "Concrete Batching", Section 11.12, June 2006.
- The highest percentage (by weight) of crytalline silica was conservativaly assumed for each unwashed material. The cleanliness of the sand, which is based on 80 µm, is used as a conservative approach, given that no crytalline silica content was illustrated in the data sheet. No crytalline silica content was also displayed in the silica fume cementitious material; however, the full amount of SiO2 was conservatively assumed to be quartz for the purpose of this assessment.
- Emission Factor for portland cement for controlled storage silo and truck loading determined using the "Proposed Standard Procedures for Evaluating Particulate Matter and Portland Cement Emissions from Concrete Batching".
- A 90% control efficiency is conservatively assumed for enclosure for 3 sides and and a top, with minimal openings as each stage of the process is continuously connected to each other.
- A 25% control efficiency is assumed for a long sock at the loading point to contain the emissions.

Air Emission from Process Heating Combustion Equipment

Description: The facility has a propane boiler used to heat aggregate materials.

Process Operating Conditions

- Combustion source below fueled by propane
- Equipment operating at the following maximum capacities:

Source Description	Source ID	No. of Units	Max. Thermal Energy Input per unit (BTU/hr)	Total Thermal Energy Input (BTU/hr)
Propane Boiler	BIN1	1	5,100,000	5,100,000
Total				5,100,000

Emission Estimation Methodology

- Emissions were calculated using USEPA AP-42 emission factors for industrial propane boilers.

Contaminant	CAS #	Emission Factor (lb/MMBtu)	Maximum Emission Rate (g/s)
Nitrogen Oxide	10102-44-0	1.42E-01	9.13E-02

Sample Calculation

NOx Emission Rate = Fuel Input x Emission Factor
= 5.100 MMBtu x 0.142 lb/MMBtu ÷ 3600 s/h x 453.6 g/lb
= 1.63E-03

Process Emissions Summary

Contaminant	CAS #	Maximum Emission Rate (g/s)	Emission Estimation Technique	Data Quality
Nitrogen Oxide	10102-44-0	9.13E-02	EF	PDQ

EF: Emission Factor PDQ: Poor Data Quality

References

- Combustion source parameters provided by facility personnel.
- USEPA AP-42 Emission Factors. Liquefied Petroleum Gas Combustion, Section 1.5. Table 1.5-1. July 2008. <https://www.epa.gov/sites/default/files/2020-09/documents/1.5_liquefied_petroleum_gas_combustion.pdf>.

APPENDIX C

DISPERSION MODELLING

Table 5-1. Model Inputs - Base

Base.isc

Source ID	Easting Coordinate (m)	Northing Coordinate (m)	Base Elevation (m)	Release Type	Release Height (m)	Emission Rate (g/s)	Exit Temp. (K)	Exit Velocity (m/s)	Exit Diameter (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)	Length of Side (m)	Description	Operating Times
AGG1	310910.72	5098725.04	153	Volume	1.50	1	-	-	-	5.70	0.70	24.50	Aggregate Stockpile	24/7
AGG2	310924.08	5098705.34	153	Volume	1.50	1	-	-	-	5.70	0.70	24.50	Aggregate Stockpile	24/7
SAN1	310886.67	5098688.50	153	Volume	1.50	1	-	-	-	3.49	0.70	15.00	Sand Stockpile	24/7
BIN1	310868.39	5098694.78	153	Volume	4.90	1	-	-	-	3.49	2.28	15.00	Storage Bins / Hopper	24/7
CON1	310868.39	5098694.78	153	Volume	3.00	1	-	-	-	3.49	1.40	15.00	Flying Weighing System & Conveyor	24/7
SC1	310853.50	5098716.97	153.6	Volume	8.45	1	-	-	-	1.30	3.93	5.60	Elevated Scale	24/7
LP1	310853.50	5098716.97	153.6	Volume	4.20	1	-	-	-	1.30	1.95	5.60	Loading Point	24/7
DC1	310857.35	5098718.32	153.37	Vertical/Capped	8.30	1	298.15	0.66	0.27	-	-	-	Mixer Dust Collector	24/7
BH1	310862.28	5098726.83	153.08	Vertical/Capped	12.35	1	298.15	0.86	0.78	-	-	-	Baghouse	24/7
BH2	310864.63	5098723.36	153	Vertical/Capped	12.35	1	298.15	0.86	0.78	-	-	-	Baghouse	24/7
BH3	310867.32	5098719.87	153	Vertical/Capped	12.35	1	298.15	0.86	0.78	-	-	-	Baghouse	24/7

Table 6-1. AERMOD Outputs; 1-hr results

Contaminant	CAS #	AGG1		AGG2		SAN1		BIN1		CON1		SC1	
		Emission Rate (g/s)	Dispersion Factor 5.471 ug/m3	Emission Rate (g/s)	Dispersion Factor 5.149 ug/m3	Emission Rate (g/s)	Dispersion Factor 5.69 ug/m3	Emission Rate (g/s)	Dispersion Factor 10.24 ug/m3	Emission Rate (g/s)	Dispersion Factor 173.3 ug/m3	Emission Rate (g/s)	Dispersion Factor 292.8 ug/m3
Nitrogen Oxide	10102-44-0	-	-	-	-	-	-	9.13E-02	9.35E-01	-	-	-	-

Contaminant	CAS #	LP1		DC1		BH1		BH2		BH3		Total POI Concentration ($\mu g/m^3$)
		Emission Rate (g/s)	Dispersion Factor 209.7 ug/m3	Emission Rate (g/s)	Dispersion Factor 1915 ug/m3	Emission Rate (g/s)	Dispersion Factor 507.1 ug/m3	Emission Rate (g/s)	Dispersion Factor 508.7 ug/m3	Emission Rate (g/s)	Dispersion Factor 606.6 ug/m3	
Nitrogen Oxide	10102-44-0	-	-	-	-	-	-	-	-	-	-	9.35E-01

Sample Calculation

POI Concentration of Nitrogen Oxide for BIN1 = Emission Rate x Dispersion Factor
= 9.13E-02 g/s x 10.2 µg/m3
= 9.35E-01 µg/m3

Table 6-2. AERMOD Outputs; 24-hr results

Contaminant	CAS #	AGG1		AGG2		SAN1		BIN1		CON1		SC1	
		Emission Rate (g/s)	Dispersion Factor 2.98 ug/m3	Emission Rate (g/s)	Dispersion Factor 2.217 ug/m3	Emission Rate (g/s)	Dispersion Factor 3.571 ug/m3	Emission Rate (g/s)	Dispersion Factor 4.564 ug/m3	Emission Rate (g/s)	Dispersion Factor 80.36 ug/m3	Emission Rate (g/s)	Dispersion Factor 131.8 ug/m3
Arsenic	7440-38-2	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	7440-41-7	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	7440-43-9	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (metallic, di and trivalent)	7440-47-3	-	-	-	-	-	-	-	-	-	-	-	-
Lead (and its compounds)	7439-92-1	-	-	-	-	-	-	-	-	-	-	-	-
Manganese (and its compounds)	7439-96-5	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (and its compounds)	7440-02-0	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Oxide	10102-44-0	-	-	-	-	-	-	9.13E-02	4.17E-01	-	-	-	-
Particulate Matter	n/a - PM	2.07E-01	6.18E-01	2.07E-01	4.60E-01	2.90E-01	1.04E+00	5.87E-01	2.68E+00	4.16E-03	3.34E-01	4.16E-03	5.48E-01
PM10	14808-60-7	3.24E-04	9.65E-04	3.24E-04	7.18E-04	4.40E-03	1.57E-02	4.10E-03	1.87E-02	1.62E-05	1.30E-03	1.62E-05	2.13E-03
Selenium	7782-49-2	-	-	-	-	-	-	-	-	-	-	-	-
Silicate, portland cement	65997-15-1	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	7723-14-0	-	-	-	-	-	-	-	-	-	-	-	-

Contaminant	CAS #	LP1		DC1		BH1		BH2		BH3		Total POI Concentration ($\mu g/m^3$)
		Emission Rate (g/s)	Dispersion Factor 130.3 ug/m3	Emission Rate (g/s)	Dispersion Factor 446.2 ug/m3	Emission Rate (g/s)	Dispersion Factor 157.9 ug/m3	Emission Rate (g/s)	Dispersion Factor 160.8 ug/m3	Emission Rate (g/s)	Dispersion Factor 135.2 ug/m3	
Arsenic	7440-38-2	3.03E-05	3.95E-03	7.37E-07	3.29E-04	7.36E-09	1.16E-06	6.97E-07	1.12E-04	6.97E-07	9.43E-05	4.49E-03
Beryllium	7440-41-7	6.07E-07	7.91E-05	-	-	8.44E-10	1.33E-07	6.28E-08	1.01E-05	6.28E-08	8.49E-06	9.78E-05
Cadmium	7440-43-9	8.51E-08	1.11E-05	1.77E-09	7.88E-07	-	-	1.38E-08	2.22E-06	1.38E-08	1.86E-06	1.60E-05
Chromium (metallic, di and trivalent)	7440-47-3	2.84E-05	3.70E-03	3.16E-07	1.41E-04	5.03E-08	7.95E-06	8.47E-07	1.36E-04	8.47E-07	1.15E-04	4.10E-03
Lead (and its compounds)	7439-92-1	9.01E-06	1.17E-03	9.11E-08	4.06E-05	1.90E-08	2.99E-06	3.61E-07	5.81E-05	3.61E-07	4.88E-05	1.32E-03
Manganese (and its compounds)	7439-96-5	1.52E-04	1.98E-02	9.41E-06	4.20E-03	2.04E-07	3.22E-05	1.78E-07	2.86E-05	1.78E-07	2.40E-05	2.41E-02
Nickel (and its compounds)	7440-02-0	2.98E-05	3.88E-03	6.17E-07	2.75E-04	7.26E-08	1.15E-05	1.58E-06	2.55E-04	1.58E-06	2.14E-04	4.64E-03
Nitrogen Oxide	10102-44-0	-	-	-	-	-	-	-	-	-	-	4.17E-01
Particulate Matter	n/a - PM	2.75E-01	3.58E+01	3.87E-03	1.73E+00	8.31E-03	1.31E+00	8.31E-03	1.34E+00	8.31E-03	1.12E+00	4.70E+01
PM10	14808-60-7	3.45E-03	4.49E-01	2.13E-03	9.50E-01	8.31E-06	1.31E-03	8.31E-06	1.34E-03	2.08E-03	2.82E-01	1.72E+00
Selenium	7782-49-2	6.52E-06	8.50E-04	-	-	-	-	5.03E-08	8.08E-06	5.03E-08	6.80E-06	8.64E-04
Silicate, portland cement	65997-15-1	2.07E-01	2.70E+01	2.13E-03	9.50E-01	6.23E-03	9.84E-01	8.31E-03	1.34E+00	8.31E-03	1.12E+00	3.14E+01
Total Phosphorus	7723-14-0	9.56E-05	1.25E-02	3.01E-06	1.34E-03	-	-	2.46E-06	3.95E-04	2.46E-06	3.32E-04	1.45E-02

Sample Calculation

POI Concentration of Particulate Matter for AGG1 = Emission Rate x Dispersion Factor
= 2.07E-01 g/s x 3.0 µg/m3
= 6.18E-01 µg/m3

Table 6-3. AERMOD Outputs; 30-days results

Contaminant	CAS #	AGG1		AGG2		SAN1		BIN1		CON1		SC1	
		Emission Rate (g/s)	Dispersion Factor 2.222 ug/m3	Emission Rate (g/s)	Dispersion Factor 1.665 ug/m3	Emission Rate (g/s)	Dispersion Factor 2.651 ug/m3	Emission Rate (g/s)	Dispersion Factor 3.282 ug/m3	Emission Rate (g/s)	Dispersion Factor 40.73 ug/m3	Emission Rate (g/s)	Dispersion Factor 61.68 ug/m3
Lead (and its compounds)	7439-92-1	-	-	-	-	-	-	-	-	-	-	-	-

Contaminant	CAS #	LP1		DC1		BH1		BH2		BH3		Total POI Concentration ($\mu g/m^3$)
		Emission Rate (g/s)	Dispersion Factor 67.23 ug/m3	Emission Rate (g/s)	Dispersion Factor 80.2 ug/m3	Emission Rate (g/s)	Dispersion Factor 56.91 ug/m3	Emission Rate (g/s)	Dispersion Factor 52.68 ug/m3	Emission Rate (g/s)	Dispersion Factor 49.35 ug/m3	
Lead (and its compounds)	7439-92-1	9.01E-06	6.06E-04	9.11E-08	7.30E-06	1.90E-08	1.08E-06	3.61E-07	1.90E-05	3.61E-07	1.78E-05	6.51E-04

Sample Calculation

POI Concentration of Lead (and its compounds) for LP1 = Emission Rate x Dispersion Factor
= 9.01E-06 g/s x 67.2 µg/m3
= 6.06E-04 µg/m3

Table 6-4. AERMOD Outputs; Annual results

Contaminant	CAS #	AGG1		AGG2		SAN1		BIN1		CON1		SC1	
		Emission Rate (g/s)	Dispersion Factor 1.603 ug/m3	Emission Rate (g/s)	Dispersion Factor 1.195 ug/m3	Emission Rate (g/s)	Dispersion Factor 1.92 ug/m3	Emission Rate (g/s)	Dispersion Factor 2.168 ug/m3	Emission Rate (g/s)	Dispersion Factor 25.19 ug/m3	Emission Rate (g/s)	Dispersion Factor 39.47 ug/m3
Nickel (and its compounds)	7440-02-0	-	-	-	-	-	-	-	-	-	-	-	-

Contaminant	CAS #	LP1		DC1		BH1		BH2		BH3		Total POI Concentration ($\mu g/m^3$)
		Emission Rate (g/s)	Dispersion Factor 41.81 ug/m3	Emission Rate (g/s)	Dispersion Factor 49.2 ug/m3	Emission Rate (g/s)	Dispersion Factor 36.99 ug/m3	Emission Rate (g/s)	Dispersion Factor 33.97 ug/m3	Emission Rate (g/s)	Dispersion Factor 31.61 ug/m3	
Nickel (and its compounds)	7440-02-0	2.98E-05	1.25E-03	6.17E-07	3.04E-05	7.26E-08	2.68E-06	1.58E-06	5.38E-05	1.58E-06	5.00E-05	1.38E-03

Sample Calculation

POI Concentration of Nickel for LP1 = Emission Rate x Dispersion Factor
= 2.98E-05 g/s x 41.8 µg/m3
= 1.25E-03 µg/m3

APPENDIX D

SUPPORTING MATERIALS

BEST MANAGEMENT PRACTICES PLAN FOR CONTROL OF FUGITIVE DUST EMISSIONS

FOR

BIRD CONSTRUCTION INDUSTRIAL SERVICES LTD.

SUBMITTED TO:

Bird Construction Industrial Services Ltd.
400-5700 Explorer Drive
Mississauga, Ontario, L4W 0C6

SUBMITTED BY:

Ben Sprang
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SE #: 1185.001

February 22, 2023

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1.0 INTRODUCTION

Bird Construction Industrial Services Ltd. (Bird) retained SONAIR Environmental Inc. (SONAIR) to prepare a Best Management Practices Plan (BMPP) for Control of Fugitive Dust Emissions for its proposed ready-mix portable concrete facility located at Part Lot 4 Concessions 7 & 8 Township of Buchanan and Part of Lot 3 Concession 8 Village of Chalk River.

2.0 IDENTIFICATION OF MAIN SOURCES OF FUGITIVE DUST

The main sources of fugitive dust at the subject site are the following:

- On-site traffic
- Unpaved roads/areas
- Material stockpiles
- Loading/unloading areas and loading/unloading techniques:
    - Raw material delivery and delivery techniques
    - Raw material transfer and transfer techniques
    - Product loading and loading techniques
- Material spills
- General work areas (Covered under Unpaved roads/areas)

3.0 POTENTIAL CAUSES OF HIGH DUST EMISSIONS

The potential causes for high dust emissions from the sources mentioned in Section 2 are as follows:

- On-site traffic
    - Traffic movement (raw material delivery trucks, ready-mix trucks, contractor vehicles, loaders)
- Unpaved roads/areas
    - Fines generated on unpaved areas
    - Accumulated dust from raw material delivery, storage, and transfer
- Material stockpiles
    - Wind erosion
- Loading/unloading areas and loading/unloading techniques
    - Raw material drops

- Material spills
    - Raw material drops outside of a transfer point
- General work areas
    - Covered under 'Unpaved roads/areas'

4.0 PREVENTATIVE AND CONTROL MEASURES PROPOSED OR IN PLACE TO MINIMIZE THE LIKELIHOOD OF HIGH DUST EMISSIONS FROM THE SOURCES OF FUGITIVE DUST EMISSIONS IDENTIFIED

4.1 On-site Traffic

- Traffic speed on site is limited to a maximum of 20 km/hr.

4.2 Unpaved Roads/Areas

- Activity on unpaved roads and areas is kept to a minimum
- High traffic unpaved roads and areas are treated with a water truck or equivalent dust suppression measures as required*

*"As required" for this portion of the BMPP is defined as: The Manager/Supervisor or designate observes that there is a high potential for dust to leave the property. Additional inspections will take place if weather conditions change (winds picking up or changing direction). The results of these inspections will be documented in the inspection form portion of the Daily Site Maintenance Record Book.

4.3 Material Stockpiles

- Aggregate stockpiles are to be placed to minimize wind erosion
- All aggregate and sand stockpiles are to be kept below the height of the plant
- The working face of each stockpile is to be minimized
- Aggregate and sand are to be handled minimally, ideally being handled once for delivery and once more for loading

4.4 Loading/Unloading Areas, Loading/Unloading Techniques

- Raw material trucks deliver of sand and gravel to base of stockpiles
- The loader minimizes the working face of the stockpile
- The loader bucket is filled such that all material is contained within the bucket during transport to its destination
- Cement and cementitious materials are delivered directly to on-site silos, each equipped with a dust collector to control emissions.

4.5 Material Spills

Significant raw material spills are not expected. Minor spillage from the front-end loader may occur.

- The front-end loader working area as well as the area below the conveyor will be monitored (visual inspection) throughout the day, with particular attention to spillage
- Spilled aggregate and sand will be cleaned up promptly

4.6 General Work Areas

- Covered under 'Unpaved roads/areas'

4.7 Truck Washing Station

- Trucks and its drums are to be cleaned thoroughly and as needed at the on-site truck washing station

5.0 AN IMPLEMENTATION SCHEDULE FOR THE BMPP, INCLUDING TRAINING OF FACILITY PERSONNEL

The procedures outlined in this document must be implemented as soon as the facility commence operations. Employees will be formally trained within 2 weeks from the implementation of the Plan. All new staff will be trained at their hiring and staff will review the training annually.

6.0 INSPECTION AND MAINTENANCE PROCEDURES AND MONITORING INITIATIVES TO ENSURE EFFECTIVE IMPLEMENTATION OF THE PREVENTITAVE AND CONTROL MEASURES

The effective implementation of the Plan will be the responsibility of the Supervisor at the location. He/she will keep a master copy of the Plan and associated documents in the main site office.

As an important feedback mechanism, the Site will keep a Record of training, incidents, and suggestions for improvement, as well as a Complaint Log along side the Fugitive Dust Control Plan.

The Supervisor will monitor the on-going performance of the Plan through ongoing review of these records and the Facility Maintenance Record Book entries.

Retention: The company will retain these documents for a period of two years for audit/review purposes.

7.0 FUGITIVE DUST EMERGENCIES

7.1 Spills

- Aggregate and Sand Raw Materials:

In the event of a significant aggregate and sand raw material spill that cannot be cleaned-up immediately as described under Section 4.5 of this BMPP, Bird Construction Industrial Services Ltd. will clean up the spill as soon as possible.

7.2 Excessive Winds

In the event of excessive winds in very dry conditions, the Supervisor will conduct additional frequent visual inspections of the main sources of dust (See Section 2). As necessary, the Supervisor will order safe and appropriate additional dust mitigation which may include watering of the roads, working areas and stockpiles.

FUGITIVE DUST CONTROL TRAINING ATTENDANCE SHEET

Date	Name	Signature

SITE LOG – DUST COMPLAINTS

Date	Suggestions for Improvement	Action / Resolution	Complaint Record Completed

RECORD OF ENVIRONMENTAL COMPLAINT AND RESPONSE

1. Location: _____

2. Date and Time Complaint Received: _____

3. Name of Complainant: _____

Address: _____

Telephone Number: _____

4. Form of Complaint and Summary: Visit [ ] Telephone [ ] Letter [ ] (Attach Copy)
Other _____

5. Complaint Referred to Technical Services: No [ ] Yes [ ] and provide details:

_____

6. Contact Made with Government Official(s): No [ ] Yes [ ]
If Yes, Complete and Attach Record of Government Environmental Official Contact Form

7. Details Concerning Investigation Made by Company Concerning Complaint: (Include Wind Direction and Weather Conditions)

_____

_____

_____

8. Response to Complainant:

Letter [ ] Date_____ Attach copy of letter to this form.

Telephone Call [ ] Date_____ Time _____

Summary of Telephone Call:

_____

_____

9. Follow-up Action Required and/or Taken by Company and Personnel Responsible:

None [ ] Details:

_____

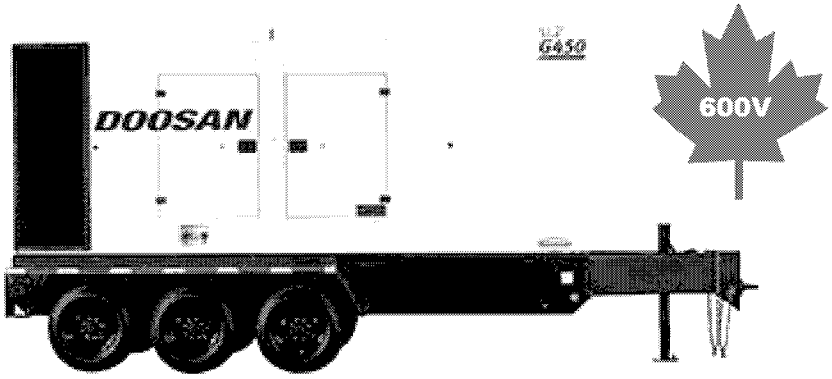
_____

10. Filed Original Form in the Site Environmental Manual: Yes [ ]

Date _____ Staff Signature, Name & Position_____

G450WCU-2C-T2

Mobile Generators



Key Features

- Manufactured in Statesville, North Carolina, USA.
- Heavy duty generator system designed for prime power operation in rental, construction and special events applications.
- Generator is CSA certified for electrical equipment per C22.2, No. 14.

Skidbase and Enclosure

- Package foundation is a heavy duty, oilfield-ready skidbase designed with minimum 110% environmental containment to prevent any leakage of fuel, oil, or coolant.
- Optimized package design combines low noise levels with small footprint and full load performance capability in high ambient temperatures.
- The enclosure is coated with a 13 stage paint process including E-coat primer for superior corrosion resistance and a high gloss powder paint for long life.
- Wide opening side access doors are hinged, providing easy access and are equipped with recessed, pad-lockable handles.
- Package is equipped with a center-point lifting eye for safe, well-balanced hoisting, designed with a 5 x safety factor for the weight of a fully fueled unit with running gear.

Engine and Cooling System

- Industrial, heavy-duty diesel engine is emissions certified to current EPA requirements and provides optimum mix of performance and fuel economy.
- Electronically controlled engine provides isochronous frequency control and advanced diagnostic monitoring and protection.
- Oversized cooling system rated for high ambient temperature (minimum 40°C/104°F) operation without de-rating.
- The engine generator assembly is mounted on fail-safe vibration isolators.
- Coolant and oil drains are piped to bulkhead fittings mounted on the enclosure and all filters and maintenance points are easily accessed for safe and easy servicing.
- Engines are globally supported by the engine OEM and Doosan Portable Power.

Generator

- Dedicated 600VAC-ouput Leroy Somer alternators feature AREP brushless excitation providing industry leading motor starting kVA and 300% overload capability.
- Class H insulation with upgraded environmental coating for ultimate resistance to high temperature and humidity.

Control System

- Operator-preferred analog gauges provide at-a-glance monitoring of vital engine and generator parameters.
- Solid state engine control module provides convenient, microprocessor-controlled startup at the push of a button and protects the generator system from an array of faults while providing the operator with indication of any faults on the LED display.
- Engine fault codes are displayed on an LCD display, providing operators and technicians with a numeric and text explanation of the fault code, minimizing the need for expensive hand-held code scanners.
- Standard remote Auto Start / Stop capability via two wire, closed contact logic, allows for connection to automatic transfer switchgear and other remote starting devices.
- Battery disconnect switch is mounted inside the enclosure.

Power Connections

- All controls and connection points are grouped at the rear of the unit for safety and operator convenience.
- Power cables are connected at an oversized five lug (L1 L2 L3 N PE) terminal board capable of accepting bare end cable or terminated cables.

Voltage	P.F.	Armature Connection	Rating	Amps	kW	kVA
600V-3Ø	0.8	Series Wye	Prime	448	373	466
			Standby	493	410	513

(800) 633-5206
DoosanPortablePower.com

Doosan Infracore
Portable Power

Fuel System

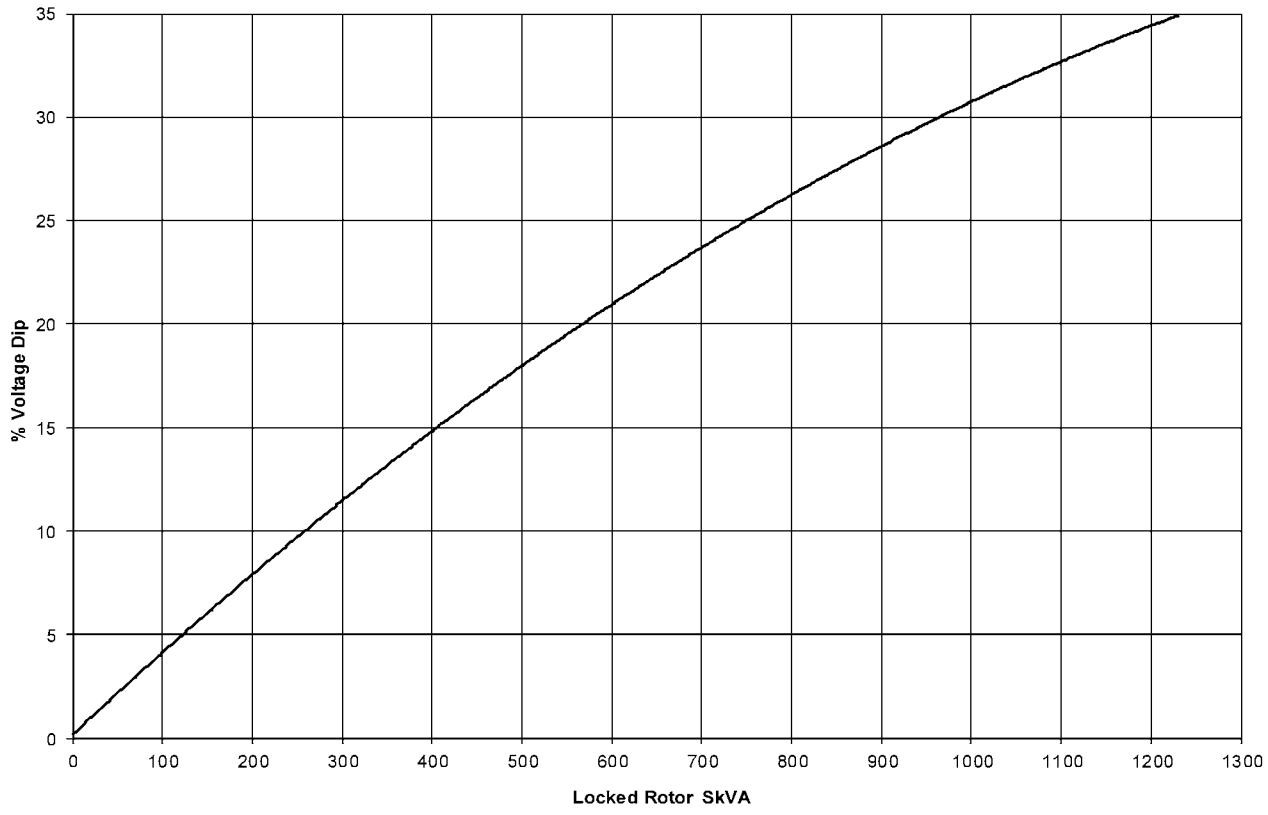
- Single fuel tank sized for 24 hour runtime is mounted within the skid base, providing double wall protection.
- Fuel tank mounted low in frame and centered to ensure balanced lifting and low center of gravity.
- The fuel filler is located within the containment basin, minimizing possible spillage.
- Standard Racor-style fuel / water separator and fine micron secondary fuel filter keep contaminates out of the system and increase reliability.
- The containment system features a three-inch drain plug for easy cleaning, and the fuel tank has a drain plug mounted behind the containment plug.
- Leak-proof fuel vents eliminate the potential for fuel purge during out-of-level conditions during transport and load / unload.
- Low fuel shutdown ensures the engines will not lose prime if they run out of fuel.

Running Gear

- Integrated running gear system mounts directly to generator skidbase providing an industry-best low center of gravity for safe, stable towing, on-road or off-road.
- Triple axle, leaf spring suspension with E-Z-Lube hub assemblies and electric brakes.
- All models feature high quality, grommet-mount lighting and meet Federal Motor Vehicle Safety Standards for lighting and conspicuity.
- Trailer-to-vehicle connector is a 6-pole round plug with a high quality, jacketed wiring harness.
- All units are equipped with a 3-inch pintle eye, wheel chocks and a high quality, heavy-duty jack stand.

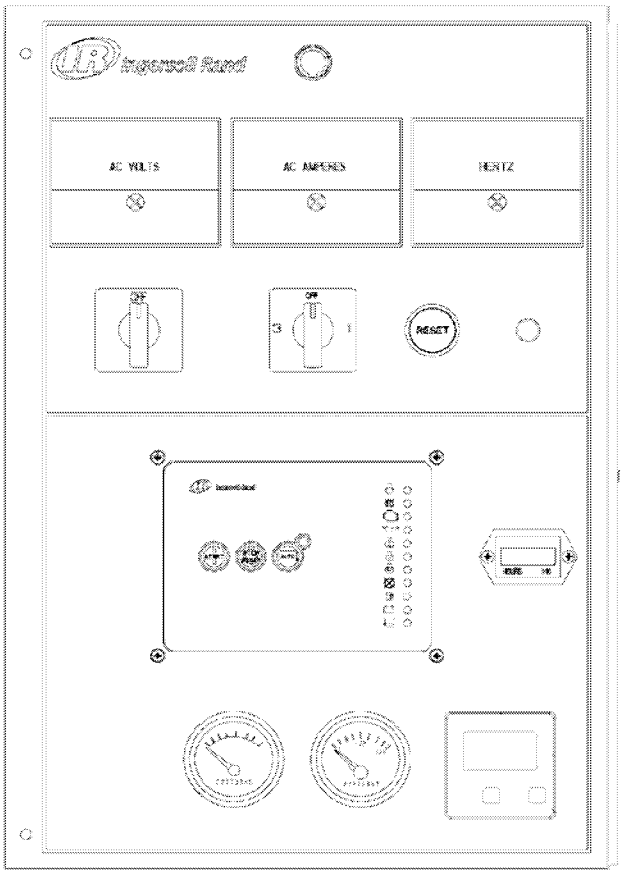
Warranty

- All models are covered by a comprehensive limited warranty:
- Package: 1 year / 2000 hours
- Cummins Engine: 1 year / unlimited hours
- Leroy Somer Alternator: 2 years / 4000 hours



G450WCU-2C-T2 Mobile Generators

Engine Data		
Engine Manufacturer	Cummins	
Model Number	QSX15-G9	
Prime Output @ Rated Speed	544 HP	405 kWm
Standby Output @ Rated Speed	755 HP	563 kWm
Engine Type	Inline 4-cycle	
Engine Control	ECU	
Emissions Certification	EPA Tier 2	
Number of Cylinders	6	
Aspiration	Turbocharged / Intercooled	
Bore × Stroke	5.39 × 6.65 in	137 × 169 mm
Displacement	912 in^3	15 L
Compression Ratio	17 : 1	
Governor Type	Electronic / Isochronous	
Speed Regulation Accuracy	+ / - 0.25% Steady State	
Single Step Load Acceptance	100%	
Cooling System	50% Glycol / 50% Water	
Charging Alternator Output	35 A	
DC System Voltage	24 V	
Battery Output	2 × 1300 CCA	



Fluid Capacities	Gal	L
Oil Sump Capacity	24.0	90.8
Cooling System Capacity	16.3	61.7
Usable Fuel Cell Capacity	574.0	2172.8

Fuel Consumption	Gal / h	L / h	Runtime
@ 25% Load	8.2	31.0	70.0
@ 50% Load	14.7	55.6	39.0
@ 75% Load	20.3	76.8	28.3
@ 100% Load	25.8	97.7	22.2

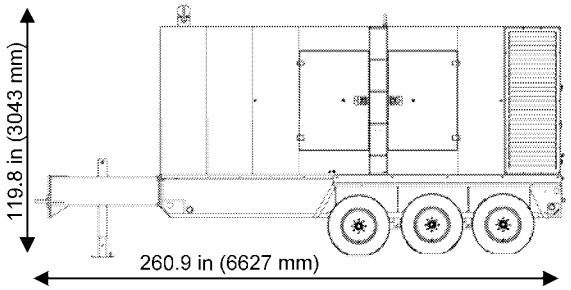
Alternator Data	
Alternator Manufacturer	Leroy Somer
Alternator Model	LSA 472 VS2
Alternator Type	Four Pole Revolving Field
Number of Leads	6
Insulation Class	H
Frequency	60 Hz
Available Voltages—3Ø	600 V
Available Voltages—1Ø	346 V
Voltage Connection Method	Direct Hardwired
Excitation Method	Brushless with AREP
Voltage Regulator Model	R448
Voltage Regulation Accuracy	+ / - 0.5% Steady State
Total Harmonic Distortion (THD)	<5% @ No Load
Telephone Influence Factor (TIF)	<50

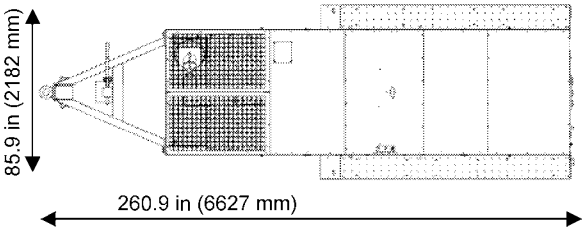
Power Connections		Qty
20A—125V GFCI Duplex (NEMA 5-20R)		N/A
50A—125/250V Temp Power (CS6369)		N/A
Terminal Board Maximum Cable Size (Bare Wire)	1000 MCM	
Terminal Board Maximum Cable Size (Lugged)	1000 MCM	

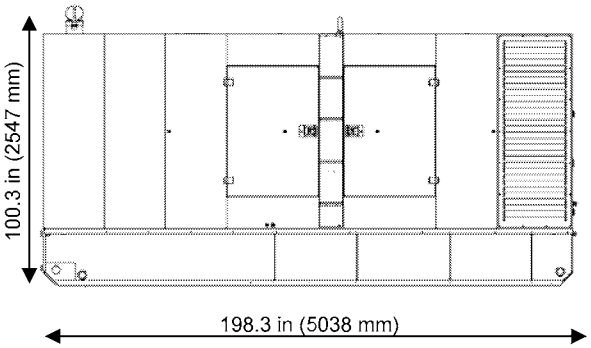
Reference Conditions		
Rated Ambient Temperature	10°-104°F	-12°-40°C
Minimum Starting Temperature (Standard)		10°F (-12°C)
Minimum Starting Temperature (w/ Cold Start Opt)		0°F (-18°C)
Rated Altitude		
Temperature De-rate Factor		
Altitude De-rate Factor		

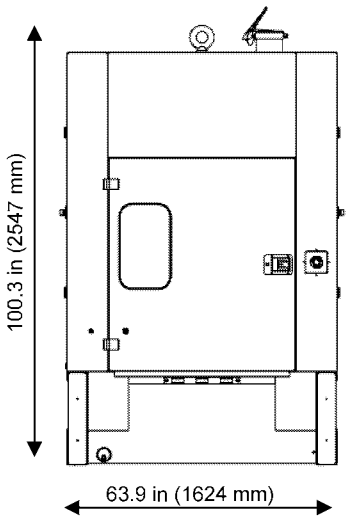
G450WCU-2C-T2 Mobile Generators

Running Gear	To 49CFR571 requirements	
Configuration	Triple axle	
Suspension	Leaf spring	
Standard Brake System Configuration	Electric	
Tires	9.50-16.5 LT/E	
Wheels	16.5" × 6.75" (419 mm × 171 mm), 8 lug on 6.5" (165 mm) bolt circle	
Lighting and Reflectors	Meets FMVSS 571.108 requirements	
Electrical Connection to Towing Vehicle	Six pole round plug	
Standard Coupling Connection	3" (76 mm) Pintle eye	
Hitch Height	21.5-26-30.5-35 in	546-660-775-889 mm
Safety Chains	2 × 3/8" (10 mm) Chains with slip hooks and safety latches	
Jack Stand Configuration	10,000lb (4,536 kg) Capacity, top wind with sand shoe, fixed mount	
Weights & Dimensions (w/ Running Gear)		
Length	260.9 in	6,627 mm
Width	85.9 in	2,182 mm
Height	119.8 in	3,043 mm
Weight (Shipping)	13,868 lb	6,290 kg
Weight (Ready to Run)	18,271 lb	8,288 kg
Weights & Dimensions (Less Running Gear)		
Length	198.3 in	5,038 mm
Width	63.9 in	1,624 mm
Height	100.3 in	2,547 mm
Weight (Shipping)	12,095 lb	5,486 kg
Weight (Ready to Run)	16,498 lb	7,483 kg
Sound Level @ 23ft (7m), 100% Load	74 dB(A)	









Doosan Infracore Portable Power
1293 Glenway Drive
Statesville, NC 28625

(800) 633-5206
DoosanPortablePower.com

Due to continuous product improvement, specifications subject to change without notice.

SNC-Lavalin GEM Ontario Inc.
401 Hanlan Road
Woodbridge, Ontario, Canada L4L 3T1
T 905.851.0999 F 905.851.0997

SNC·LAVALIN

COARSE AGGREGATE PETROGRAPHIC ANALYSIS (LS-609)

Project #: 679768 (121621571) | Client: Stantec (WW Siegel Sand &Gravel) | Date Tested: Jan17 2022 | Lab #: 4947 (9956)
Material: 19 mmm Concrete Stone | MAIDB #: N/A | Date Sampled: Nov 29 2021 | Analyst: A.Liang
Sour[illegible] Gariepy Pit | Location: Gariepy Pit | Sampled By: Client | Reviewed By: Z.Brcic, P.Eng

TYPE #	TYPE	MASS (g)	% (R19)	MASS (g)	% (19-13.2)	MASS (g)	% (13.2-9.5)	MASS (g)	% (9.5-4.75)	WEIGHTED COMP. (%)
1	CARBONATE (hard; silty, hard)									
20	CARBONATE(surf.weath.;silty, surf.weath.;med. hard;silty, med. hard)									
2	CARBONATE (sandy, hard or medium hard)									
21	CARBONATE (slightly cherty; <5% chert)									
23	MARBLE (hard or medium hard)									
3	CONGLOMERATE-SANDSTONE-ARKOSE (hard)									
22	CONGLOMERATE-SANDSTONE-ARKOSE (m.h)									
6	GREYWACKE-ARGILLITE (hard or medium hard)									
4	GNEISS-AMPHIBOLITE-SCHIST (hard)(some magnetic)			762.4	49.39	300.1	58.79	117.6	49.16	51.99
5	QUARTZITE									
8	GRANITE-DIORITE-GABBRO (hard)(some magnetic)			681.2	44.13	179.8	35.22	105.2	43.98	41.56
7	VOLCANIC (hard or medium hard)									
9	TRAP (hard)(some magnetic)			67.3	4.36	19.9	3.90	1.6	0.67	3.11
10	QUARTZ (vein or pegmatitic)							0.8	0.33	0.10
-	TOTAL GOOD AGGREGATE	0.0	0.0	1510.9	97.9	499.8	97.9	225.2	94.1	96.8
35	CARBONATE (soft; silty, soft; slightly shaley)									
41	CARBONATE (soft; pitted)									
42	CARBONATE (deeply weathered; silty, deeply weathered)									
40	CARBONATE (sandy, soft)									
24	MARBLE (brittle)									
26	CHERT-CHERTY CARBONATE (<20% leached chert)									
30	CONGLOMERATE-SANDSTONE-ARKOSE (brittle)									
29	GREYWACKE (brittle)									
52	ENCRUSTATION									
25	[illegible]EISS-AMPHIBOLITE-SCHIST (brittle)			15.1	0.98	9.6	1.88	8.5	3.55	2.02
34	[illegible]CILLITE (medium soft)									
27	GRANITE-DIORITE-GABBRO (brittle)			6.6	0.43					0.18
28	VOLCANIC (soft)									
-	TOTAL FAIR AGGREGATE	0.0	0.0	21.7	1.4	9.6	1.9	8.5	3.6	2.2
43	CARBONATE (shaley; clayey; silty, clayey)									
44	CARBONATE (ochreous; sandy, ochreous)									
49	MARBLE (friable)									
45	CHERT-CHERTY CARBONATE (≥20% leached chert)									
46	CONGLOMERATE-SANDSTONE-ARKOSE (friable)									
56	SILTSTONE									
53	CEMENTATION (partial)									
54	CEMENTATION (total)									
50	GNEISS-AMPHIBOLITE (friable)			10.9	0.71	1.1	0.22	5.5	2.30	1.05
55	SCHIST (soft)									
51	GRANITE-DIORITE-GABBRO (friable)									
48	VOLCANIC (very soft, porous)									
-	TOTAL POOR AGGREGATE	0.0	0.0	10.9	0.7	1.1	0.2	5.5	2.3	1.1
60	OCHRE									
61	SHALE									
62	CLAY									
63	VOLCANIC-GNEISS-SCHIST (decomposed)									
-	TOTAL DELETERIOUS AGGREGATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-	TOTALS	0.0	0.0	1543.5	100.0	510.5	100.0	239.2	100.0	100.0
	CONTAMINANTS (not included in PN calculations)									
	TOTALS (with contaminants)									

stimate % Crushed =	% GOOD	x 1	0.0	x 1	97.9	x 1	97.9	x 1	94.1	WEIGHTED AVERAGE PN
dditi[illegible]l Information:	% FAIR	x 3	0.0	x 3	4.2	x 3	5.6	x 3	10.7	
	% POOR	x 6	0.0	x 6	4.2	x 6	1.3	x 6	13.8	
	% DELETERIOUS	x 10	0.0	x 10	0.0	x 10	0.0	x 10	0.0	
	PN =	0		106		105		119		110

COARSE AGGREGATE GRADATION OF AS-RECEIVED SAMPLE, % RETAINED	75-53	53-37.5	37.5-26.5	26.5-19	19-13.2	13.2-9.5	9.5-4.75
	0.0	0.0	0.0	5.0	36.2	28.4	30.4

ESSAIS SUR MATÉRIAUX GRANULAIRES FINS

LE-21-6017-00

V/D :

CLIENT	Campbell's Bay Cement	N° client:	CAMPBE101
PROJET	Contrôle qualitatif des matériaux | Année 2022		

TYPE DE MATÉRIAU	Sable naturel	FOURNISSEUR	Sablière Chemin Cummings
CALIBRE	Sable à béton BC 80 µm - 5 (sablière)	PROVENANCE	Pile de réserve à la sablière
USAGE	Béton de ciment	N° DE RÉF. CLIENT	
ÉPAISSEUR DE LA COUCHE		N° DE LAB.	250965
ÉCHANTILLONNÉ PAR	Client	DATE	2022-03-01

GRANULOMÉTRIE

CSA A23,2-2A et 5A / LC 21-040

Tamis (mm)	% Passant	Exigences
112		
80		
56		
40		
31,5		
20		
14		
10	100	100
5	95	95-100
2,5	81	80-100
1,25	58	50-90
0,630	37	25-65
0,315	14	10-35
0,160	7	2-10
0,080	3,3 *	0-3

(*) = Un astérisque indique le ou les résultats non-conformes

ESSAIS DIVERS

Micro-Deval	CSA A23.2-23A		11,9
Exigence: max. 20	(%)		
Densité brute (état sec)	CSA A23.2-6A		2,690
Densité brute (état SSS)	CSA A23.2-6A		2,704
Densité brute (apparente)	CSA A23.2-6A		2,729
Absorption	CSA A23.2-6A	(%)	0,54
Masse volumique	CSA A23.2-10A	tassée (kg/m³)	1775
		non-tassée (kg/m³)	1618
		pourcentage de vides	
Motte d'argiles	CSA A23,2-3A		0,0
Exigence: max. 1.0	(%)		
Teneur en particules légères	CSA A23,2-4A		0,0
Exigence: max. 0.5	(%)		
Indice colorimétrique	CSA A23,2-7A		0
Exigence: max. 3	Couleur comparative		
Propreté (80µm)	CSA A23,2-5A		3,2
Exigence: max. 3.0	(%)		
Réaction alcalis granulat	CSA A23,2-14A		À venir
1 an	(%)		
Réaction alcalis granulat	CSA A23,2-25A		Voir
Expension accélérée	(%)		Rapport
Durabilité (MgS04)	CSA A23.2-9A	perte>5mm (%)	
Exigence: max. 16		perte<5mm (%)	5,5
		perte combinée (%)	
Module de finesse	CSA A23,1-04		3,08

Friabilité	LC 21-080	(%)	
Micro-Deval	LC 21-101	(%)	
Teneur en eau	LC 21-200	(%)	
Densité brute (état sec)	LC 21-065		
	LC 21-066		
Densité brute (état SSS)	LC 21-065		
	LC 21-066		
Densité brute (apparente)	LC 21-065		
	LC 21-066		
Absorption (%)	LC 21-065		
	LC 21-066		
Masse volumique	LC 21-060	tassée (kg/m³)	
		non-tassée (kg/m³)	
		pourcentage de vides	
Bleu de méthylène	LC 21-255	(%)	
Matières Organiques	LC 31-228	(%)	
Détermination de la teneur	LC-21-260		
en impuretés matériaux recyclés	(%)		
Teneur en particules	NQ 2501-025		
inférieures à 5 µm	(%)		
Coefficient d'écoulement	LC 21-075	(%)	
Proctor modifié	NQ 2501-255	(kg/m³)	
		(W%)	
		Méthode	
		AASHTO	

Remarques : - Échantillonnage effectué selon la norme CSA A23,2-1A

Vérifié par : Marc Brizard

Approuvé par : Marc Brizard

Date : 2022-05-16

N/Réf. : LG017 (R05 20-10-10)

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CEMENT TEST REPORT

Joliette Plant

Blended general use hydraulic cement

Type GUb-8SF (HSF)

Production period: July 2022

TEST	RESULTS	REQUIREMENTS	TEST METHOD
CHEMICAL (%)			
Alkali (Na2O equi.)	0,70		ASTM C114
Loss on ignition (LOI)	3,5	≤ 3.5	CSA A3003
SiO_2	25,1		CSA A3003
Al_2O_3	4,3		CSA A3003
Fe_2O_3	2,9		CSA A3003
CaO	57,4		CSA A3003
MgO	1,3		CSA A3003
SO_3*	3,8	≤ 3.0	CSA A3003
Contribution des ajouts cimentaires			
Silica Fume:			
CaO	0,08		
Alkali (Na_2O equi.)	0,07		
PHYSICAL			
Blaine (m^2/kg)	618		ASTM C204
Fineness 45 μm sieve (%) retained	12,7	≤ 24	CSA A3004-A3
Autoclave expansion (%)	-0,029		CSA A3004-B5
Water expansion (%)**	0,006	≤ 0.020	CSA A3004-C5
Setting time:			
Initial (min)	151	45 ≤ (min) ≤ 480	CSA A3004-B2
Final (min)	279		
Heat of hydration 3 days (kJ/kg) ***	306		CSA A3004-B8
Heat of hydration 7 days (kJ/kg) ***	340		CSA A3004-B8
Compressive Strengths:			
at 3 days (MPa)	29,4	≥ 14.5	CSA A3004-C2
at 7 days (MPa)	37,8	≥ 20.0	CSA A3004-C2
at 28 days (MPa)	49,9	≥ 26.5	CSA A3004-C2

Comments

Parameters with no requirement listed are included for information purposes only, and are not required by the standards.
* Compliant with A3004-C5 Test method for determination of expansion of hydraulic cement mortar bars due to internal cement sulphate attack limit of 0.020%.
** Result from June *** Results from March

Above results indicate that the cement represented by this sample complies with all requirements of current specification CSA A3001-18.
For more information concerning the cement test report, please contact your representative

DATE	Prepared by:
August 30, 2022	Martin Perron Chief of quality department

Safety Data Sheet Portland Lime Cement

Section 1. Identification

GHS product identifier: Portland Lime Cement
Chemical name: Calcium compounds, calcium silicate compounds, and other calcium compounds make up the majority of this product.
Other means of identification: Portland Lime Masonry, Hydraulic Cement, Portland Hydraulic Lime Cement, Portland Lime
Relevant identified uses of the substance or mixture and uses advised against: Building materials, construction, a basic ingredient in construction products.

Supplier's details: 300 E. John Carpenter Freeway, Suite 1645
Irving, TX 75062
(972) 653-5500

Emergency telephone number (24 hours): **CHEMTREC: (800) 424-9300**

Section 2. Hazards Identification

Overexposure to cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry cement.

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture:
SKIN SENSITIZATION – Category 1; H314
CARCINOGENICITY – Category 1A; H350
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) – Category 2; H335
SKIN CORROSION/IRRITATION – Category 1C; H314
SERIOUS EYE DAMAGE/EYE IRRITATION – Category 1; H318

GHS label elements

Hazard pictograms:

Signal word: Danger
Hazard statements:
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause respiratory irritation.
May cause cancer.

Precautionary statements:
Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust. Use outdoors in a well ventilated area. Wash any exposed body parts thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.Contaminated clothing must not be allowed out of the workplace.
Response: If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs.If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do.If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.
Storage: Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container or vessel that stores or contains portland lime cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.
Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazards not otherwise classified None known

(HNOC):

Supplemental Information: Respirable Crystalline Silica (RCS) may cause cancer. Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC and NTP; ACGIH states that it is a suspected cause of cancer. Other forms of RCS (e.g., tridymite and cristobalite) may also be present or formed under certain industrial processes.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture
Chemical Name: Calcium compounds, calcium silicate compounds, and other calcium compounds make up the majority of this product.

CAS number/other identifiers

Ingredient name	%	CAS number
Portland Cement	50-75%	65997-15-1
Hydrated Lime	25-50%	1305-62-2
The structure of may contain the following in some concentration ranges:		
Calcium oxide	0-3	1305-78-8
Calcium hydroxide	15-35	1305-62-0
Quartz	0-0.1	14808-60-7
Gypsum	0-5	13397-24-5
Limestone	0-15	1317-65-3
Magnesium oxide	0-4	1309-48-4
Gypsum, limestone and magnesium oxide are not classifiable as a hazard under Title 29 Code of Federal Regulations 1910.1200.		
Hexavalent chromium*	Trace	18450-29-9

***Hexavalent chromium is included due to dermal sensitivity associated with the component.**

Any concentration shown as a range is to protect confidentiality or is due to process variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye Contact: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.

Inhalation: Seek medical help if coughing or other symptoms persist. Inhalation of large amounts of portland lime cement requires immediate medical attention. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the individual is not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in a recovery position and get medical attention immediately. Maintain an open airway.

Skin Contact: Get medical attention immediately. Heavy exposure to portland lime cement dust, wet mortar or associated water requires prompt attention. Quickly remove contaminated clothing, shoes, and leather goods such as watchbands and belts. Quickly and gently blot or brush away excess portland lime cement. Immediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH natural soap. Seek medical attention for rashes, burns, irritation, dermatitis and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement. Burns should be treated as caustic burns. Portland lime cement causes skin burns with little warning. Discomfort or pain cannot be relied upon to alert a person to a serious injury. You may not feel pain or the severity of the burn until hours after the exposure. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure.

Ingestion: Get medical attention immediately. Call a poison center or physician. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. Stop giving water if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed potential acute health effects

Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: Adverse symptoms may include the following: pain, watering and redness
Inhalation: Adverse symptoms may include the following: respiratory tract irritation and coughing
Skin contact: Adverse symptoms may include the following: pain or irritation, redness and blistering may occur, skin burns, ulceration and necrosis may occur
Ingestion: Adverse symptoms may include the following: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments: Not applicable.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media: Do not use water jet or water-based fire extinguishers.
Specific hazards arising from the chemical: No specific fire or explosion hazard.
Hazardous thermal decomposition Products: Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides and metal oxide/oxides
Special protective actions for fire-fighters: Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Avoid touching or walking through spilled material. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders: For personal protective clothing requirements, please see Section 8.
Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has entered the environment, including waterways, soil or air. Materials can enter waterways through drainage systems.

Methods and materials for containment and cleaning up

Small spill: Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled

	material in a designated, labeled waste container. Dispose of waste material by using a licensed waste disposal contractor.
Large spill:	Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place dust in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Large spills to waterways may be hazardous due to alkalinity of the product. Dispose of waste material using a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures:	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure by obtaining and following special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material and keep the container tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities:	A key to using the product safely requires the user to recognize that portland lime cement reacts chemically with water to produce calcium hydroxide which can cause severe chemical burns. Every attempt should be made to avoid skin and eye contact with portland lime cement. Do not get portland lime cement inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with cement mixtures. Launder/clean clothing and shoes before reuse. Do not enter a confined space that stores or contains portland lime cement unless appropriate procedures and protection are available. Portland cement can build up or adhere to the walls of a confined space and then release or fall suddenly (engulfment).

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Particulates not otherwise classified (CAS SEQ250)	**ACGIH TLV (United States, Canada)** TWA: 3 mg/m³. Form: Respirable particles TWA: 10 mg/m³. Form: Inhalable particles **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Portland Cement	**ACGIH TLV (United States and Canada)** TWA: 1 mg/m³. Form: Respirable dust **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Calcium oxide	**ACGIH TLV (United States and Canada)** TWA: 2 mg/m³ 8 hours **OSHA/MSHA PEL (United States)** TWA: 5 mg/m³ 8 hours.
Calcium Hydroxide	**ACGIH TLV (United States, Canada)** TWA: 5 mg/m³. Form: Respirable particles **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Limestone	**ACGIH TLV (United States, Canada)** TWA: 3 mg/m³. Form: Respirable particles TWA: 10 mg/m³. Form: Inhalable particles **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Magnesium oxide	**ACGIH TLV (United States and Canada)** TWA: 10 mg/m³ 8 hours. Form: Inhalable fraction **OSHA PEL (United States)** TWA: 15 mg/m³ 8 hours. Form: Total particulates
Calcium sulfate (gypsum)	**ACGIH TLV (United States, Canada)** TWA: 10 mg/m³ 8 hours. Form: Respirable fraction **OSHA PEL Z-1 (United States)** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Crystalline Silica (Quartz) (CAS 14808-60-7)	**ACGIH TLV (United States)** TWA: 0.025 mg/m³. Form: Respirable fraction **OSHA PEL (United States)** TWA: 0.05 mg/m³. Form: Respirable **MSHA PEL (United States)** TWA: 10/(%SiO2 + 2) in mg/m3 **Provincial Exposure Limits (Canada, various)** ▪ **Alberta (OHS Code)** 0.025 mg/m³ 8 hour TWA ▪ **British Columbia (WorkSafeBC OHS Regulation)** 0.025 mg/m³ 8 hour TWA ▪ **British Columbia (Health, Safety & Reclamation Code, Mines Act)** 0.1 mg/m³ 8 hour TWA ▪ **Manitoba (Workplace Safety and Health Regulation)** 0.025 mg/m³ 8 hour TWA ▪ **New Brunswick**

	0.025 mg/m³ 8 hour TWA ▪ **Newfoundland** 0.025 mg/m³ 8 hour TWA ▪ **Nova Scotia** 0.025 mg/m³ 8 hour TWA ▪ **Ontario (O. Reg 490/09; and O. Reg. 833)** 0.1 mg/m³ 8 hour TWA ▪ **Prince Edward Island** 0.025 mg/m³ 8 hour TWA ▪ **Quebec (Regulation Respecting OHS, Chapter S-2.1, r. 13)** 0.1 mg/m³ 8 hour TWA ▪ **Saskatchewan (OHS Regulations)** 0.05 mg/m³ 8 hour TWA

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Exposure guidelines: OSHA PELs, MSHA PELs, Canadian Provincial OELs, and ACGIH TLVs are 8-hr TWA values. Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled. Terms including "Particulates Not Otherwise Classified," "Particulates Not Otherwise Regulated," Particulates Not Otherwise Specified," and "Inert or Nuisance Due" are often used interchangeably; however, the user should review each agency's terminology for differences in meanings.

Individual protection measures

Hygiene measures: Clean water should always be readily available for skin and (emergency) eye washing. Periodically wash areas contacted by portland lime cement with a pH neutral soap and clean, uncontaminated water. If clothing becomes saturated with portland lime cement, garments should be removed and replaced with clean, dry clothing.

Eye/face protection: To prevent eye contact, wear safety glasses with side shields, safety goggles or face shields when handling dust or wet cement. Wearing contact lenses when working with cement is not recommended.

Skin protection

Hand protection: Use impervious, waterproof, abrasion and alkali-resistant gloves. Do not rely on barrier creams in place of impervious gloves. Do not get portland lime cement inside gloves.

Body protection: Use impervious, waterproof, abrasion and alkali-resistant boots and protective long-sleeved and long-legged clothing to protect the skin from contact with wet cement. To reduce foot and ankle exposure, wear impervious boots that are high enough to prevent cement from getting inside them. Do not get cement inside boots, shoes, or gloves. Remove clothing and protective equipment that becomes saturated with cement and immediately wash exposed areas of the body.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.

Respiratory protection: Use properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product, and assigned protection factor of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical State:	Solid. [Powder]	**Lower and Upper explosive flammable limits**	Not applicable
Color:	Gray or white	**Vapor pressure:**	Not applicable
Odor:	Odorless	**Vapor density:**	Not applicable
Odor threshold:	Not available	**Relative density:**	2.3 to 3.1
pH:	>11.5 [Conc. (% w/w): 1%]	**Solubility:**	Slightly soluble in water
Melting point:	Not available	**Solubility in water:**	0.1 to 1%
Boiling point:	>1000°C (>1832°F)	**Partition coefficient: n-octanol/water:**	Not applicable
Flash point:	Not flammable. Not combustible.	**Auto-ignition temperature:**	Not applicable

Burning time:	Not available	**Decomposition temperature:**	Not available
Burning rate:	Not available	**SADT:**	Not available
Evaporation Rate:	Not applicable	**Viscosity:**	Not applicable
Flammability (solid, gas):	Not applicable		

Section 10. Stability and reactivity

Reactivity: Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete.

Chemical Stability: The product is stable.

Possibility of hazardous reactions: Under normal circumstances of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials, acids, aluminum and ammonium salt. Portland lime cement is highly alkaline and will react with acids to produce a violent, heat-generating reaction. Toxic gases or vapors may be given off depending on the acid involved. Reacts with acids, aluminum metals and ammonium salts. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silicates dissolve readily in hydrofluoric acid producing a corrosive gas-silicon tetrafluoride.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity: Portland Lime Cement LD50/LC50 = Not available

Irritation/Corrosion: **Skin:** May cause skin irritation. May cause serious burns in the presence of moisture.
Eyes: Causes serious eye damage. May cause burns in the presence of moisture.
Respiratory: May cause respiratory tract irritation.

Sensitization: May cause sensitization due to the potential presence of trace amounts of hexavalent chromium.

Mutagenicity: There are no data available.

Carcinogenicity:
Classification below:

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Portland Lime Cement, chemicals	-	-	A4	-
Crystalline Silica (Quartz) (CAS 14808-60-7)	Listed	1	A2	Known to be a human carcinogen.

Reproductive toxicity: There are no data available.

Teratogenicity: There are no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of Exposure	Target Organs
Calcium oxide	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation
Portland Lime Cement chemicals	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of Exposure	Target Organs
Crystalline Silica (Quartz) (CAS 14808-60-7)	Category 1	Inhalation	Respiratory tract and kidneys

Aspiration hazard: There are no data available.

Information on the likely routes of exposure

Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects:
Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics:
Eye contact: Adverse symptoms may include the following: pain, watering, redness.
Inhalation: Adverse symptoms may include the following: respiratory tract irritation, coughing
Skin contact: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, skin burns, ulcerations and necrosis may occur
Ingestion: Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure:
Short term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Long term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects:
General: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. If sensitized to hexavalent chromium, a severe allergic dermal reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: Portland lime cement is not classifiable as a human carcinogen. Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity. Excessive exposure to crystalline silica can cause silicosis, a non-cancerous lung disease.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity: Acute toxicity estimates: There are no data available.

Section 12. Ecological Information

Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium oxide	Chronic NOEC 100 mg/L Fresh water	Fish-Oreochromis niloticus-Juvenile (Fledgling, Hatchling, Weanling)	46 days

Persistence and degradability: There are no data available.
Bioaccumulative potential: There are no data available.
Mobility in soil: Soil/water partition coefficient (Koc): Not available.
Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Untreated waste should not be released to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe manner. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff, and contact with soil, waterways, drains and sewers.

Section 14. Transportation information

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	None	None	None
Canada TDG	-	-	-
Additional information	-	-	-

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory Information

TSCA 6 final risk management: Chromium, ion (Cr6+)
United States inventory (TSCA 8b): Cements are considered to be statutory mixtures under TSCA. CAS 65997-15-1 is included on the TSCA inventory.
CERCLA: This product is not listed as a CERCLA substance
Clean Air Act Section 112 (b): Hazardous Air Pollutants (HAPs) – Not listed
Clean Air Act Section 602: Class I Substances - Not listed
Clean Air Act Section 602: Class II Substances - Not listed
DEA List I Chemicals: (Precursor Chemicals) – Not listed
DEA List II Chemicals: (Essential Chemicals) – Not listed
Canada NSNR Status – Listed on DSL or exempt

SARA 311/312

Classification: Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium oxide	0-3	No	No	No	Yes	No
Quartz	>0.1	No	No	No	No	Yes
Chromium, ion (Cr6+)	<0.1	No	No	No	Yes	Yes

SARA 313

	Product name	CAS number	%

Form R-Report requirements	Chromium, ion (Cr6+)	8540-29-9	<0.1

State regulations

Massachusetts: The following components are listed: cement, portland lime, chemicals, limestone
New York: None of the components are listed.
New Jersey: The following components are listed: cement, portland lime, chemicals, gypsum, limestone
Pennsylvania: The following components are listed: cement, portland lime, chemicals, gypsum, limestone

California Prop. 65

WARNING: This product contains crystalline silica and chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the above warning in the absence of definitive testing to prove the defined risks do not exist.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Quartz	Yes	No	No.	No.
Chromium, ion (Cr6+)	Yes	Yes	0.001µg/day (inhalation)	8.2 micrograms/day (ingestion)

International regulations

International lists: **Canadian Domestic Substances List (DSL):** Portland lime cement is included on the DSL.
Mexico Inventory (INSQ): All components are listed or exempted.

WHMIS Classification: D2A "Materials Causing Other Toxic Effects"

Section 16. Other Information

Date of issue: 01/01/2022
Replaces: 07/01/2018
Revised Section(s): Section 8, 11, 14, 15

Notice to reader

While the information provided in this safety data sheet is believed to provide a useful summary of the hazards of portland lime cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product. In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland lime cement to produce portland lime cement products. Users should review other relevant material safety data sheets before working with this portland lime cement or working on portland lime cement products, for example, portland lime cement mortar.

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY Lehigh Hanson, except that the product shall conform to contracted specifications. The information provided herein was believed by the Lehigh Hanson to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

Abbreviations

ACGIH — American Conference of Governmental Industrial Hygienists
CAS — Chemical Abstract Service
CERCLA — Comprehensive Emergency Response and Comprehensive Liability Act
CFR — Code of Federal Regulations
DOT — Department of Transportation
GHS — Globally Harmonized System

HEPA — High Efficiency Particulate Air
IATA — International Air Transport Association
IARC — International Agency for Research on Cancer
IMDG — International Maritime Dangerous Goods
NIOSH — National Institute of Occupational Safety and Health
NOEC — No Observed Effect Concentration
NTP — National Toxicology Program
OSHA — Occupational Safety and Health Administration
PEL — Permissible Exposure Limit
REL — Recommended Exposure Limit
RQ — Reportable Quantity
SARA — Superfund Amendments and Reauthorization Act
SDS — Safety Data Sheet
TLV — Threshold Limit Value
TPQ — Threshold Planning Quantity
TSCA — Toxic Substances Control Act
TWA — Time-Weighted Average
UN — United Nations

Safety Data Sheet Slag Cement

Section 1. Identification

GHS product identifier: Slag Cement

Chemical name: Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.

Other means of identification: Cement, Slag, ALLCEM, Type S Cement, Granulated Blast-Furnace Slag Cement, Ground Granulated Blast-Furnace Slag, GGBFS, Iron Slag Cement, Granular Pig Iron Slag Cement, Granular Water Granulated Slag Cement, Water Granulated Blast-Furnace Slag Cement

Relevant identified uses of the substance or mixture and uses advised against: Building materials, construction, a basic ingredient in concrete.

Supplier's details:
300 E. John Carpenter Freeway, Suite 1645
Irving, TX 75062
(972) 653-5500

Emergency telephone number (24 hours): **CHEMTREC: (800) 424-9300**

Section 2. Hazards Identification

Overexposure to cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry cement.

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
SKIN SENSITIZATION – Category 1; H314
CARCINOGENICITY – Category 1A; H350
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) – Category 2; H335
SKIN CORROSION/IRRITATION – Category 1C; H314
SERIOUS EYE DAMAGE/EYE IRRITATION – Category 1; H318

GHS label elements

Hazard pictograms:

Signal word: Danger

Hazard statements:
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause respiratory irritation.
May cause cancer.

Precautionary statements:

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust. Use outdoors in a well ventilated area. Wash any exposed body parts thouroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.Contaminated clothing must not be allowed out of the workplace.

Response: If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs.If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse cotinously with water for several minutes. Remove contact lenses, if present and easy to do.If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.

Storage: Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container or vessel that stores or contains slag cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazards not otherwise classified

(HNOC): None known

Supplemental Information: Respirable Crystalline Silica (RCS) may cause cancer. Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC and NTP; ACGIH states that it is a suspected cause of cancer. Other forms of RCS (e.g., tridymite and cristobalite) may also be present or formed under certain industrial processes.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture
Chemical Name: Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.

CAS number/other identifiers

Ingredient name	%	CAS number
Slags	100%	65997-15-1
The structure may contain the following in some concentration ranges:		
Calcium oxide	0-5	1305-78-8
Quartz	0-0.1	14808-60-7
Magnesium oxide	0-4	1309-48-4
Hexavalent chromium*	Trace	18450-29-9

***Hexavalent chromium is included due to dermal sensitivity associated with the component.**

Any concentration shown as a range is to protect confidentiality or is due to process variation. Slag is a nonmetallic byproduct from the production or iron. Trace amounts of chemicals may be detected during chemical analysis.
*Hexavalent chromium is included due to dermal sensitivity associated with the component.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye Contact: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.

Inhalation: Seek medical help if coughing or other symptoms persist. Inhalation of large amounts of slag cement requires immediate medical attention. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the individual is not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in a recovery position and get medical attention immediately. Maintain and open airway.

Skin Contact: Get medical attention immediately. Heavy exposure to cement slag dust, wet concrete or associated water requires prompt attention. Quickly remove contaminated clothing, shoes, and leather goods such as watchbands and belts. Quickly and gently blot or brush away excess cement. Immediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH natural soap. Seek medical attention for rashes, burns, irritation, dermatitis and prolonged unprotected exposures to wet slag cement, slag cement mixtures or liquids from wet slag cement. Burns should be treated as caustic burns. Slag cement causes skin burns with little warning. Discomfort or pain cannot be relied upon to alert a person to a serious injury. You may not feel pain or the severity of the burn until hours after the exposure. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure.

Ingestion: Get medical attention immediately. Call a poison center or physician. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. Stop giving water if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed potential acute health effects

Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: Adverse symptoms may include the following: pain, watering and redness
Inhalation: Adverse symptoms may include the following: respiratory tract irritation and coughing
Skin contact: Adverse symptoms may include the following: pain or irritation, redness and blistering may occur, skin burns, ulceration and necrosis may occur
Ingestion: Adverse symptoms may include the following: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments: Not applicable.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media: Do not use water jet or water-based fire extinguishers.
Specific hazards arising from the chemical: No specific fire or explosion hazard.
Hazardous thermal decomposition Products: Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides and metal oxide/oxides
Special protective actions for fire-fighters: Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders: For personal protective clothing requirements, please see Section 8.
Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has entered the environment, including waterways, soil or air. Materials can enter waterways through drainage systems.

Methods and materials for containment and cleaning up

Small spill: Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of waste material by using a licensed waste disposal contractor.

Large spill: Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place dust in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Large spills to waterways may be hazardous due to alkalinity of the product. Dispose of waste material using a licensed waste disposal contractor. Note: see section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure by obtaining and following special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material and keep the container tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: A key to using the product safely requires the user to recognize that slag cement reacts chemically with water to produce calcium hydroxide which can cause severe chemical burns. Every attempt should be made to avoid skin and eye contact with slag cement. Do not get slag cement inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with slag cement mixtures. Launder/clean clothing and shoes before reuse. Do not enter a confined space that stores or contains slag cement unless appropriate procedures and protection are available. Slag cement can build up or adhere to the walls of a confined space and then release or fall suddenly (engulfment).

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Particulates not otherwise classified (CAS SEQ250)	**ACGIH TLV (United States, Canada)** TWA: 3 mg/m³. Form: Respirable particles TWA: 10 mg/m³. Form: Inhalable particles **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Calcium oxide	**ACGIH TLV (United States and Canada)** TWA: 2 mg/m³ 8 hours **OSHA/MSHA PEL (United States)** TWA: 5 mg/m³ 8 hours.
Magnesium oxide	**ACGIH TLV (United States and Canada)** TWA: 10 mg/m³ 8 hours. Form: Inhalable fraction **OSHA PEL (United States)** TWA: 15 mg/m³ 8 hours. Form: Total particulates
Crystalline Silica (Quartz) (CAS 14808-60-7)	**ACGIH TLV (United States)** TWA: 0.025 mg/m³. Form: Respirable fraction **OSHA PEL (United States)** TWA: 0.05 mg/m³. Form: Respirable **MSHA PEL (United States)** TWA: 10/(%SiO2 + 2) in mg/m3 **Provincial Exposure Limits (Canada, various)** ▪ **Alberta (OHS Code)** 0.025 mg/m³ 8 hour TWA

	▪ **British Columbia (WorkSafeBC OHS Regulation)** 0.025 mg/m³ 8 hour TWA ▪ **British Columbia (Health, Safety & Reclamation Code, Mines Act)** 0.1 mg/m³ 8 hour TWA ▪ **Manitoba (Workplace Safety and Health Regulation)** 0.025 mg/m³ 8 hour TWA ▪ **New Brunswick** 0.025 mg/m³ 8 hour TWA ▪ **Newfoundland** 0.025 mg/m³ 8 hour TWA ▪ **Nova Scotia** 0.025 mg/m³ 8 hour TWA ▪ **Ontario (O. Reg 490/09; and O. Reg. 833)** 0.1 mg/m³ 8 hour TWA ▪ **Prince Edward Island** 0.025 mg/m³ 8 hour TWA ▪ **Quebec (Regulation Respecting OHS, Chapter S-2.1, r. 13)** 0.1 mg/m³ 8 hour TWA ▪ **Saskatchewan (OHS Regulations)** 0.05 mg/m³ 8 hour TWA

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures: Clean water should always be readily available for skin and (emergency) eye washing. Periodically wash areas contacted by slag cement with a pH neutral soap and clean, uncontaminated water. If clothing becomes saturated with slag cement, garments should be removed and replaced with clean, dry clothing.

Eye/face protection: To prevent eye contact, wear safety glasses with side shields, safety goggles or face shields when handling dust or wet slag cement. Wearing contact lenses when working with slag cement is not recommended.

Skin protection

Hand protection: Use impervious, waterproof, abrasion and alkali-resistant gloves. Do not rely on barrier creams in place of impervious gloves. Do not get slag cement inside gloves.

Body protection: Use impervious, waterproof, abrasion and alkali-resistant boots and protective long-sleeved and long-legged clothing to protect the skin from contact with wet slag cement. To reduce foot and ankle exposure, wear impervious boots that are high enough to prevent slag cement from getting inside them. Do not get slag cement inside boots, shoes, or gloves. Remove clothing and protective equipment that becomes saturated with slag cement and immediately wash exposed areas of the body.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.

Respiratory protection: Use properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product, and assigned protection factor of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical State:	Solid. [Powder]	**Lower and Upper explosive flammable limits**	Not applicable
Color:	Gray or white	**Vapor pressure:**	Not applicable
Odor:	Odorless	**Vapor density:**	Not applicable
Odor threshold:	Not available	**Relative density:**	2.3 to 3.1
pH:	8-11 [Conc. (% w/w): 1%]	**Solubility:**	Slightly soluble in water
Melting point:	Not available	**Solubility in water:**	0.1 to 1%
Boiling point:	>1000°C (>1832°F)	**Partition coefficient: n-octanol/water:**	Not applicable

Flash point:	Not flammable. Not combustible	**Auto-ignition temperature:**	Not applicable
Burning time:	Not available	**Decomposition temperature:**	Not available
Burning rate:	Not available	**SADT:**	Not available
Evaporation Rate:	Not applicable	**Viscosity:**	Not applicable
Flammability (solid, gas):	Not applicable		

Section 10. Stability and reactivity

Reactivity: Reacts slowly with water forming silicates and calcium hydroxide.

Chemical Stability: The product is stable.

Possibility of hazardous reactions: Under normal circumstances of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials, acids, aluminum and ammonium salt. Toxic gases or vapors may be given off depending on the acid involved. Reacts with acids, aluminum metals and ammonium salts. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silicates dissolve readily in hydrofluoric acid producing a corrosive gas-silicon tetrafluoride.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity: Slag Cement LD50/LC50 = Not available

Irritation/Corrosion: **Skin:** May cause skin irritation. May cause serious burns in the presence of moisture.
Eyes: Causes serious eye damage. May cause burns in the presence of moisture.
Respiratory: May cause respiratory tract irritation.

Sensitization: May cause sensitization due to the potential presence of trace amounts of hexavalent chromium.

Mutagenicity: There are no data available.

Carcinogenicity:
Classification below:

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Crystalline Silica (Quartz) (CAS 14808-60-7)	Listed	1	A2	Known to be a human carcinogen.

Reproductive toxicity: There are no data available.

Teratogenicity: There are no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of Exposure	Target Organs
Calcium oxide	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of Exposure	Target Organs
Crystalline Silica (Quartz) (CAS 14808-60-7)	Category 1	Inhalation	Respiratory tract and kidneys

Aspiration hazard: There are no data available.

Information on the likely routes of exposure

Potential acute health effects:
Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics:
Eye contact: Adverse symptoms may include the following: pain, watering, redness.
Inhalation: Adverse symptoms may include the following: respiratory tract irritation, coughing
Skin contact: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, skin burns, ulcerations and necrosis may occur
Ingestion: Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure:
Short term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Long term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects:
General: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. If sensitized to hexavalent chromium, a severe allergic dermal reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: Slag cement is not classifiable as a human carcinogen. Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity. Excessive exposure to crystalline silica can cause silicosis, a non-cancerous lung disease.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity: Acute toxicity estimates: There are no data available.

Section 12. Ecological Information

Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium oxide	Chronic NOEC 100 mg/L Fresh water	Fish-Oreochromis niloticus-Juvenile (Fledgling, Hatchling, Weanling)	46 days

Persistence and degradability: There are not data available.
Bioaccumulative potential: There are not data available.
Mobility in soil: Soil/water partition coefficient (Koc): Not available.
Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods:
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Untreated waste should not be released to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe manner. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff, and contact with

soil, waterways, drains and sewers.

Section 14. Transportation information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	None.	None.	None.
Canada TDG	-	-	-
Additional information	-	-	-

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory Information

TSCA 6 final risk management: Chromium, ion (Cr6+)
United States inventory (TSCA 8b): Cements are considered to be statutory mixtures under TSCA. **CERCLA:** This product is not listed as a CERCLA substance
Clean Air Act Section 112 (b): Hazardous Air Pollutants (HAPs) – Not listed
Clean Air Act Section 602: Class I Substances - Not listed
Clean Air Act Section 602: Class II Substances - Not listed
DEA List I Chemicals: (Precursor Chemicals) – Not listed
DEA List II Chemicals: (Essential Chemicals) – Not listed
Canada NSNR Status – Listed on DSL or exempt

SARA 311/312

Classification: Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium oxide	0-5	No	No	No	Yes	No
Quartz	>0.1	No	No	No	No	Yes
Chromium, ion (Cr6+)	<0.1	No	No	No	Yes	Yes

SARA 313

	Product name	CAS number	%
Form R-Report requirements	Chromium, ion (Cr6+)	8540-29-9	<0.1

State regulations

Massachusetts: Listed
New York: None of the components are listed.
New Jersey: Listed
Pennsylvania: Listed

California Prop. 65

WARNING: This product contains crystalline silica and chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the above warning in the absence of definitive testing to prove the defined risks do not exist.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Quartz	Yes	No	No	No
Chromium, ion (Cr6+)	Yes	Yes	0.001µg/day (inhalation)	8.2 micrograms/day (ingestion)

International regulations

International lists: **Canadian Domestic Substances List (DSL):** Portland cement is included on the DSL.
ECC – EINECS: Listed

WHMIS Classification: D2A "Materials Causing Other Toxic Effects"

Section 16. Other Information

Date of issue: 01/01/2022
Replaces: 07/01/2018
Revised Section(s): Section 8, 11, 14, 15

Notice to reader

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UN — United Nations

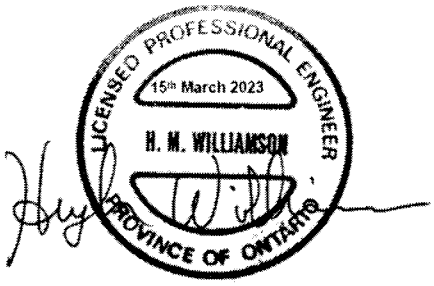
SONAIR
ENVIRONMENTAL

SECTION 3

ACOUSTIC ASSESSMENT REPORT (AAR)

FREEFIELD LTD.
Ottawa, Ontario

ACOUSTIC ASSESSMENT FOR THE PORTABLE BATCHING CONCRETE PLANT CHALK RIVER, ONTARIO



PEO License No. 90532110

Prepared for

Bird Construction Industrial Services Ltd.

Prepared by

Freefield Ltd.

15th March 2023

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ACOUSTIC ASSESSMENT FOR THE PORTABLE BATCHING CONCRETE PLANT CHALK RIVER, ONTARIO

Executive Summary

Bird Construction Industrial Services Ltd. (BCIS) is applying to the Ministry of Environment, Conservation and Parks (MECP) for a site wide Environmental Compliance Approval (ECA) for the proposed ready-mix concrete batch plant (PBC Plant), to be located at Part Lot 3 and Lot 4, Concession 8, Municipality of Laurentian Hills, Renfrew County, Ontario, as shown in Figures 1 and 2.

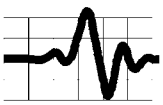
The North American Industry Classification System (NAICS) code for the facility is 327320.

The MECP ECA application requires the submission of an acoustic assessment report. Freefield Ltd. has been retained by BCIS to complete this acoustic assessment.

The acoustic assessment has been carried out according to the applicable MECP Noise Assessment Guidelines, including NPC-300, published August 2013. The assessment considers the impacts on nearby noise sensitive lands, including existing residences and land zoned for potential noise sensitive use, of noise generated by all significant on-site equipment operations. The site is not a significant source of vibration therefor an assessment of vibration impacts is not required.

Noise impacts have been predicted and compared to the MECP sound level limits as set out in NPC-300. Where applicable, noise mitigation measures, such as barriers and limits to operations, have been designed to ensure all operations are in compliance with the applicable sound level limits.

Assessment methodology is provided in Section 1. A detailed description of the facility and its operations is provided in Section 2. Noise sources associated with operations at the facility are summarized in Section 3. Critical receptors are described in Section 1 and Section 4, with Section 5, 6 and 7 detailing applicable assessment criteria, an assessment of noise impacts and the recommended mitigation measures.



Version Control

Title	Comments	Prepared By	Issue Date
Acoustic Assessment for the Portable Batching Concrete Plant, Chalk River, Ontario	Issued to client	Freefield Ltd.	5th November 2022
Acoustic Assessment for the Portable Batching Concrete Plant, Chalk River, Ontario	Updated to incorporate revised dust collector location	Freefield Ltd.	15th March 2023 (This Version)

ACOUSTIC ASSESSMENT FOR THE PORTABLE BATCHING CONCRETE PLANT CHALK RIVER, ONTARIO

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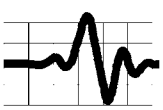

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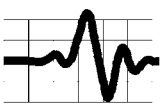


ACOUSTIC ASSESSMENT FOR THE PORTABLE BATCHING CONCRETE PLANT CHALK RIVER, ONTARIO

1.0 Introduction

Bird Construction Industrial Services Ltd. (BCIS) is applying to the Ministry of Environment, Conservation and Parks (MECP) for a site wide Environmental Compliance Approval (ECA) for the proposed portable batching concrete plant (PBC Plant), to be located at Part Lot 3 and Lot 4, Concession 8, Municipality of Laurentian Hills, Renfrew County, Ontario, as shown in Figures 1 and 2.

The North American Industry Classification System (NAICS) code for the facility is 327320.

This report describes an assessment carried out by Freefield Ltd. of the potential impact of noise from on-site operations on nearby noise sensitive receptors in accordance with MECP guidelines for stationary noise sources. [1, 2]

This report has been prepared in accordance with the MECP Document NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995. Noise from the facility is assessed according to MECP Documents: NPC-300, *Stationery and Transportation Sources – Approval and Planning*, August 2013.[1] This report follows the recommended format contained in, *Sample Application Package, Basic Comprehensive Certificate of Approval (Air)*, July 2009.[2]

The noise assessment methodology is summarised below.

- Identification of noise sensitive receptors in the vicinity of the facility. Potential noise sensitive receptors include residences, motels, places of worship, schools, hospitals and vacant land zoned for potential noise sensitive use.

- Determination of the MECP sound level limits[1] which apply at each of the noise sensitive receptors.

- Identification of the sources of noise that will arise from the facility's operations. In the current study, the strengths of the various noise sources were obtained from noise measurements of similar operations at other facilities in Ontario by Freefield Ltd.

- Based on the strengths of the individual noise sources, noise levels due to the facility's operations are predicted at nearby noise sensitive receptors using a prediction procedure[6] which is favoured by the MECP. The MECP methodology requires that compliance be assessed under predictable "worst case" conditions for normal operations.

- Assessment of compliance of the noise due to on-site operations with MECP sound level limits. Where appropriate mitigation measures are recommended such that compliance, with MECP sound level limits, is achieved at all receptors.

Note that this assessment considers all significant noise sources in operation at the facility. The facility is not a significant source of vibration therefore an assessment of vibration impacts is not required.

Surrounding Lands, Acoustic Environment and Critical Receptors

The PBC Plant is located on the south side of Plant Road approximately 100 m east of Trans-Canada Highway 17 in the Village of Chalk River, Ontario.

Note that directions in this report are referenced to north as shown in Figure 1.

The site consists of relatively flat topography with relatively minor changes in elevation, plus minus 2 m. The eastern and western portion of the site lies at an approximate elevation of 158 mASL with the northern boundary elevation, abutting Plant Road at an approximate elevation of 157 mASL.

The land surrounding the site slopes consists of relatively flat topography with a number of localized hills / outcrops.

The legal description of the land occupied by the PBC Plant is as follows:

Part Lot 3 and Lot 4,
Concession 8,
Municipality of Laurentian Hills,
Renfrew County,
Ontario

A location plan showing the site with respect to the surrounding area is provided in Figure 1. A site layout plan, showing the sites detailed arrangement and elevation contours, is provided in Figure 2. A land use zoning map is provided in Appendix 1.

The PBC Plant is located on land zoned Rural (RU) and Highway Commercial (HC), as shown on the Zoning Maps, Appendix 1.

To the north of the site the land is zoned Residential One Zone (R1). A number of residences exist in this direction fronting Plant Road and Blinkie Street East. The closest existing residences in this direction have been selected as a critical receptor in the following assessment.

To the east of the site the land is zoned Residential One Zone (R1), Mobile Home Park Residential Zone (MHP) and Rural (RU). Shady Pines Mobile Home Park lies in this direction. The closest existing residences in this direction, located in the Shady Pines Mobile Home Park at

Candy Lane and Nature Lane, have been selected as a critical receptor in the following assessment.

South of the site the land is zoned Rural (RU) and Community Facility Zone (CF). Trans-Canada Highway 17 running in a northwest to southeast direction lies in this direction. Further south in a south easterly direction the land is zoned Rural (RU). A small number of residences exist in this direction fronting Trans-Canada Highway 17. The closest existing residence in this direction has been selected as critical receptors in the following assessment.

Immediately west of the site lies the Trans-Canada Highway 17. Further west the land is General Industrial Zone (GM) and Community Facility Zone (CF). The Canadian Pacific Railway lies immediately west of the GM and CF zoned land. Further west the land is zone Residential One Zone (R1). A number of residences exist in this direction fronting Railway Street and Kellett Street. The closest existing residences in this direction have been selected as critical receptors in the following assessment.

The critical noise sensitive receptors, which have been selected for detailed analysis, are shown in Figure 1. These were selected as being the receptors most likely impacted by noise from the facility. Other noise sensitive receptors, including vacant land zoned for potential noise sensitive use, are at greater distances and will be less affected by noise from the facility.

Table 1 lists the noise sensitive receptors selected for analysis.

2.0 Facility Description

The PBC Plant produces various grades of ready-mix concrete which are manufactured from raw materials, including sand, aggregate, powdered cement, supplements (slag and additives) and water.

The plant has a peak capacity of 120 cubic meters per hour. A detailed description of the manufacturing process is provided below.

Raw materials including sand and coarse aggregate are delivered by highway trucks and stored in stockpiles, a loader is used to feed the stockpiled material into the hopper attached to the plant. The hoppers transfer the material, via conveyor, to an elevated mixing module / aggregate bin which loads metered quantities of the sand and aggregate via conveyor into the concrete truck. During cooler operating periods a Polarmatic steam generator, with the exhaust piped through the feeds bins, is used to heat the sand and aggregate prior to it being used in production. The steam generator (boiler), and associated compressor, are located inside a steel enclosure.

The elevated mixing module is fitted with a baghouse dust collector to control dust emissions. The dust collector is typically operated for only a few minutes per load during the mixing process. For the purpose of assessing compliance, it has been assumed the dust extractor is in operation for a maximum of 30 minutes per hour.

Concrete trucks generally proceed directly to the load and mix location. At certain times concrete trucks proceed to the wash out area prior to proceeding to the load and mix location.

The concrete truck remains at the load and mix location, mixing the components for approximately 2 to 5 minutes. During this period, the trucks run at a fast idle with the concrete drum spinning to achieve the mixing.

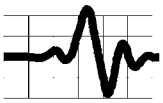
After loading and mixing the concrete trucks proceed to a slump mix station where additional water is added, as needed. This typically takes 2 to 5 minutes with the concrete drum spinning to continue the mixing process. Concrete trucks then deliver the product off-site to customers.

Cement powder and powdered slag are delivered by a specialized powder tanker truck equipped with a blower/pump to unload the cement powder or powdered slag into the silos. The blower/pump is located under the chassis of the truck, immediately behind the cab. Powder trucks typically have a capacity of 40 tons. Unloading of the cement powder or slag typically takes approximately 1 hour.

The cement and slag storage silos are fitted with filters located at the top of the silo's to control dust emissions.

Ancillary operations include administration operations occurring inside the office / control tower building.

Power to the plant will be provided by Hydro.



The site entry to the PBC Plant is from Plant Road, as shown in Figure 2. All truck traffic, including highway trucks and concrete trucks, enter and exit the site via this entrance.

Based on a peak plant production capacity of 120 cubic meters per hour it has been assumed that a maximum of 14 concrete trucks, with capacities ranging from 3 to 9 cubic meters each, enter and exit the site per hour during periods of worst-case operation during the daytime period. Typically, up to four aggregate trucks, deliver raw sand, aggregate or recycled concrete, to stockpiles located on-site, and 1 powder truck, delivering cement, slag or additives, to the silos, enter and exit the site per hour during periods of worst-case operation.

During periods of limited production, such as when operating during the evening and nighttime period, it has been assumed that a maximum of 4 concrete trucks enter and exit the site per hour. Trucks delivering cement powder, slag, sand or aggregate do not operate during the evening and nighttime period.

The following on-site equipment and processes will be operated at the PBC Plant and are included in this assessment as significant sources of noise:

- Concrete truck loading and mixing,
- Concrete truck slump test and mixing,
- Concrete truck wash-out,
- Signal horn
- Cement powder tanker truck equipped with a blower/pump to unload the cement powder or slag,
- Dust extractor,
- Noise from the compressor located inside the Polarmatic steam generator enclosure emitted to the environment through a small louvred vent at the man door,
- On-site concrete truck movements,
- On-site powder truck movements delivering powdered cement and slag,
- On-site aggregate truck movements delivering sand, aggregate or recycled concrete,
- Loader (JD544K or similar),

Hours of Operation

Daytime Operations (07:00 – 19:00) - During the daytime period, all significant noise sources are assumed to be in operation.

Evening and Nighttime Operations (19:00 – 07:00) – During the evening and nighttime period the PBC Plant is to operate with limited production. All significant noise sources are assumed to be in operation **except for the following:**

- Aggregate trucks delivery sand and aggregate to stockpiles;
- Cement powder tanker trucks equipped with a blower/pump delivering and unloading cement powder or slag;

Refer to Section 7.0 for the recommended mitigation measures that apply during the daytime, evening and nighttime periods of operation.

3.0 Noise Source Summary

The following noise sources have been used to model noise generated by operations at the PBC Plant. In brackets are the shortened names of the noise sources as used in the acoustic model. The characteristics of these sources, as used in acoustic modelling, are summarized in Table 2.

- Ready-mix concrete truck wash-out (Source: Concrete_Truck_Washout),
- Ready-mix concrete truck loading and mixing (Source: Concrete_Truck_Loading),
- Ready-mix concrete truck slump test and mixing (Source: Concrete_Truck_Slump_Mix),
- Aggregate bin / mixing module and associated dust collection system (Source: Dust_Collector),
- Noise from the compressor located inside the Polarmatic steam generator enclosure emitted to the environment through a louvred vent at the man door (Source: Polarmatic_Enclosure_Vent),
- One loader (Source: Loader),
- Powder tanker trucks unloading cement (Source: Powder_Truck_Unloading)
- Powder tanker delivering cement and slag to the silo (Source: Powder_Truck_Passby)
- Aggregate trucks unloading aggregate into stockpiles (Source: Aggregate_Truck_Unloading)
- Aggregate trucks delivering aggregate to stockpiles (Source: Aggregate_Truck_Passby),
- Ready-mix concrete trucks arriving and departing (Source: Concrete_Truck_Passby),

The PBC Plant is a new piece of equipment not currently in operation. As such, the strengths of the noise sources, i.e. the sound powers shown in Table 1 and used in this analysis, are taken from a database of noise measurements made by Freefield Ltd. of similar operations at other facilities in Ontario.

Noise from the on-site truck movements is estimated using the moving point source method and modelled as a continuous loop. It is assumed that a maximum of 14 loads of concrete will be shipped, 4 loads of sand and aggregate and 1 load of powdered cement or slag will be delivered, per hour during periods of maximum capacity during the daytime period. During the evening and nighttime period during periods of limited production, a maximum of 4 loads of concrete may be shipped. Trucks delivering cement powder, slag, sand or aggregate are not to operate during the evening and nighttime period.

Insignificant Noise Sources:

- The Polarmatic steam generator exhaust piped through the feed bins to heat the sand and aggregate.
- Conveyors used to transfer material are considered as insignificant noise sources.
- The shakers / filters located at the top of the cement and slag storage silos were assessed as insignificant noise sources.

- The auger motors located at the bottom of the cement and slag storage silo's are considered as insignificant noise sources.

Noise measurements were carried out using a Brüel & Kjær Type 2270 sound level meter. Field calibrations, using a Brüel & Kjær 4231 field calibrator, and battery checks were carried out before and after each measurement series. In no case did the field calibration vary by more than 0.1 dB over a series of measurements.

In addition, the sound level meters, and the field calibrator are laboratory calibrated on an annual basis. Copies of the relevant calibration certificates are included in Appendix 3.

The weather conditions on the day of measurements were generally well suited to outdoor noise measurements, variable winds of less than 20 km/h, skies clear and low humidity. A windshield was used during all noise measurements.

Refer to Figure 3 for the location of sources for the worst-case modes of operation analysed.

4.0 Point of Reception Summary

A total of ten nearby noise sensitive receptors have been selected for detailed noise evaluation. These existing residences are those closest to the facility in all directions and represent the worst-case noise impacts in comparison to other nearby or more distant noise sensitive receptors.

The ten points of reception selected for analysis, POR 1 to POR 10, are shown in Figure 1 and listed in Table 1.

As per MECP Guideline NPC-300, two points of reception (POR) have been selected at each residence for which worst case sound levels have been calculated.

> POW – Plane of window (POW) points of reception are located on the dwelling or noise sensitive building, typically 2 m above ground for single storey dwellings and 4.5 m above ground for two storey dwellings.
>
> OPR – Outdoor Point of Reception, an area on the property of the residence. For large properties, the OPR point of reception can be up to 30 m from the dwelling at a height of 1.5 m above ground.

5.0 Assessment Criteria, Performance Limits

Sound level limits, as specified in the MECP guideline NPC-300[1], depend on the acoustical classification of the area as Class 1, 2, 3 or 4.

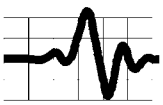
> **Class 1 area** 'an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as urban hum.'
>
> **Class 2 area** 'an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas: sound levels characteristic of Class 1 during daytime (07:00 to 19:00 or to 23:00 hours); and, low evening and night background sound level defined by natural environment and infrequent human activity starting as early as 19:00 hours (19:00 or 23:00 to 07:00 hours).'
>
> **Class 3 area** 'a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as: a small community; agricultural area; a rural resort area such as a cottage or resort area; or, a wilderness area. '
>
> **Class 4 area** 'an area or specific site that would otherwise be defined as Class 1 or 2 and which: is an area intended for development with new noise sensitive land use(s) that are not yet built; is in proximity to existing, lawfully established stationary source(s); and, has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process. Additionally, areas with existing noise sensitive land use(s) cannot be classified as Class 4 areas.'

Due to the relatively high levels of road traffic on Trans-Canada Highway 17 and the general sub-urban nature of the environment at Railway Street, Kellett Street and Plant Road, the area in which POR 3 to POR 8 are located is subject to traffic noise and other urban noise particularly during the daytime and evening hours. As such these receptors are classified as Class 2 Area.

Due to the dominant rural character of the environment at the Shady Pines Mobile Home Park and the distance to the Trans-Canada Highway the acoustical environment in which POR 1 and POR 2 are located, is dominated by natural sounds with little road traffic noise. As such, the area in which these receptors are located is classified as Class 3 Area.

For a Class 2 and Class 3 Area the applicable outdoor sound level limit at a point of reception is the higher of the applicable exclusion limit value, given in Tables 2 and Table 3, or the background sound level for that point of reception.

Background sound level means the sound level that is present in the environment, produced by noise sources other than the source under assessment. Road traffic noise is the most common source of background sound. [5-7]



An assessment of background noise was not carried out, hence, the levels given in the Tables 3 and 4 are taken as the sound level limits at all points of reception for the purpose of this assessment according to their location in a Class 2 Area or Class 3 Area.

The applicable sound level limits for each point of reception are set out in Table 5.

Sound levels are assessed in terms of the 1-hour equivalent sound level, L_{eq}, effectively the average sound level over each hour. All sound levels are A-weighted, A-weighting being a frequency weighting with represents sensitivity of human hearing to sounds of differing frequencies.

6.0 Impact Assessment

Noise levels have been predicted at the critical receptors using "predictable worst case" assumptions under normal operations and using the ISO sound propagation methodology[7] as implemented in the sound prediction software Cadna-A, Version 2022. The "predictable worst case" is interpreted as meaning the greatest noise impact anticipated under normal operating conditions. The ISO methodology provides a conservative (i.e. high) estimate of the noise level at a receptor taking into account adverse wind and meteorological conditions.

The estimation method includes the following:

- Distance attenuation is based on spherical spreading.
- Atmospheric attenuation.
- Ground attenuations, as appropriate.
- Barrier attenuation, as appropriate.

In order to consider cases of worst noise impacts, two operational scenarios have been modeled.

In general, the worst impacts are those which occur when all equipment is operating concurrently.

The following two worst-case scenarios are presented in this report and form the basis for the recommended mitigation measures and assessment of compliance to MECP criteria:

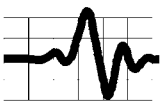
Scenario 1: *Worst Case, PBC Plant operating at maximum capacity of 10 loads of concrete per hour with all equipment in operation – **Before Noise Barriers** (Day, 7 am to 7 pm) – Figure 3 and 4.*

Scenario 2: *Worst Case, PBC Plant in operation with limited production at maximum capacity of 3 loads of concrete per hour – **Before Noise Barriers** (Evening and Nighttime Period, 7 pm to 7 am) – Figure 3 and 5.*

Scenario 3: *Worst Case, PBC Plant operating at maximum capacity of 14 loads of concrete per hour with all equipment in operation - **After Noise Barriers** (Day, 7 am to 7 pm) – Figure 3 and 6.*

Scenario 4: *Worst Case, PBC Plant in operation with limited production at maximum capacity of 4 loads of concrete per hour - **After Noise Barrier** (Evening and Nighttime Period, 7 pm to 7 am) – Figure 3 and 7.*

In Table 6.1 and 6.2, estimated noise levels at the nearest receptors for the worst-case scenarios are compared with the applicable sound level limits. More detailed estimates are contained in Appendix 2, with Tables A2.7.1, A2.7.2, A2.7.3 and A2.7.4 providing a summary of predicted noise impacts at each point of reception (POR) for the individual sources.



It can be seen that the sound level limits are met at all noise sensitive points of reception, POR 1 to POR 10, for worst case operating conditions during the proposed daytime period of operation 7 am to 7 pm (07:00 to 19:00) and evening and nighttime period of operation (19:00 to 07:00).

Details of acoustic modeling are provided in Appendix 2. Figures 4, 5, 6 and 7 show predicted noise contours for each mode of operation analyzed.

Statement of Compliance

It is concluded that, with the recommended mitigation measures detailed in section 7.0, noise impacts from operations at the PBC Plant will be in compliance with MECP Environmental Noise Guidelines[1] for the proposed daytime period of operation 7 am to 7 pm (07:00 to 19:00) and evening and nighttime period of operation (19:00 to 07:00).

7.0 Mitigation Measures (Site Plan Recommendations)

Noise mitigation measures for the PBC Plant operations are detailed below. The predicted noise impacts in Tables A2.7.1 to A2.7.4 are based on the implementation of the following mitigation measures:

7.1 Berms and Barriers at Site Boundary:

7.1.1 Noise barriers and berms are to be provided as per Table 7 and Figure 8.

7.1.2 Noise barriers are not required when operating at a maximum capacity of ten loads of concrete per hour or less.

7.1.3 Noise barriers and berms are to be solid, having no gaps, and are to have a surface density of no less than 20 kg/m2. Examples of suitable barriers or berms are as follow:

7.1.3.1 Lift face or existing terrain;
7.1.3.2 Earth, gravel or aggregate berms or stockpiles;
7.1.3.3 Concrete or brick walls;
7.1.3.4 Commercial noise barriers;
7.1.3.5 Shipping containers or buildings,
7.1.3.6 A portable barrier such as a truck trailer equipped with movable flaps to block the space between the ground and the bottom of the trailer and increase height if required. Barriers are to be set in a safe and legal manner, with consideration of ground conditions, weather, etc. which can affect how high they can be established. Additionally, blocking is to be provided covering gaps (vertical and horizontal). Blocking material is to have a surface density of no less than 20 kg/m2.

7.2 Portable Batching Concrete Plant Operations:

7.2.1 The PBC Plant may operate on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.2.1.1 When operating on-site, trucks shall not exceed 20 kph and shall not use compression braking (Jake Brakes).

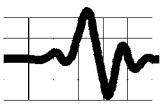
7.2.1.2 When operating during the Daytime period (07:00 to 19:00):

7.2.1.2.1 Before establishment of Barrier 1:

i. A maximum of ten (10) concrete trucks may enter and exit the site per hour.
ii. A maximum of four (4) highway trucks, delivering sand, aggregate or recycled concrete to stockpiles, may enter and exit the site per hour.
iii. A maximum of one (1) powder truck, delivering powder cement or slag to silos, may enter and exit the site per hour.

7.2.1.2.2 After establishment of Barrier 1:

iv. A maximum of fourteen (14) concrete trucks may enter and exit the site per hour.
v. A maximum of four (4) highway trucks, delivering sand, aggregate or recycled concrete to stockpiles, may enter and exit the site per hour.



vi. A maximum of one (1) powder truck, delivering powder cement or slag to silos, may enter and exit the site per hour.

7.2.1.3 When operating during the evening and nighttime period (19:00 to 07:00):

7.2.1.3.1 Before establishment of Barrier 1:

i. A maximum of three (3) concrete trucks may enter and exit the site per hour.

ii. Powder trucks delivering powder cement or slag to silos and highway trucks delivering sand, aggregate or recycled concrete to stockpiles are not to be in operation.

7.2.1.3.2 After establishment of Barrier 1:

iii. A maximum of four (4) concrete trucks may enter and exit the site per hour.

iv. Powder trucks delivering powder cement or slag to silos and highway trucks delivering sand, aggregate or recycled concrete to stockpiles are not to be in operation.

7.2 Existing Woodland:

7.2.2 The existing woodland shielding noise impacts at residences to the north and east is to be retained for a minimum depth of 100 m at the north and east site boundary in locations shown on Figure 2.

7.3 Site Preparation and Remediation:

7.3.1 Portable construction equipment used for site preparation (e.g. land clearing and construction of berms) and rehabilitation shall comply with MECP Publication NPC-115, Construction Equipment, August 1978. (This publication gives noise standards to be met by construction equipment in Ontario.) Site preparation and rehabilitation activities shall take place only during daytime hours (07:00 – 19:00).

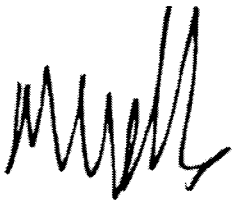
7.4 New Processes:

7.4.1 If a new process is introduced to the site, then this process shall be assessed by a qualified acoustical consultant prior to commissioning. Noise mitigation measures shall be reviewed, and altered, if necessary, to ensure that MECP sound level limits are met at all points of reception.

8.0 Conclusions

An acoustic assessment of operations at the Bird Construction Industrial Services Ltd. Portable Batching Concrete Plant to be located at Part Lot 3 and Lot 4, Concession 8, Municipality of Laurentian Hills, Renfrew County, Ontario, has been conducted according to MECP noise assessment procedures. Operations include the manufacture of various grades of concrete, the delivery of raw materials by highway truck, a loader to feed raw materials into the plant, the delivery of cement and slag or additives by cement powder tanker truck, silos to store cement powder, slag and additives, a dust extractor, a steam generator used to heat the sand and aggregate, and the shipping of product using concrete trucks.

It has been found that noise levels from the operations at nearby receptors are in compliance with MECP sound level limits as set out in publication NPC-300[1], provided that the noise mitigation measures described in Section 7.0 of this report are followed.



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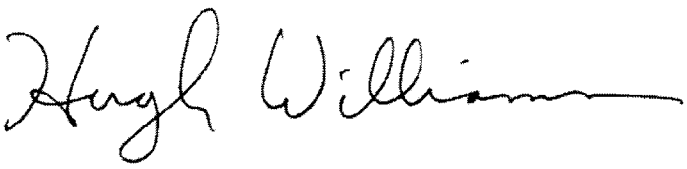

Hugh Williamson, Ph.D., P.Eng.
Member, Canadian Acoustical Society

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3. Ministry of Environment, Conservation and Parks Publication NPC-206, *Sound Levels due to Road Traffic,* October 1995.

4. Ministry of Environment, Conservation and Parks, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), 1989.

5. Ministry of Environment, Conservation and Parks, STAMSON Software, Version 5.03, 1996. (Software implementation of reference 4).

6. International Standards Organization, *Acoustics - Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation*, ISO 9613-2: 1996(E).

TABLES

Table 1: Point of Reception Summary Table*

Point of Reception	Location*
POR 1	Residence 27 Candy Lane (1-storey)
POR 2	Residence 6 Nature Lane (1-storey)
POR 3	Residence 30864 Trans-Canada Highway 17 (1-storey)
POR 4	Residence 65A Railway Street (1.5-storey) (also represents 59, 61, 63, 65, 67 and 69 Railway Street)
POR 5	Residence 7 Kellett Street (2-storey) (also represents 3 and 5 Kellett Street)
POR 6	Residence 14 Plant Road (1-storey) (also represents 8 and 10 Plant Road)
POR 7	Residence 16 Plant Road (1-storey) (also represents 8 and 10 Plant Road)
POR 8	Residence 8 Blinkie Street East (1.5-storey)
POR 9	Residence 509 Laroche Crescent (1-storey)
POR 10	Residence 510 Laroche Crescent (1.5-storey)

* For assessment purposes, points of reception, (POR), have been taken as upper floor windows (2 m above grade for single storey and 4.5 m above grade to represent two storey residences) and Outdoor Point of Receptions (30 m from Residence, 1.5 m above grade) in acoustic calculations. POR's located on vacant land have been assessed at 2 stories in height.

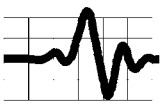


Table 2: Noise Source Summary Table

Name	Source ID	Sound Power (dBA)	Source Location				Sound Character-istics	Noise Control Measures
			Height above ground (m)*	Outside / Inside	Coordinates			
					X	Y		
Concrete_Truck_Loading	Concrete_Truck_Loading_S1	111.0	4.0	Outside	18310 860.0	50987 07.5	Steady, non-tonal, non-directional	As noted in section 7.0
Concrete_Truck_Slump_Mix	Concrete_Truck_Slump_Mix_S1	107.5	4.0	Outside	18310 871.1	50987 64.5	Steady, non-tonal, non-directional	As noted in section 7.0
Concrete_Truck_Washout	Concrete_Truck_Washout_S1	96.1	4.0	Outside	18310 902.5	50987 29.9	Steady, non-tonal, non-directional	As noted in section 7.0
Signal_Horn	Signal_Horn_S1	116.6	6.0	Outside	18310 855.2	50987 08.3	Steady, non-tonal, non-directional	As noted in section 7.0
Polarmatic_Enclosure_Vent	Polarmatic_Enclosure_Vent	100.8	1.8	Outside	18310 869.2	50986 79.3	Steady, non-tonal, non-directional	As noted in section 7.0
Dust_Collector	Dust_Collector	98.0	1.5*	Outside	18310 862.8	50987 09.1	Steady, non-tonal, non-directional	As noted in section 7.0
Powder_Truck_Unload	Powder_Truck_Unload_S1	102.2	0.8	Outside	18310 873.5	50987 15.7	Steady, non-tonal, non-directional	As noted in section 7.0
Aggregate_Truck_Unloading	Aggregate_Truck_Unloading_S1	108.1	2.5	Outside	18310 917.5	50987 07.4	Steady, non-tonal, non-directional	As noted in section 7.0
Loader	Loader	109.4	2.5	Outside	-	-	Steady, Moving, non-tonal, non-directional	As noted in section 7.0
Concrete_Truck_Passby	Concrete_Truck_Passby	106.9	4	Outside	-	-	Steady, Moving, non-tonal, non-directional	As noted in section 7.0
Powder_Truck_Passby (Powdered cement and slag delivery)	Powder_Truck_Passby	101.7	2.5	Outside	-	-	Steady, Moving, non-tonal, non-directional	As noted in section 7.0
Aggregate_Truck_Passby (Aggregate delivery)	Aggregate_Truck_Passby	86.7	2.5	Outside	-	-	Steady, Moving, non-tonal, non-directional	As noted in section 7.0

**Height measured from finished roof level of mixing module 8 m above grade.

Table 3: MECP Exclusion Limit Values for One-Hour Equivalent Sound Level (Leq, dBA) at Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

Table 4: MECP Exclusion Limit Values for One-Hour Equivalent Sound Level (Leq, dBA) at Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

Table 5: Applicable One Hour Sound Level Limits for the Daytime (07:00 – 19:00) and Evening and Nighttime Period (19:00 – 07:00) period of operation.

Receptor & Point of Reception POW = Plane of Widow OPR = Outdoor Point of Reception	Sound Level Limit 1-hour LAEQ dBA (Daytime Period, 07:00 – 19:00)*	Sound Level Limit 1-hour LAEQ dBA (Evening Period, 19:00 – 23:00)**	Sound Level Limit 1-hour LAEQ dBA (Nighttime Period, 23:00 – 07:00)*
POR 1 - POW	45	40	40
POR 1 - OPR	45	40	-
POR 2 - POW	45	40	40
POR 2 - OPR	45	40	-
POR 3 - POW	50	50	45
POR 3 - OPR	50	45	-
POR 4 - POW	50	50	45
POR 4 - OPR	50	45	-
POR 5 - POW	50	50	45
POR 5 - OPR	50	45	-
POR 6 - POW	50	50	45
POR 6 - OPR	50	45	-
POR 7 - POW	50	50	45
POR 7 - OPR	50	45	-
POR 8 - POW	50	50	45
POR 8 - OPR	50	45	-
POR 9 - POW	50	50	45
POR 9 - OPR	50	45	-

*As per NPC-300 Outdoor points of reception (OPR) are not considered noise sensitive during the nighttime period (nighttime period).

Table 6.1: Acoustic Assessment Summary Table, Worst Case, Daytime Period (07:00 – 19:00) and Evening and Nighttime Period (19:00 - 07:00) of Operation – *Before Noise Barrier*

Point of Reception ID	POR Description	Location	Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit Daytime Period (dBA)	Estimated Sound Level at POR Evening and Nighttime Period (Worst Case) (dBA)	Performance Limit Evening and Nighttime Period (dBA)	Compliance with Performance Limit (Yes/No)	Verified by an acoustic Audit (Yes / No)
POR 1	Residence	POW	41.3	45	34.4	40	Yes	No
		OPR	41.2	45	34.1	40	Yes	No
POR 2	Residence	POW	42.2	45	35.5	40	Yes	No
		OPR	40.1	45	33.2	40	Yes	No
POR 3	Residence	POW	34.8	50	27.0	45	Yes	No
		OPR	33.4	50	26.4	45	Yes	No
POR 4	Residence	POW	43.0	50	36.3	45	Yes	No
		OPR	42.6	50	35.8	45	Yes	No
POR 5	Vacant Lot	POW	44.1	50	37.2	45	Yes	No
		OPR	41.6	50	34.1	45	Yes	No
POR 6	Residence	POW	43.4	50	37.0	45	Yes	No
		OPR	43.1	50	36.7	45	Yes	No
POR 7	Residence	POW	45.0	50	38.9	45	Yes	No
		OPR	44.8	50	38.6	45	Yes	No
POR 8	Residence	POW	49.5	50	43.4	45	Yes	No
		OPR	47.6	50	41.7	45	Yes	No
POR 9	Residence	POW	44.7	50	38.8	45	Yes	No
		OPR	45.1	50	39.3	45	Yes	No
POR 10	Residence	POW	44.3	50	37.8	45	Yes	No
		OPR	43.5	50	36.8	45	Yes	No

Notes:

1. Performance limits are based on 1-hour equivalent sound levels, Leq.

2. The highest predicted sound level at plane of window or Outdoor Point of Reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.7.1 and A2.7.2 in Appendix 2 for more detailed sound level estimates by source.

3. As per NPC-300 Outdoor points of reception (OPR) are not considered noise sensitive during the nighttime period.

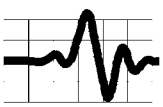


Table 6.2: Acoustic Assessment Summary Table, Worst Case, Daytime Period (07:00 – 19:00) and Evening and Nighttime Period (19:00 - 07:00) of Operation – *After Noise Barrier*

Point of Reception ID	POR Description	Location	Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit Daytime Period (dBA)	Estimated Sound Level at POR Evening and Nighttime Period (Worst Case) (dBA)	Performance Limit Evening and Nighttime Period (dBA)	Compliance with Performance Limit (Yes/No)	Verified by an acoustic Audit (Yes / No)
POR 1	Residence	POW	41.9	45	35.5	40	Yes	No
		OPR	41.7	45	35.2	40	Yes	No
POR 2	Residence	POW	42.8	45	36.6	40	Yes	No
		OPR	40.7	45	34.2	40	Yes	No
POR 3	Residence	POW	35.3	50	28.1	45	Yes	No
		OPR	33.9	50	27.4	45	Yes	No
POR 4	Residence	POW	43.6	50	37.5	45	Yes	No
		OPR	43.3	50	36.9	45	Yes	No
POR 5	Vacant Lot	POW	44.2	50	37.5	45	Yes	No
		OPR	41.7	50	34.5	45	Yes	No
POR 6	Residence	POW	43.7	50	37.5	45	Yes	No
		OPR	43.5	50	37.2	45	Yes	No
POR 7	Residence	POW	45.6	50	39.6	45	Yes	No
		OPR	45.4	50	39.4	45	Yes	No
POR 8	Residence	POW	50.0	50	44.3	45	Yes	No
		OPR	48.4	50	42.7	45	Yes	No
POR 9	Residence	POW	45.4	50	39.7	45	Yes	No
		OPR	45.9	50	40.3	45	Yes	No
POR 10	Residence	POW	45.0	50	39.0	45	Yes	No
		OPR	43.6	50	37.2	45	Yes	No

Notes:

4. Performance limits are based on 1-hour equivalent sound levels, Leq.

5. The highest predicted sound level at plane of window or Outdoor Point of Reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.7.3 and A2.7.4 in Appendix 2 for more detailed sound level estimates by source.

6. As per NPC-300 Outdoor points of reception (OPR) are not considered noise sensitive during the nighttime period.

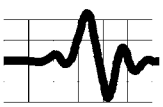


Table 7: Recommended Noise Barrier

Barrier	Minimum Height at Top of Barrier (m)	Minimum Length at Top of Barrier (m)	Maximum Distance from Source (m)	Location*	Required to shield Line of Sight from Identified Source ID	Required to shield Line of Sight to Identified Receptor/s	Description
Barrier_1	3.6	40	Not applicable	Northern boundary of proposed fenced area in location shown on Figure 8	• Loader • Concrete_Truck_Slump_ Mix	• POR 8	New barrier (berm): Required prior to increasing capacity greater than ten loads of concrete per hour. Not required when operating at a capacity of ten loads of concrete per hour or less.

*Refer to Figure 8 for location of noise barrier.

FIGURES

Figure 1: Scaled Area Location Plan showing Receptor Locations

Figure 2: Site Plan & Surface Elevation Contours (elevation contours at 1-meter intervals)

Figure 3: Detail Plan at PBC Plant showing Source Locations

Figure 4: Scenario 1 - Prediction Results, Worst Case, PBC Plant operating at maximum capacity of 10 loads of concrete per hour with all equipment in operation – Before Noise Barriers; Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m)

Figure 5: Scenario 2- Prediction Results, Worst Case, PBC Plant in operation with limited production at maximum capacity of 3 loads of concrete per hour (Evening and Nighttime Period): Noise Contours, (Noise levels at 4.5 m)

Figure 6: Scenario 3 - Prediction Results, Worst Case, PBC Plant operating at maximum capacity of 14 loads of concrete per hour with all equipment in operation – Before Noise Barriers; Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m)

Figure 7: Scenario 4- Prediction Results, Worst Case, PBC Plant in operation with limited production at maximum capacity of 4 loads of concrete per hour (Evening and Nighttime Period): Noise Contours, (Noise levels at 4.5 m)

Figure 8: Detail Plan at PBC Plant showing Recommended Noise Barrier

Figure 1: Scaled Area Location Plan showing Receptor Locations

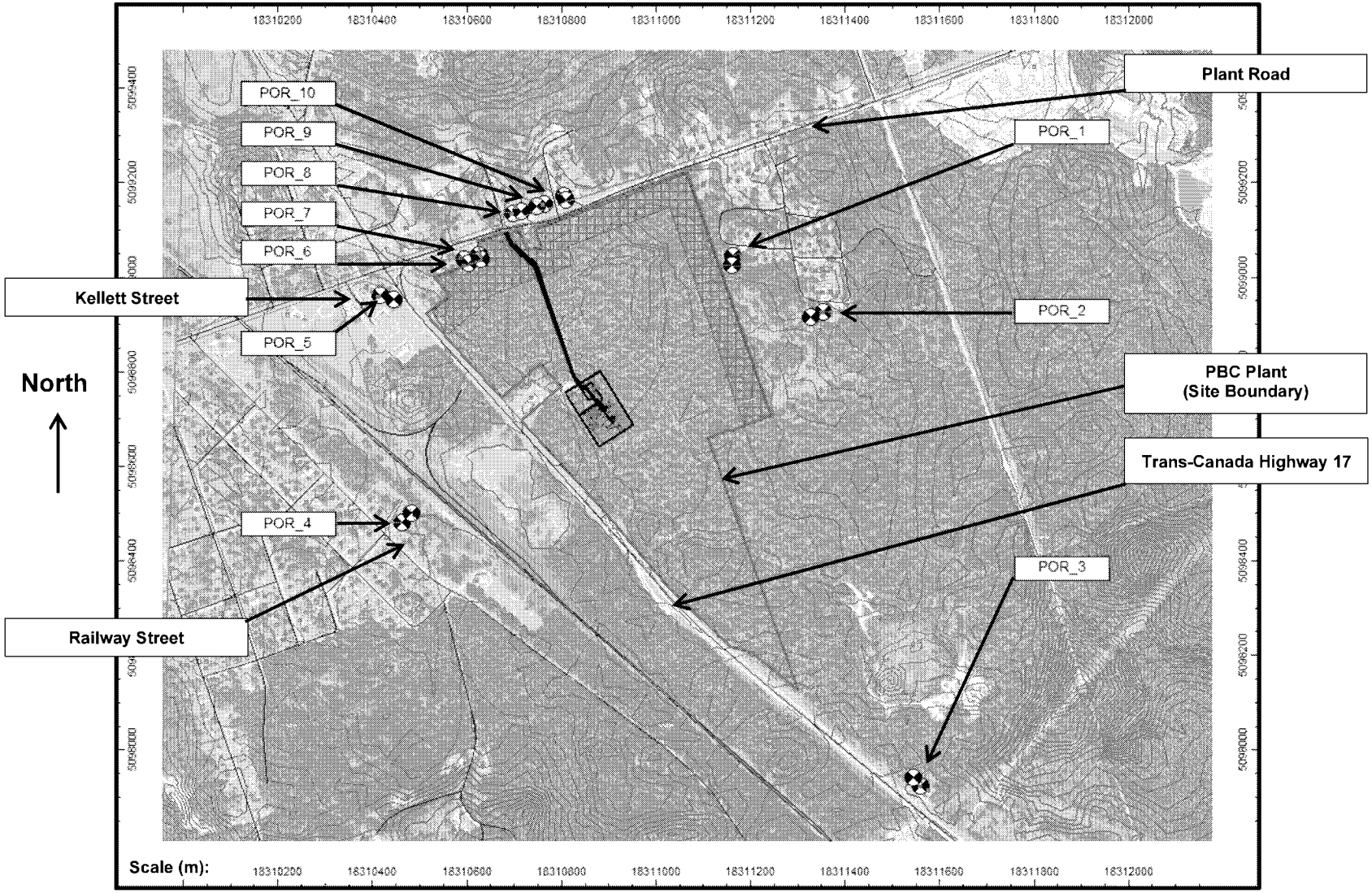


Figure 2: Site Layout & Surface Elevation Contours (elevation contours at 1-meter intervals)

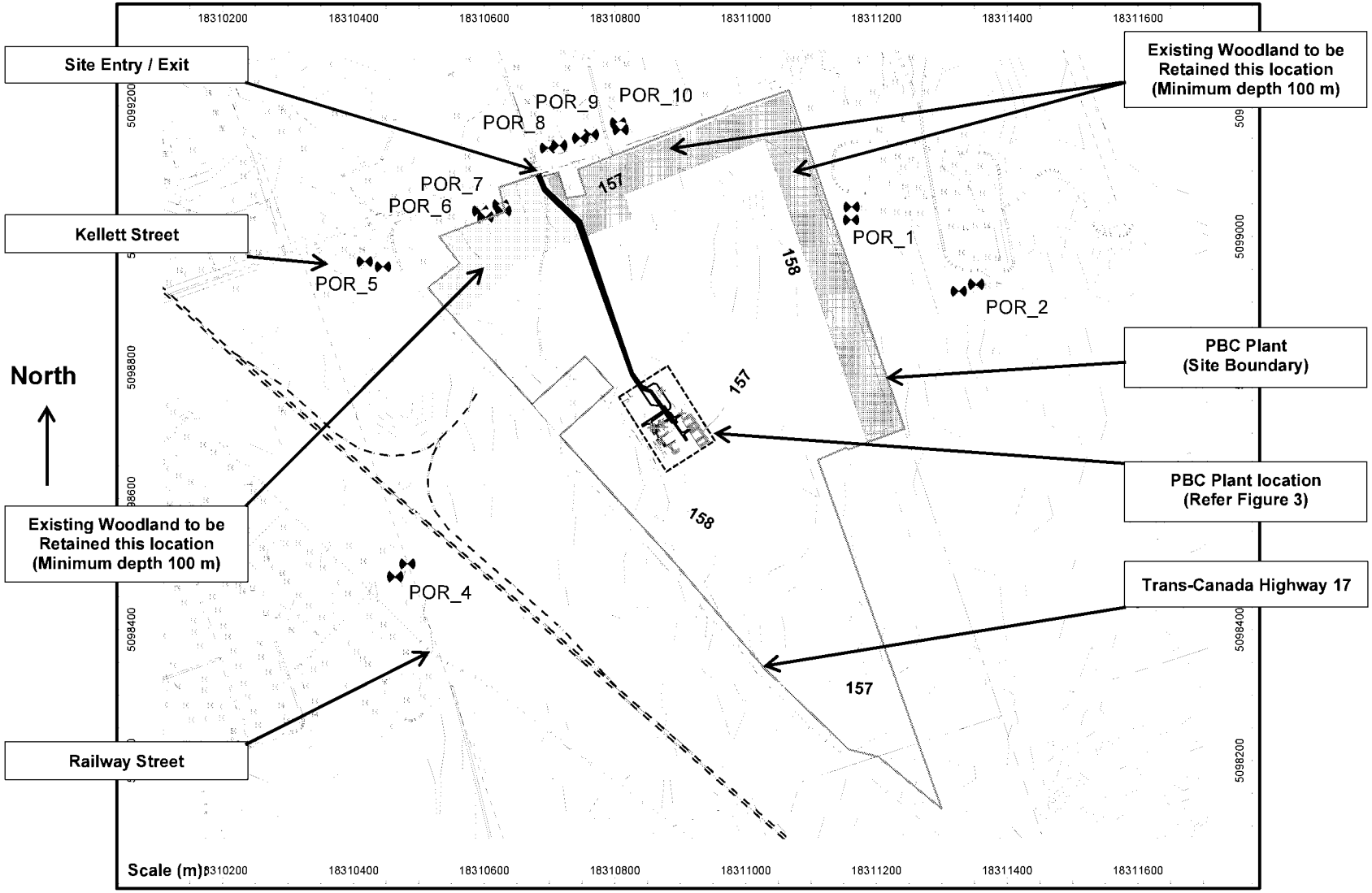


Figure 3: Detail Plan at PBC Plant showing Source Locations

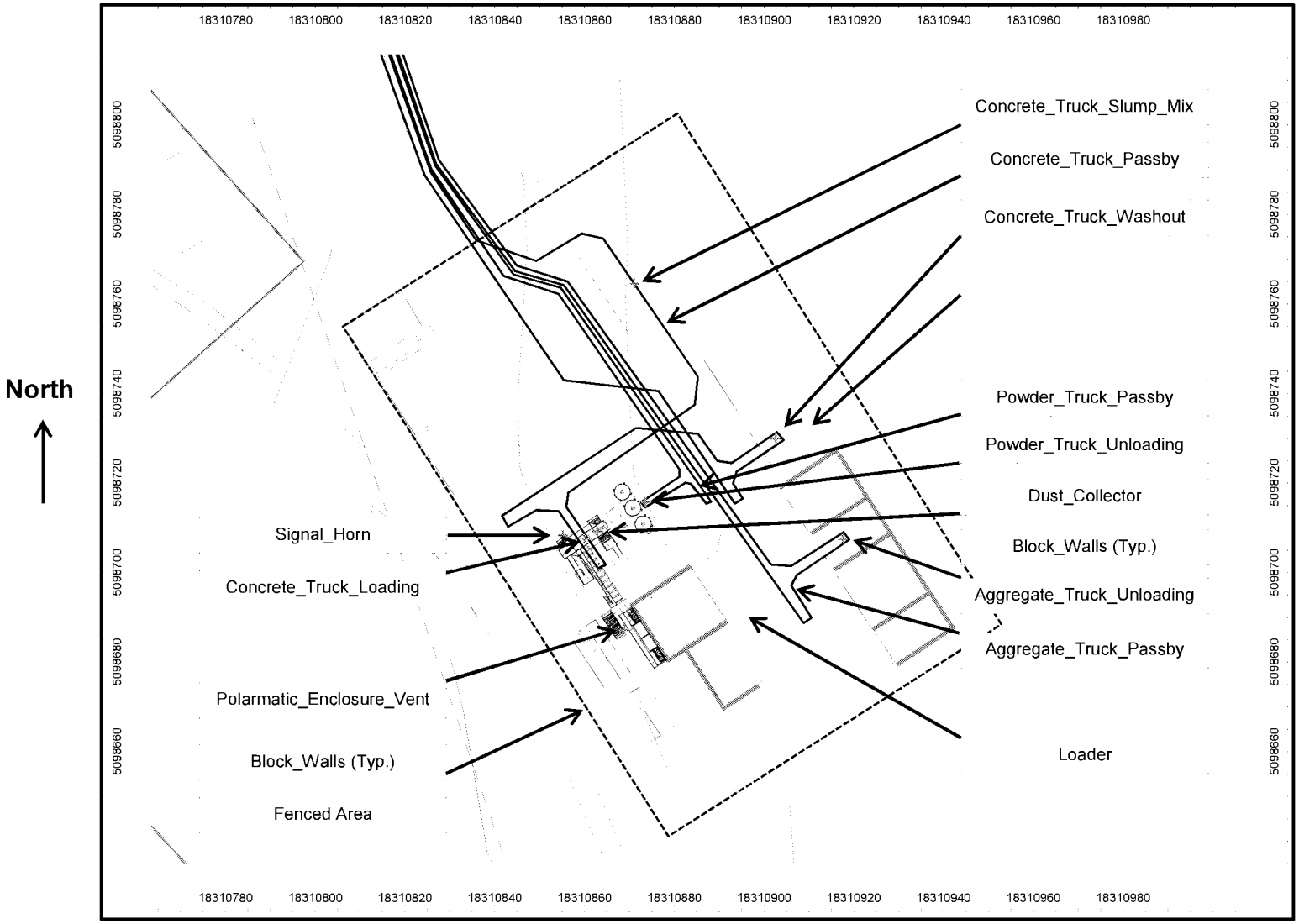


Figure 4: Scenario 1 - Prediction Results, Worst Case, PBC Plant operating at maximum capacity with all equipment in operation; Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m)

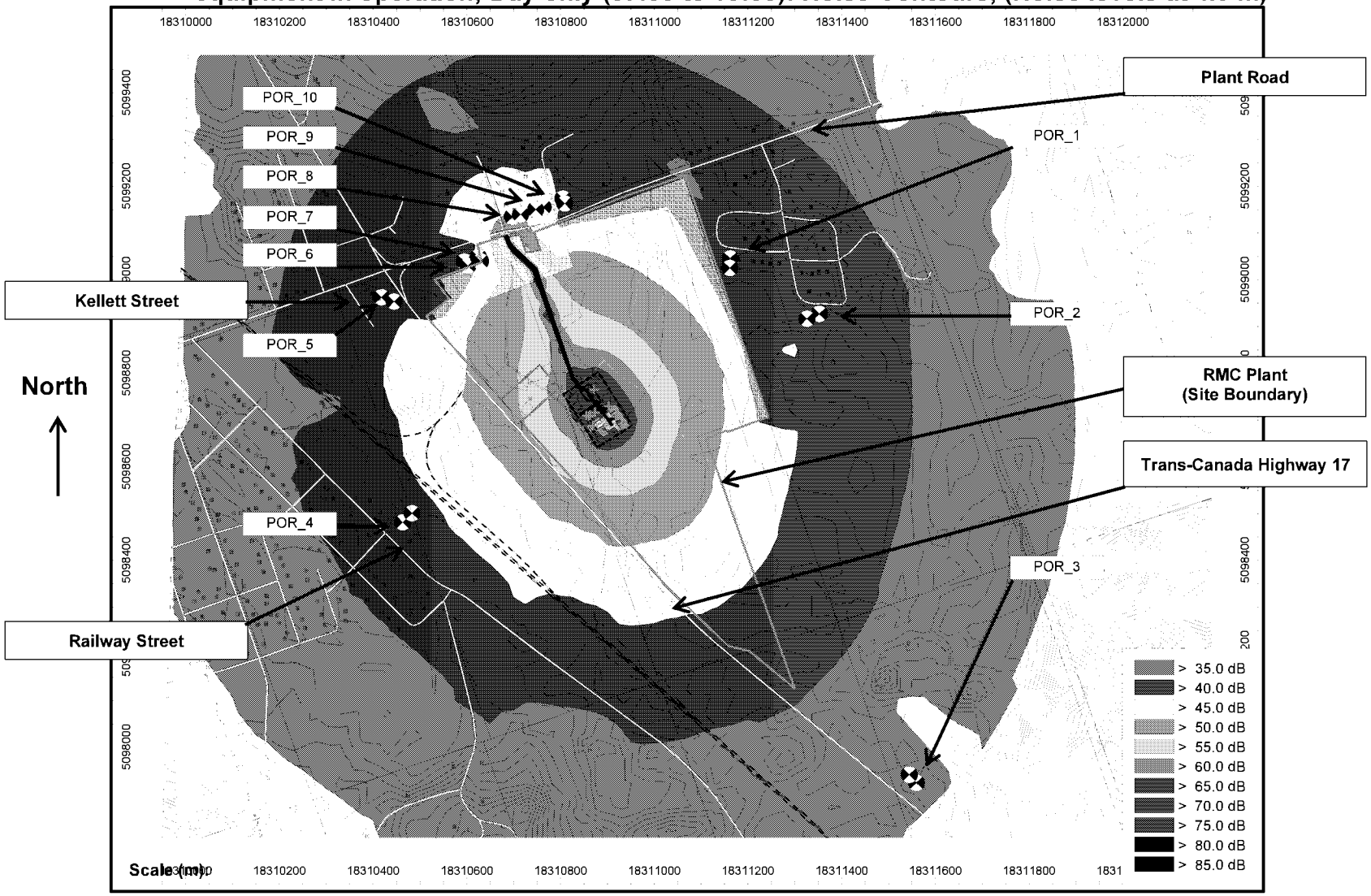


Figure 5: Scenario 2 - Prediction Results, Worst Case, PBC Plant in operation with limited production (Evening and Nighttime Period): Noise Contours, (Noise levels at 4.5 m)

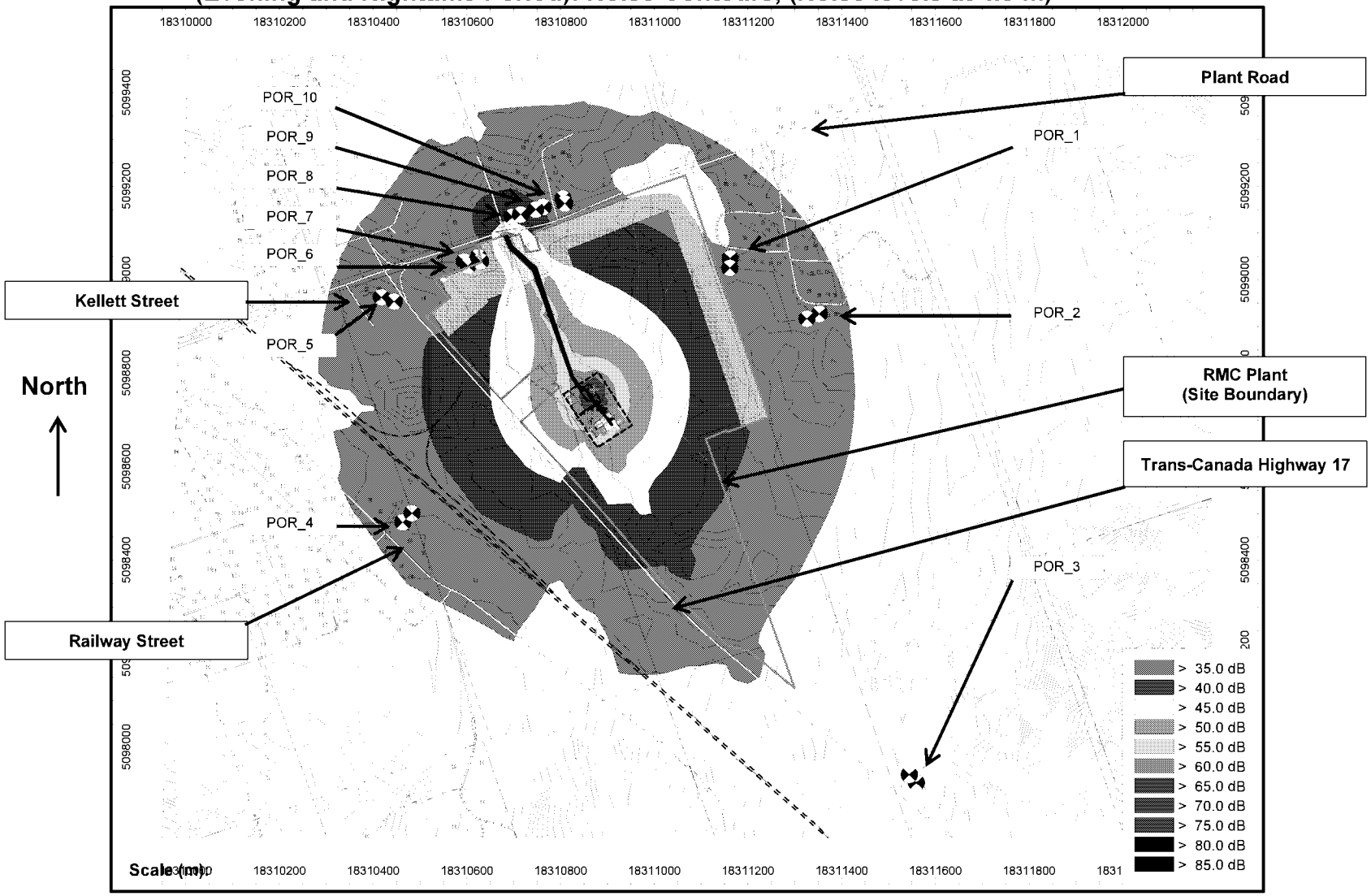


Figure 6: Scenario 3 - Prediction Results, Worst Case, PBC Plant operating at maximum capacity with all equipment in operation; Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m)

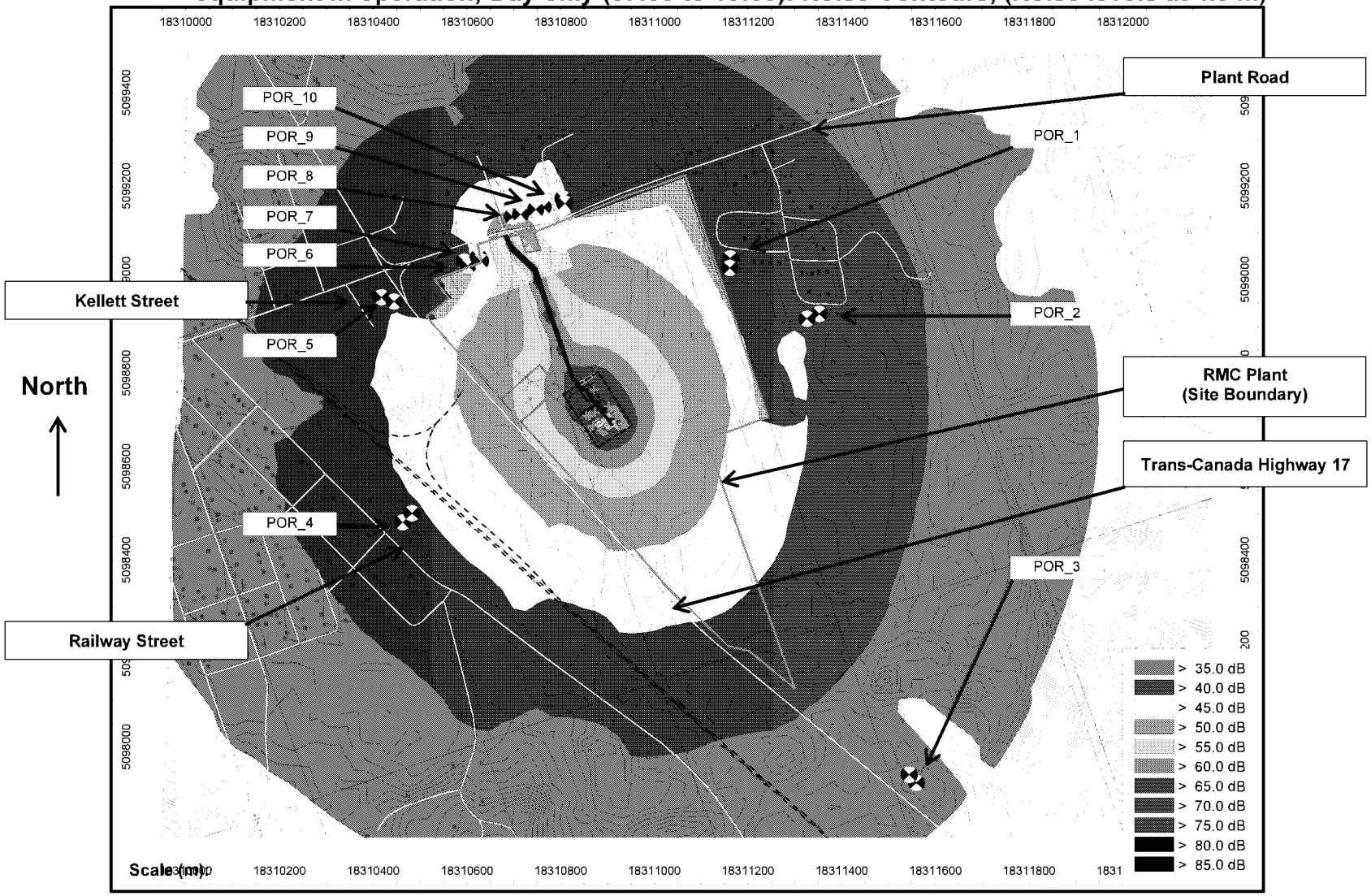


Figure 7: Scenario 4 - Prediction Results, Worst Case, PBC Plant in operation with limited production (Evening and Nighttime Period): Noise Contours, (Noise levels at 4.5 m)

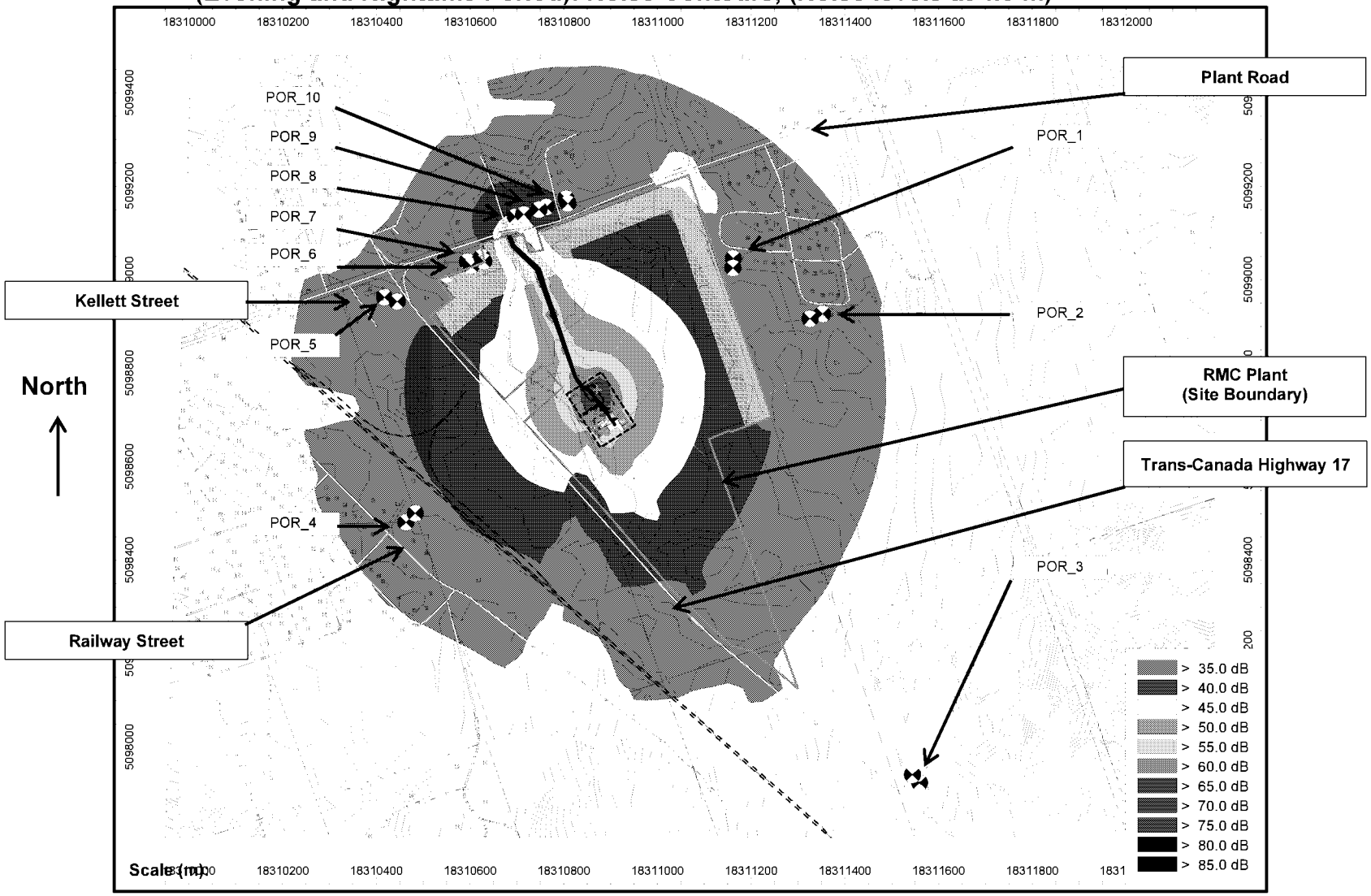
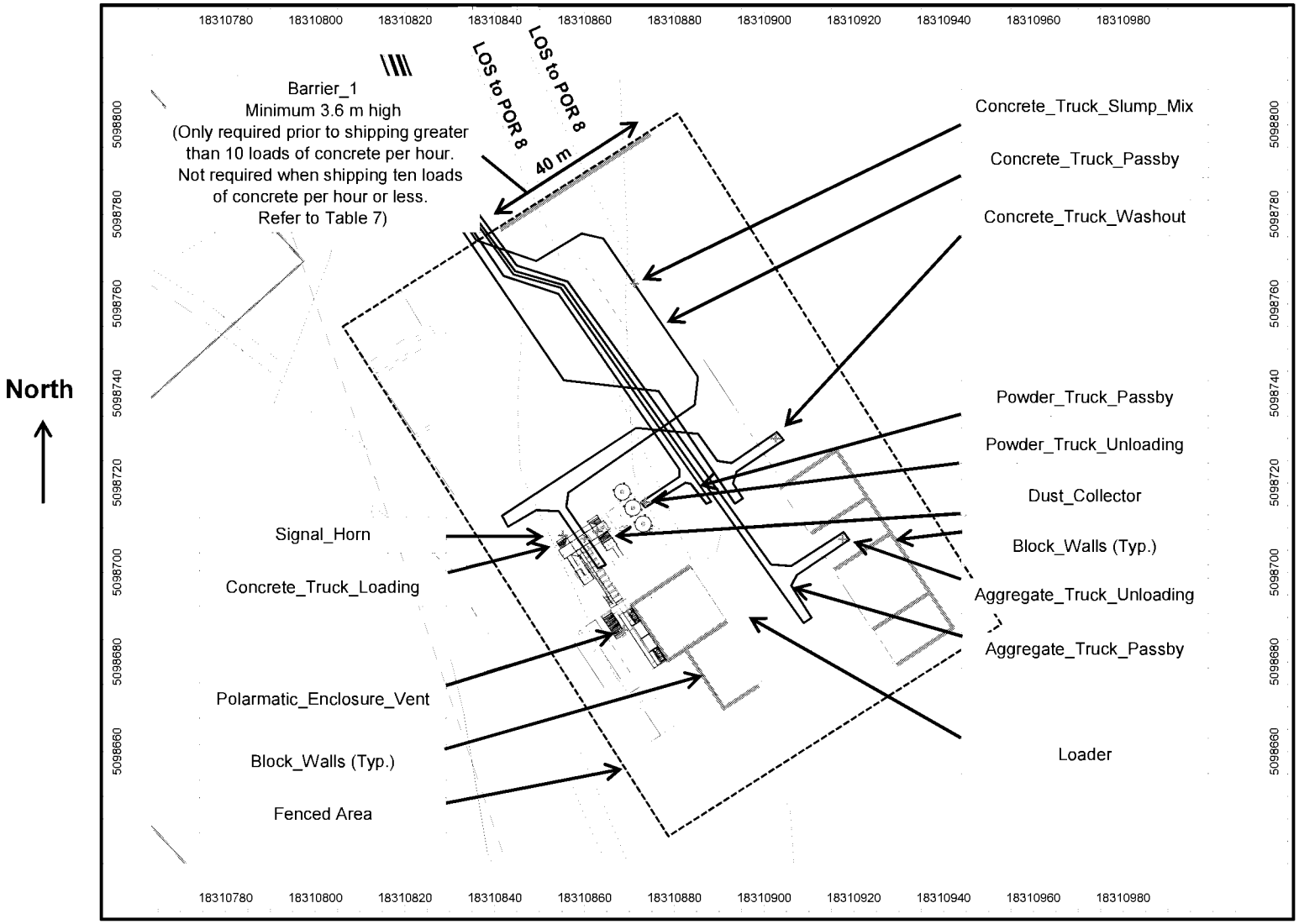


Figure 8: Detail Plan at PBC Plant showing Recommended Noise Barriers



Appendix 1

Zoning Plan and Land Use Designations

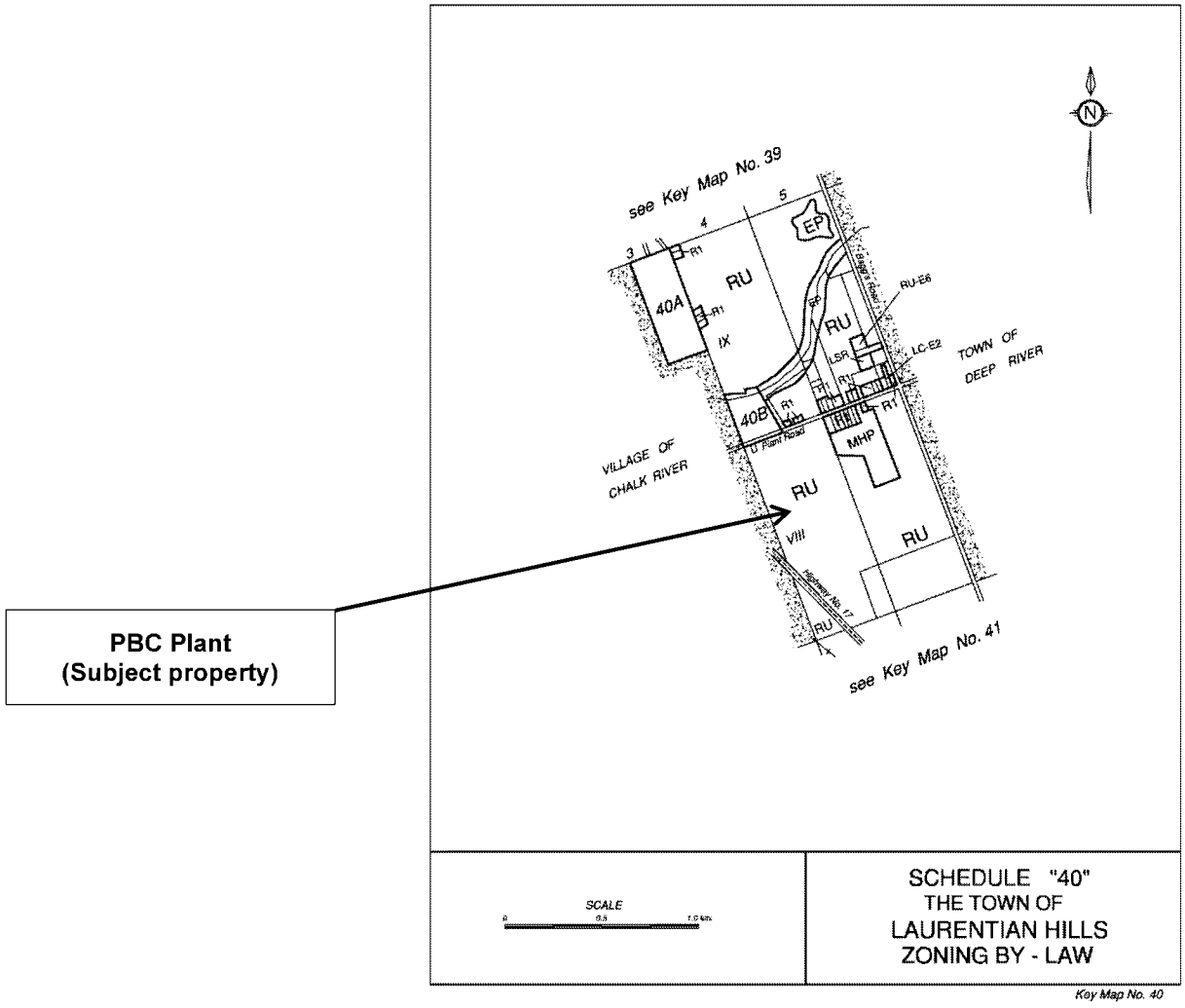
Contents:

Legend:

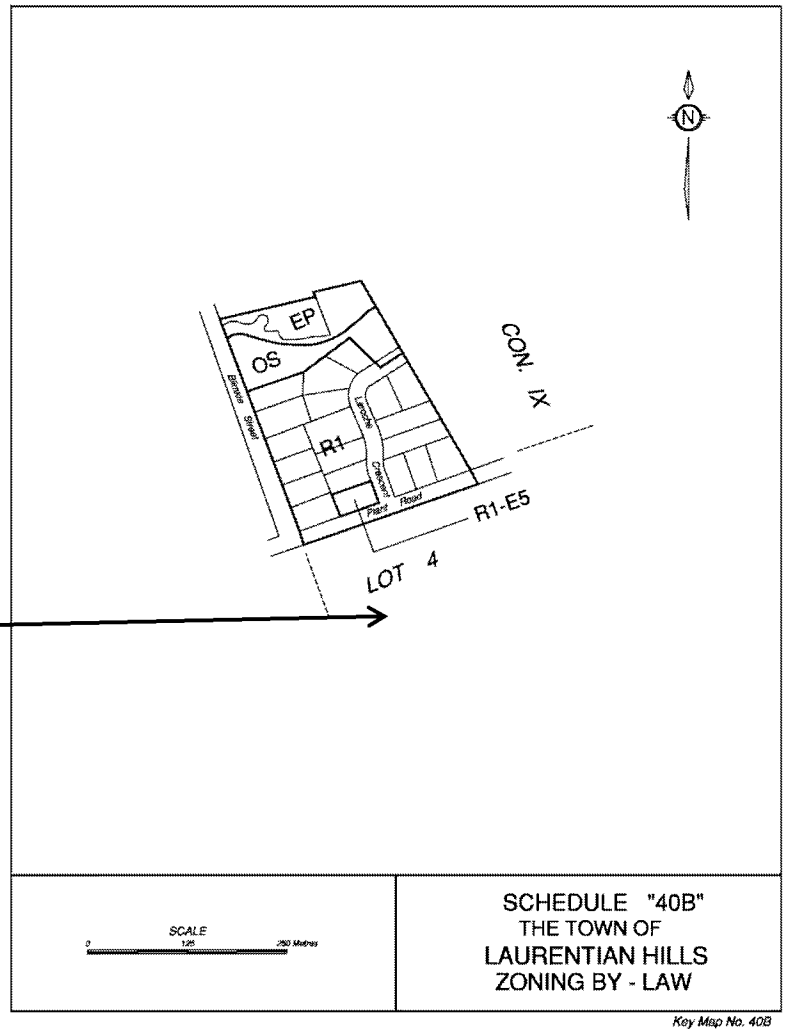
Residential One Zone - R1
Residential Two Zone - R2
Mobile Home Park Residential Zone - MHP
Limited Service Residential Zone - LSR
General Commercial Zone - GC
Highway Commercial Zone - HC
Limited Commercial Zone - LC
Recreational Commercial Zone - RC
Neighbourhood Commercial Zone - NC
General Industrial Zone - GM
Mineral Aggregate Resource Zone -
- Mineral Aggregate Resources Pit (EMP)
- Mineral Aggregate Resources Quarry (EMQ)
- Mineral Aggregate Resources Reserve (EMR)

Waste Disposal Zone - DMW
Salvage Yard Zone - DMS
Community Facility Zone - CF
Open Space Zone - OS
Rural Zone - RU
Environmental Protection Zone - EP
Heritage Zone – H

Zoning Map: **The Town of Laurentian Hills Zoning By-Lay, Schedule 40**



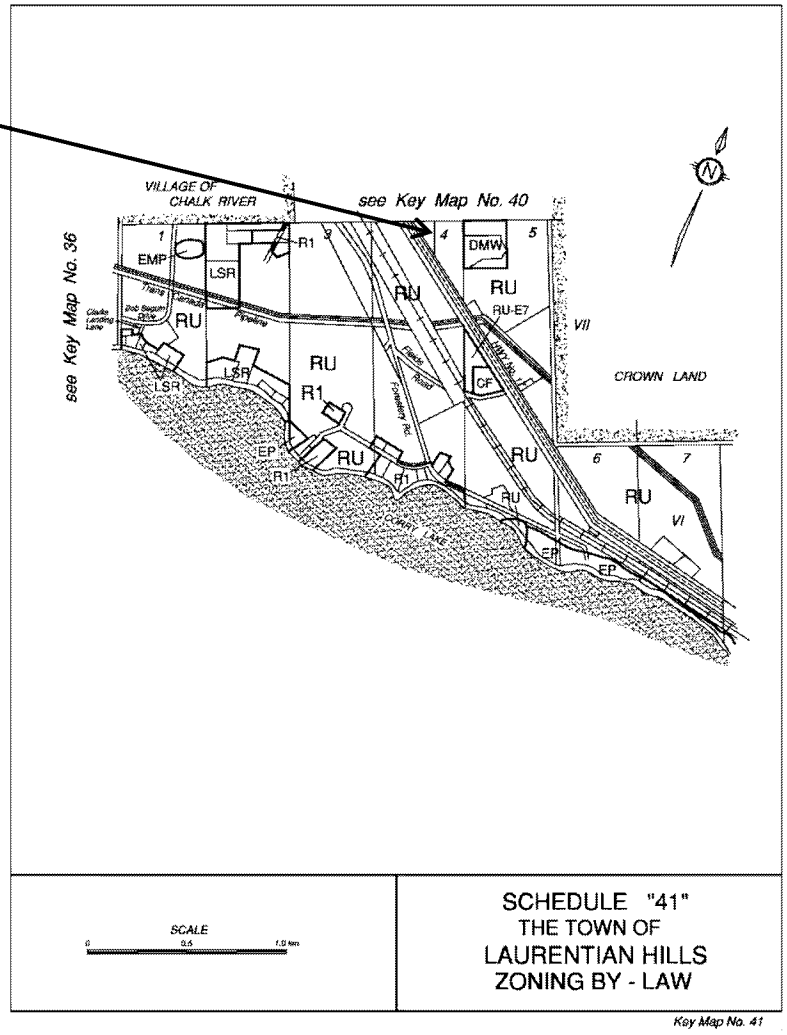
Zoning Map: **The Town of Laurentian Hills Zoning By-Lay, Schedule 40B**



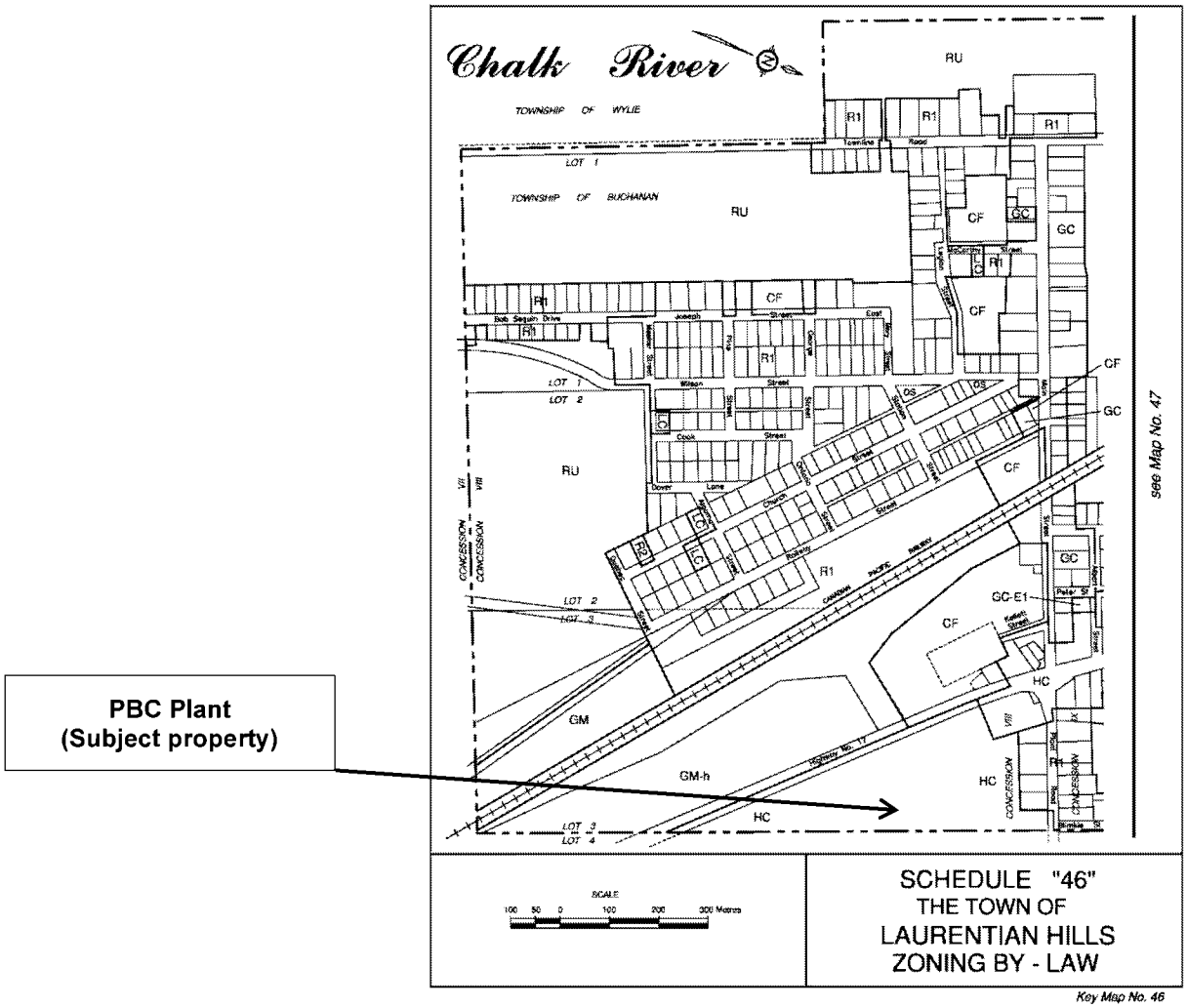
PBC Plant
(Subject property)

Zoning Map: The Town of Laurentian Hills Zoning By-Lay, Schedule 41

PBC Plant
(Subject property)

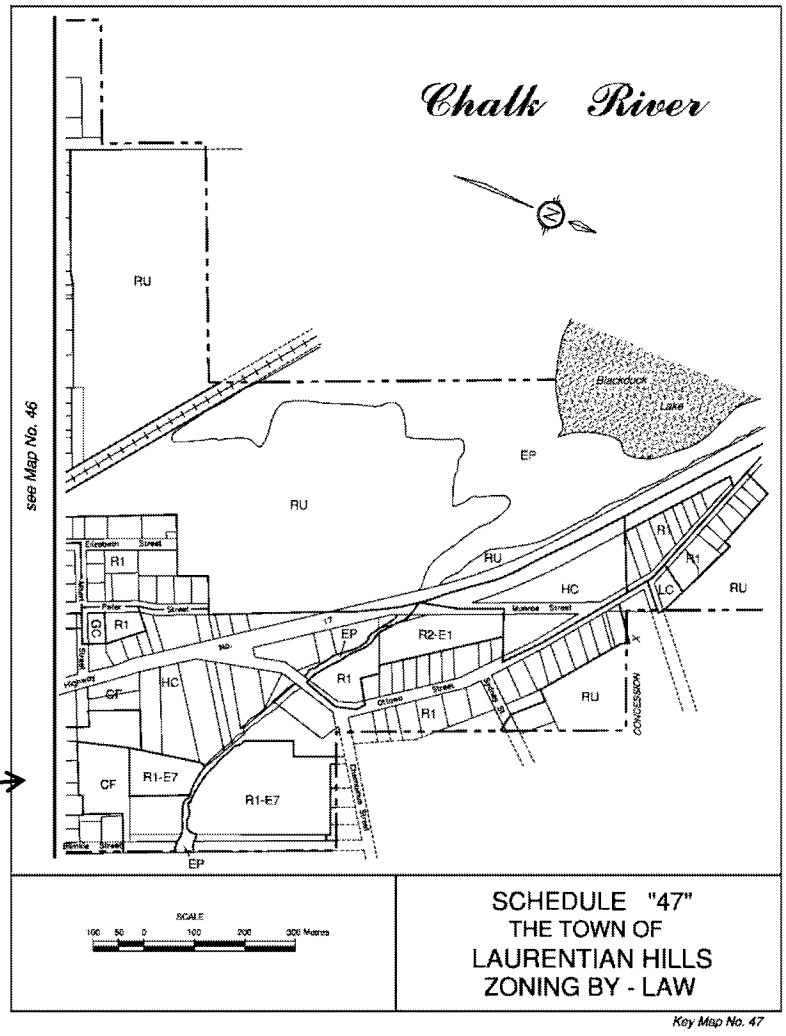


Zoning Map: **The Town of Laurentian Hills Zoning By-Lay, Schedule 46**



Zoning Map: **The Town of Laurentian Hills Zoning By-Lay, Schedule 47**

PBC Plant
(Subject property –
Approximate Location)



Appendix 2

Acoustic Modelling Details

Modeling Notes:

1. Acoustic model developed uses Cadna-A software, Version 2022.
2. Sound propagation is modeled according to ISO 9613-2: 1996(E).
3. The whole of the disturbed (Fenced) area of the site is modeled as relatively reflective with an absorption coefficient of 0.3. The surrounding area is modelled with an absorption coefficient of 1.0 indicative of a Class 3 Area.
4. MECP favoured conservative modelling assumptions are used, that is, 'no subtraction of negative ground attenuation' and 'no negative path differences'.

Contents:

Table A2.1 Point of Reception Location Table

Name	ID	Height	Coordinates		
			X	Y	Z
		(m)	(m)	(m)	(m)
POR_1_POW	POR_1_POW	2.0	18311162.0	5099045.2	160.0
POR_1_OPR	POR_1_OPR	1.5	18311161.4	5099025.1	159.5
POR_2_POW	POR_2_POW	2.0	18311352.7	5098927.1	160.3
POR_2_OPR	POR_2_OPR	1.5	18311326.1	5098916.6	159.5
POR_3_POW	POR_3_POW	2.0	18311559.9	5097924.3	159.0
POR_3_OPR	POR_3_OPR	1.5	18311544.5	5097941.5	158.5
POR_4_POW	POR_4_POW	3.0	18310463.5	5098481.0	162.3
POR_4_OPR	POR_4_OPR	1.5	18310483.2	5098500.5	160.7
POR_5_POW	POR_5_POW	4.5	18310417.6	5098962.3	164.7
POR_5_OPR	POR_5_OPR	1.5	18310445.2	5098953.4	161.3
POR_6_POW	POR_6_POW	2.0	18310594.3	5099038.9	159.0
POR_6_OPR	POR_6_OPR	1.5	18310602.4	5099029.6	158.5
POR_7_POW	POR_7_POW	2.0	18310625.1	5099048.3	159.0
POR_7_OPR	POR_7_OPR	1.5	18310629.5	5099039.3	158.5
POR_8_POW	POR_8_POW	3.0	18310697.6	5099134.9	161.6
POR_8_OPR	POR_8_OPR	1.5	18310714.8	5099139.2	159.7
POR_9_POW	POR_9_POW	2.0	18310763.1	5099155.6	159.5
POR_9_OPR	POR_9_OPR	1.5	18310747.1	5099150.0	159.0
POR_10_POW	POR_10_POW	3.0	18310805.1	5099173.4	160.1
POR_10_OPR	POR_10_OPR	1.5	18310809.0	5099163.1	158.6

Table A2.2 Point Sources

Name	Result. PWL			Lw / Li Type	Noise Source	Operating Time			Direct.	Source
	Day	Evening	Night		Library File	Day	Evening	Night		Height
	(dBA)	(dBA)	(dBA)			(min/Hr)	(min/Hr)	(min/Hr)		(m)
Concrete_Truck_Loading_S1_2	111	111	111	Lw	Concrete_Truck_Loading_P1	50.0	15.0	15.0	(none)	4.0
Concrete_Truck_Slump_Mix_S1_2	108	108	108	Lw	Concrete_Truck_Slump_Mix	50.0	15.0	15.0	(none)	4.0
Concrete_Truck_Washout_S1_2	96	96	96	Lw	Concrete_Truck_Washout	50.0	15.0	15.0	(none)	4.0
Signal_Horn_S1_2	117	117	117	Lw	Signal_Horn	0.8	0.3	0.3	(none)	5.0
Polarmatic_Enclosure_Vent	101	101	101	Lw	Compressor	60.0	60.0	60.0	(none)	1.8
Dust_Collector	98	98	98	Lw	Dust_Extractor	30	30	30	(none)	9.5
Powder_Truck_Unloading	102	102	102	Lw	Powder_Truck_Unload	60.0	0.0	0.0	(none)	0.8
Aggregate_Truck_Unloading	108	108	108	Lw	Aggregate_Truck_Unloading	20.0	0.0	0.0	(none)	2.5
Concrete_Truck_Loading_S3_4	111	111	111	Lw	Concrete_Truck_Loading_P1	60.0	20.0	20.0	(none)	4.0
Concrete_Truck_Slump_Mix_S3_4	108	108	108	Lw	Concrete_Truck_Slump_Mix	60.0	20.0	20.0	(none)	4.0
Concrete_Truck_Washout_S3_4	96	96	96	Lw	Concrete_Truck_Washout	60.0	20.0	20.0	(none)	4.0
Signal_Horn_S3_4	117	117	117	Lw	Signal_Horn	1.0	0.3	0.3	(none)	5.0

Table A2.3 Line Sources

Name	Result. PWL			Lw / Li Type	Noise Source	Moving Point Source			Direct.	Speed
	Day	Evening	Night		Library File	Day	Evening	Night		
	(dBA)	(dBA)	(dBA)			(Number)	(Number)	(Number)		(km/h)
Concrete_Truck_Passby_S1	104	98.9	98.9	PWL-Pt	Concrete_Truck_Passby	10.0	3.0	3.0	(none)	20.0
Powder_Truck_Passby	88	-	-	PWL-Pt	Powder_Truck_Passby	1.0	0.0	0.0	(none)	20.0
Aggregate_Truck_Passby_S1	80	-	-	PWL-Pt	Aggregate_Truck_Passby	4.0	0.0	0.0	(none)	20.0
Concrete_Truck_Passby_S2	106	100.1	100.1	PWL-Pt	Concrete_Truck_Passby	14.0	4.0	4.0	(none)	20.0
Aggregate_Truck_Passby_S2	77	-	-	PWL-Pt	Aggregate_Truck_Passby	2.0	0.0	0.0	(none)	20.0

Table A2.4 Area Sources

Name	Result. PWL			Lw / Li Type	Noise Source	Operating Time / Moving Point Source			Direct.	Speed
	Day	Evening	Night		Library File	Day	Evening	Night		
	(dBA)	(dBA)	(dBA)			(min / Number)	(min / Number)	(min / Number)		(km/h)
Loader	109.4	109.4	109.4	PWL-Pt	Loader_JD544K	60 / 1	60 / 1	60 / 1	(none)	20

Table A2.5 Noise Source Library

ID	Type	Spectra (dB)											Source*
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Concrete_Truck_Loading_P1	Lw	101.8	115.1	107.7	102.8	107.2	107.8	104.9	95.7	89.4	111.3	117.5	Meas. on-site at Brant 03/12/21 - 73.1 at 28.5m
Concrete_Truck_Slump_Mix	Lw	98.0	106.5	102.6	104.7	102.4	103.1	101.0	96.4	91.0	107.5	111.9	Meas. on-site at Brant 03/12/21 - 74.8 at 15m
Concrete_Truck_Washout	Lw	96.0	102.5	94.2	91.1	90.2	93.4	88.0	82.5	79.6	96.1	104.7	Meas. Hanson RMC Pembroke 10 Oct 2019 at 8.5 m
Signal_Horn	Lw	118.9	112.8	103.3	110.3	113.0	113.5	107.9	104.6	99.0	116.6	122.1	Meas. on-site at Ayr 02/12/21 - 80.4 at 22m
Compressor	Lw	88.1	86.9	89.9	95.7	100.2	95.1	93.3	84.4	74.2	100.8	103.4	Meas. Moodie HMA Plant June 2021 at 3.5 m
Dust_Extractor	Lw	89.5	97.9	111.9	97.6	92.2	88.0	82.5	77.6	65.8	98.0	112.3	Meas. Hanson RMC Sheffield 23 April 2020 at 0.6 m
Powder_Truck_Unload	Lw	93.8	100.2	98.3	97.1	97.1	97.9	95.7	92.2	84.2	102.2	106.2	Meas. Hanson RMC Sheffield 23 April 2020 at 2.7 m
Aggregate_Truck_Unloading	Lw	108.0	108.8	104.2	105.1	105.6	104.0	99.4	95.1	90.0	108.1	114.3	Meas. on-site at Ayr 02/12/21 - 71.7 at 23 m
Loader_JD544K_Beeper	Lw	99.3	110.2	114.6	100.4	95.6	101.8	106.4	93.9	83.3	109.4	116.8	Meas. on-site at Brant 03/12/21 - 77.8 at 13.5 m
Loader_JD544K_No_Beeper	Lw	100.7	114.5	113.8	99.6	96.3	98.3	100.2	91.5	80.0	105.1	117.5	Meas. on-site at Brant 03/12/21 - 72.6 at 15 m
Concrete_Truck_Passby	Lw	95.6	107.1	98.0	102.8	101.2	102.9	100.6	95.1	88.2	106.9	111.1	Meas. on-site at Brant 03/12/21 - 75.3 at 13.5 m
Aggregate_Truck_Passby	Lw	94.7	96.7	88.4	85.1	84.7	82.4	77.1	69.8	63.5	86.7	99.6	Meas. Hanson RMC Sheffield 23 April 2020 at 12
Powder_Truck_Passby	Lw	102.8	104.4	103.0	98.0	97.7	97.8	94.4	88.5	80.7	101.7	109.5	Meas. Hanson RMC Pembroke 10 Oct 2019 at 14 m

Table A2.6 Raw Measurement Data

ID	Type	Spectra (dB)											Source*
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Meas_Concrete_Truck_Loading_P1	Li	63.6	76.9	69.5	64.6	69.0	69.6	66.7	57.5	51.2	73.1	79.3	Meas. on-site at Brant 03/12/21 - 73.1 at 28.5m
Meas_Concrete_Truck_Slump_Mix	Li	65.3	73.8	69.9	72.0	69.7	70.4	68.3	63.7	58.3	74.8	79.2	Meas. on-site at Brant 03/12/21 - 74.8 at 15m
Meas_Concrete_Truck_Washout	Li	69.4	75.9	67.6	64.5	63.6	66.8	61.4	55.9	53.0	69.5	78.1	Meas. Hanson PBC Plant on 10 Oct 2019 at 8.5 m
Meas_Signal_Horn	Li	83.3	77.2	67.7	74.7	77.4	77.9	72.3	69.0	63.4	81.0	86.5	Meas. on-site at Ayr 02/12/21 - 80.4 at 22m
Meas_Compressor	Li	69.2	68.0	71.0	76.8	81.3	76.2	74.4	65.5	55.3	81.9	84.5	Meas. Moodie HMA Plant June 2021 at 3.5 m
Meas_Dust_Extractor	Li	85.9	94.3	108.3	94.0	88.6	84.4	78.9	74.0	62.2	94.4	108.7	Meas. Hanson RMC Sheffield 23 April 2020 at 0.6 m
Meas_Powder_Truck_Unload	Li	77.2	83.6	81.7	80.5	80.5	81.3	79.1	75.6	67.6	85.6	89.6	Meas. Hanson RMC Sheffield 23 April 2020 at 2.7 m
Meas_Aggregate_Truck_Unloading	Li	71.6	72.4	67.8	68.7	69.2	67.6	63.0	58.7	53.6	71.7	77.9	Meas. on-site at Ayr 02/12/21 - 71.7 at 23 m
Meas_Loader_JD544K_Beeper	Li	67.7	78.6	83.0	68.8	64.0	70.2	74.8	62.3	51.7	77.8	85.2	Meas. on-site at Brant 03/12/21 - 77.8 at 13.5 m
Meas_Loader_JD544K_No_Beeper	Li	68.2	82.0	81.3	67.1	63.8	65.8	67.7	59.0	47.5	72.6	85.0	Meas. on-site at Brant 03/12/21 - 72.6 at 15 m
Meas_Concrete_Truck_Passby	Li	64.0	75.5	66.4	71.2	69.6	71.3	69.0	63.5	56.6	75.3	79.5	Meas. on-site at Brant 03/12/21 - 75.3 at 13.5 m
Meas_Aggregate_Truck_Passby	Li	65.1	67.1	58.8	55.5	55.1	52.8	47.5	40.2	33.9	57.1	70.0	Meas. Hanson RMC Sheffield 23 April 2020 at 12
Meas_Powder_Truck_Passby	Li	71.8	73.4	72.0	67.0	66.7	66.8	63.4	57.5	49.7	70.7	78.5	Meas. Hanson RMC Pembroke 10 Oct 2019 at 14 m

Table A2.7.1 Point of Reception Impacts by Source for Scenario 1*

	POR 1 W	POR 1 OPR	POR 2 W	POR 2 OPR	POR 3 W	POR 3 OPR	POR 4 W	POR 4 OPR	POR 5 W	POR 5 OPR	POR 6 W	POR 6 OPR	POR 7 W	POR 7 OPR	POR 8 W	POR 8 OPR	POR 9 W	POR 9 OPR	POR 10 W	POR 10 OPR
Sources	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Concrete_Truck_Loading_S1	22.4	22.6	23.9	22.5	16.3	16.4	25.4	26.0	24.2	23.7	21.8	21.9	22.2	22.2	24.3	22.0	20.5	20.2	22.1	21.3
Concrete_Truck_Slump_Mix_S1	36.6	36.3	38.0	34.3	29.7	29.1	39.1	38.5	39.0	35.4	35.7	35.3	36.0	35.7	39.1	36.0	34.5	33.8	37.2	36.2
Concrete_Truck_Washout_S1	25.8	25.7	26.5	24.4	19.6	19.2	23.5	20.3	27.8	25.1	24.6	24.3	24.9	24.7	28.5	25.1	23.6	23.0	26.0	25.2
Signal_Horn_S1	27.5	27.0	29.4	28.2	4.6	4.7	31.6	30.9	30.7	28.8	27.3	26.7	27.7	27.0	30.2	27.5	26.2	24.7	28.2	25.7
Polarmatic_Enclosure_Vent	13.2	12.6	11.6	9.8	9.2	9.3	17.1	16.8	21.3	20.6	11.3	11.1	12.5	12.3	12.2	9.1	7.5	7.4	11.9	11.4
Dust_Collector	25.4	25.5	25.9	26.1	18.5	18.0	23.2	23.7	24.9	24.9	25.5	25.5	25.8	25.8	28.1	26.6	25.4	24.8	26.1	25.2
Powder_Truck_Unloading	30.9	30.8	29.3	29.4	21.0	20.5	21.4	21.4	29.5	27.9	26.5	26.2	26.9	26.5	33.7	30.4	28.6	28.0	31.0	30.5
Aggregate_Truck_Unloading	29.2	29.3	28.2	28.5	23.5	22.9	31.6	31.2	31.8	29.6	27.5	27.4	27.5	27.7	31.4	28.1	26.4	26.1	28.9	28.1
Concrete_Truck_Passby_S1	33.3	32.9	34.0	32.4	25.2	24.4	35.1	34.6	37.8	33.8	40.3	40.0	42.9	42.6	47.8	46.3	43.1	43.8	40.9	39.9
Powder_Truck_Passby	17.7	17.2	17.9	15.9	9.7	5.8	19.1	18.4	20.7	18.1	25.1	24.6	27.6	27.2	32.6	31.0	27.9	28.6	25.7	24.7
Aggregate_Truck_Passby_S1	9.9	9.4	9.7	7.9	2.5	-1.2	11.1	10.3	12.7	10.3	16.5	16.0	18.9	18.4	24.0	21.9	19.1	19.7	17.2	15.9
Loader_JD544K_Beeper	34.9	35.2	36.1	34.1	30.7	27.7	36.5	36.9	38.4	37.2	36.4	36.5	36.9	37.1	40.5	37.4	35.1	34.8	37.1	37.1
Total	41.3	41.2	42.2	40.1	34.8	33.4	43.0	42.6	44.1	41.6	43.4	43.1	45.0	44.8	49.5	47.6	44.7	45.1	44.3	43.5

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.7.2 Point of Reception Impacts by Source for Scenario 2*

	POR 1 W	POR 1 OPR	POR 2 W	POR 2 OPR	POR 3 W	POR 3 OPR	POR 4 W	POR 4 OPR	POR 5 W	POR 5 OPR	POR 6 W	POR 6 OPR	POR 7 W	POR 7 OPR	POR 8 W	POR 8 OPR	POR 9 W	POR 9 OPR	POR 10 W	POR 10 OPR
Sources	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Concrete_Truck_Loading_S1	17.2	17.4	18.7	17.3	11.1	11.2	20.2	20.7	18.9	18.5	16.6	16.7	16.9	17.0	19.1	16.8	15.3	15.0	16.9	16.1
Concrete_Truck_Slump_Mix_S1	31.4	31.1	32.8	29.1	24.5	23.9	33.8	33.2	33.8	30.2	30.5	30.0	30.8	30.5	33.9	30.8	29.3	28.5	32.0	31.0
Concrete_Truck_Washout_S1	20.6	20.4	21.2	19.2	14.4	13.9	18.3	15.1	22.6	19.9	19.4	19.0	19.6	19.4	23.2	19.8	18.4	17.8	20.7	19.9
Signal_Horn_S1	22.3	21.8	24.2	23.0	-0.6	-0.6	26.4	25.6	25.5	23.6	22.1	21.5	22.4	21.8	25.0	22.2	21.0	19.5	23.0	20.5
Polarmatic_Enclosure_Vent	13.2	12.6	11.6	9.8	9.2	9.3	17.1	16.8	21.3	20.6	11.3	11.1	12.5	12.3	12.2	9.1	7.5	7.4	11.9	11.4
Dust_Collector	25.4	25.5	25.9	26.1	18.5	18.0	23.2	23.7	24.9	24.9	25.5	25.5	25.8	25.8	28.1	26.6	25.4	24.8	26.1	25.2
Concrete_Truck_Passby_S1	28.1	27.7	28.8	27.1	20	19.2	29.9	29.4	32.6	28.6	35.1	34.8	37.7	37.4	42.6	41.1	37.9	38.6	35.6	34.7
Powder_Truck_Passby	-82.3	-82.8	-82.1	-84.1			-80.9	-81.6	-79.3	-81.9	-74.9	-75.4	-72.4	-72.8	-67.4	-69.0	-72.1	-71.4	-74.3	-75.3
Loader_JD544K_Beeper	-65.1	-64.8	-63.9	-65.9	-69.3	-72.3	-63.5	-63.1	-61.6	-62.8	-63.6	-63.5	-63.1	-62.9	-59.5	-62.6	-64.9	-65.2	-62.9	-62.9
Total	34.4	34.1	35.5	33.2	27.0	26.4	36.3	35.8	37.2	34.1	37.0	36.7	38.9	38.6	43.4	41.7	38.8	39.3	37.8	36.8

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.7.3 Point of Reception Impacts by Source for Scenario 3*

	POR 1 W	POR 1 OPR	POR 2 W	POR 2 OPR	POR 3 W	POR 3 OPR	POR 4 W	POR 4 OPR	POR 5 W	POR 5 OPR	POR 6 W	POR 6 OPR	POR 7 W	POR 7 OPR	POR 8 W	POR 8 OPR	POR 9 W	POR 9 OPR	POR 10 W	POR 10 OPR
Sources	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Polarmatic_Enclosure_Vent	13.2	12.6	11.6	9.8	9.2	9.3	17.1	16.8	21.3	20.6	11.3	11.1	12.5	12.3	12.0	9.0	7.5	7.4	11.9	11.3
Dust_Collector	25.4	25.5	25.9	26.1	18.5	18.0	23.2	23.7	24.9	24.9	25.5	25.5	25.8	25.8	28.1	26.6	25.4	24.8	26.1	25.2
Powder_Truck_Unloading	30.9	30.8	29.3	29.4	21	20.5	21.4	21.4	29.5	27.9	26.5	26.2	26.9	26.5	30.0	26.7	25.0	24.4	27.2	26.8
Aggregate_Truck_Unloading	29.2	29.3	28.2	28.5	23.5	22.9	31.6	31.2	31.8	29.6	26.3	26.1	26.6	26.5	30.9	28.1	26.4	26.1	28.9	28.1
Concrete_Truck_Loading_S2	23.2	23.4	24.7	23.3	17.1	17.2	26.2	26.8	25.0	24.5	22.6	22.7	22.9	23.0	25.1	22.8	21.2	21.0	22.9	22.0
Concrete_Truck_Slump_Mix_S2	37.4	37.1	38.8	35.1	30.5	29.9	39.9	39.3	37.7	34.3	32.5	32.7	32.9	33.2	35.5	33.4	31.4	31.3	38.0	33.6
Concrete_Truck_Washout_S2	26.6	26.5	27.3	25.2	20.4	20.0	24.3	21.1	28.6	25.9	21.1	21.1	21.4	21.5	29.3	25.9	24.4	23.8	26.8	26.0
Signal_Horn_S2	28.3	27.8	30.2	29.0	5.4	5.5	32.4	31.7	31.5	29.6	28.1	27.5	28.5	27.8	31.0	28.3	27.0	25.5	29.0	26.5
Powder_Truck_Passby	17.7	17.2	17.8	15.8	9.0	5.9	19.1	18.4	20.7	18.1	25.0	24.6	27.6	27.2	32.6	31.0	27.9	28.6	25.6	24.6
Concrete_Truck_Passby_S2	34.8	34.3	35.5	33.8	26.8	25.6	36.6	36.1	39.2	35.2	41.8	41.4	44.3	44.0	49.3	47.8	44.6	45.3	42.3	41.3
Aggregate_Truck_Passby_S2	6.8	6.4	6.6	4.8	-1.1	-4.2	8.1	7.3	9.7	7.3	13.5	13.0	15.8	15.3	20.9	18.9	16.0	16.6	14.1	12.8
Loader_JD544K_Beeper	34.9	35.2	36.1	34.1	30.7	27.7	36.5	36.9	38.4	37.2	36.3	36.4	36.0	36.2	36.5	33.5	32.9	32.0	36.4	36.3
Total	41.9	41.7	42.8	40.7	35.3	33.9	43.6	43.3	44.2	41.7	43.7	43.5	45.6	45.4	50.0	48.4	45.4	45.9	45.0	43.6

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.7.4 Point of Reception Impacts by Source for Scenario 4*

	POR 1 W	POR 1 OPR	POR 2 W	POR 2 OPR	POR 3 W	POR 3 OPR	POR 4 W	POR 4 OPR	POR 5 W	POR 5 OPR	POR 6 W	POR 6 OPR	POR 7 W	POR 7 OPR	POR 8 W	POR 8 OPR	POR 9 W	POR 9 OPR	POR 10 W	POR 10 OPR
Sources	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Polarmatic_Enclosure_Vent	13.2	12.6	11.6	9.8	9.2	9.3	17.1	16.8	21.3	20.6	11.3	11.1	12.5	12.3	12.0	9.0	7.5	7.4	11.9	11.3
Dust_Collector	25.4	25.5	25.9	26.1	18.5	18.0	23.2	23.7	24.9	24.9	25.5	25.5	25.8	25.8	28.1	26.6	25.4	24.8	26.1	25.2
Concrete_Truck_Loading_S2	18.4	18.6	19.9	18.5	12.4	12.5	21.5	22.0	20.2	19.8	17.8	18.0	18.2	18.2	20.3	18.0	16.5	16.2	18.1	17.2
Concrete_Truck_Slump_Mix_S2	32.7	32.4	34.0	30.4	25.7	25.1	35.1	34.5	33.0	29.5	27.8	28.0	28.1	28.4	30.7	28.7	26.6	26.5	33.2	28.8
Concrete_Truck_Washout_S2	21.9	21.7	22.5	20.4	15.6	15.2	19.5	16.4	23.8	21.1	16.4	16.3	16.6	16.7	24.5	21.1	19.6	19.0	22.0	21.2
Signal_Horn_S2	23.5	23.0	25.4	24.2	0.6	0.7	27.6	26.8	26.7	24.8	23.3	22.7	23.7	23.0	26.2	23.4	22.2	20.7	24.2	21.7
Powder_Truck_Passby	-82.3	-82.8	-82.2	-84.2			-80.9	-81.6	-79.3	-81.9	-75.0	-75.4	-72.4	-72.8	-67.4	-69.0	-72.1	-71.4	-74.4	-75.4
Concrete_Truck_Passby_S2	29.3	28.9	30	28.4	21.3	20.2	31.1	30.6	33.8	29.8	36.3	36.0	38.9	38.6	43.8	42.3	39.1	39.8	36.9	35.8
Loader_JD544K_Beeper	-65.1	-64.8	-63.9	-65.9	-69.3	-72.3	-63.5	-63.1	-61.6	-62.8	-63.7	-63.6	-64.0	-63.8	-63.5	-66.5	-67.1	-68.0	-63.6	-63.7
Total	35.5	35.2	36.6	34.2	28.1	27.4	37.5	36.9	37.5	34.5	37.5	37.2	39.6	39.4	44.3	42.7	39.7	40.3	39.0	37.2

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8 Distance Source to Point of Reception

	POR 1 W	POR 1 OPR	POR 2 W	POR 2 OPR	POR 3 W	POR 3 OPR	POR 4 W	POR 4 OPR	POR 5 W	POR 5 OPR	POR 6 W	POR 6 OPR	POR 7 W	POR 7 OPR	POR 8 W	POR 8 OPR	POR 9 W	POR 9 OPR	POR 10 W	POR 10 OPR
Sources	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
Concrete_Truck_Loading	453	438	539	511	1050	1027	457	430	511	482	425	412	414	404	457	455	458	457	469	458
Concrete_Truck_Slump_Mix	404	390	508	480	1086	1063	497	469	495	466	390	377	376	366	409	406	406	405	414	403
Concrete_Truck_Washout	408	393	491	463	1040	1017	505	478	538	509	436	424	422	413	454	450	448	448	454	443
Signal_Horn	456	441	543	515	1054	1031	453	426	506	478	421	409	411	401	455	453	457	455	468	457
Polarmatic_Enclosure_Vent	463	447	540	512	1029	1006	455	428	529	500	446	434	436	426	479	478	480	479	490	480
Dust_Collector	442	427	526	497	1042	1019	470	443	522	494	433	421	421	411	461	459	460	459	470	459
Powder_Truck_Unloading	438	423	524	495	1048	1024	472	446	518	490	427	415	415	405	455	452	454	452	463	452
Aggregate_Truck_Unloading	417	401	487	459	1013	990	507	481	561	532	463	451	449	439	481	477	474	474	479	468

Table A2.9 Sample Calculations – Scenario 1

Receiver
Name: POR_1
ID: POR_1_POW
X: 18311161.98 m
Y: 5099045.24 m
Z: 160.00 m

Point Source, ISO 9613, Name: "Concrete_Truck_Loading", ID: "Concrete_Truck_Loading_S1"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
1	18310859.99	5098707.48	161.44	0	D	32	62.4	0.0	-0.8	0.0	0.0	64.1	0.0	-4.8	1.3	0.0	8.6	0.0	0.0	-7.6
1	18310859.99	5098707.48	161.44	0	D	63	88.9	0.0	-0.8	0.0	0.0	64.1	0.1	-4.8	1.3	0.0	11.1	0.0	0.0	16.3
1	18310859.99	5098707.48	161.44	0	D	125	91.6	0.0	-0.8	0.0	0.0	64.1	0.2	4.2	2.0	0.0	10.2	0.0	0.0	10.1
1	18310859.99	5098707.48	161.44	0	D	250	94.2	0.0	-0.8	0.0	0.0	64.1	0.5	6.7	2.6	0.0	10.7	0.0	0.0	8.9
1	18310859.99	5098707.48	161.44	0	D	500	104.0	0.0	-0.8	0.0	0.0	64.1	0.9	1.7	3.3	0.0	18.1	0.0	0.0	15.2
1	18310859.99	5098707.48	161.44	0	D	1000	107.8	0.0	-0.8	0.0	0.0	64.1	1.7	-0.4	3.9	0.0	19.8	0.0	0.0	17.9
1	18310859.99	5098707.48	161.44	0	D	2000	106.1	0.0	-0.8	0.0	0.0	64.1	4.4	-0.6	5.2	0.0	19.9	0.0	0.0	12.3
1	18310859.99	5098707.48	161.44	0	D	4000	96.7	0.0	-0.8	0.0	0.0	64.1	14.8	-0.6	5.9	0.0	20.0	0.0	0.0	-8.3
1	18310859.99	5098707.48	161.44	0	D	8000	88.3	0.0	-0.8	0.0	0.0	64.1	53.0	-0.6	7.8	0.0	20.0	0.0	0.0	-56.8
1	18310859.99	5098707.48	161.44	0	N	32	62.4	0.0	-6.0	0.0	0.0	64.1	0.0	-4.8	1.3	0.0	8.6	0.0	0.0	-12.8
1	18310859.99	5098707.48	161.44	0	N	63	88.9	0.0	-6.0	0.0	0.0	64.1	0.1	-4.8	1.3	0.0	11.1	0.0	0.0	11.1
1	18310859.99	5098707.48	161.44	0	N	125	91.6	0.0	-6.0	0.0	0.0	64.1	0.2	4.2	2.0	0.0	10.2	0.0	0.0	4.9
1	18310859.99	5098707.48	161.44	0	N	250	94.2	0.0	-6.0	0.0	0.0	64.1	0.5	6.7	2.6	0.0	10.7	0.0	0.0	3.6
1	18310859.99	5098707.48	161.44	0	N	500	104.0	0.0	-6.0	0.0	0.0	64.1	0.9	1.7	3.3	0.0	18.1	0.0	0.0	10.0
1	18310859.99	5098707.48	161.44	0	N	1000	107.8	0.0	-6.0	0.0	0.0	64.1	1.7	-0.4	3.9	0.0	19.8	0.0	0.0	12.7
1	18310859.99	5098707.48	161.44	0	N	2000	106.1	0.0	-6.0	0.0	0.0	64.1	4.4	-0.6	5.2	0.0	19.9	0.0	0.0	7.0
1	18310859.99	5098707.48	161.44	0	N	4000	96.7	0.0	-6.0	0.0	0.0	64.1	14.8	-0.6	5.9	0.0	20.0	0.0	0.0	-13.5
1	18310859.99	5098707.48	161.44	0	N	8000	88.3	0.0	-6.0	0.0	0.0	64.1	53.0	-0.6	7.8	0.0	20.0	0.0	0.0	-62.0
1	18310859.99	5098707.48	161.44	0	E	32	62.4	0.0	-6.0	0.0	0.0	64.1	0.0	-4.8	1.3	0.0	8.6	0.0	0.0	-12.8
1	18310859.99	5098707.48	161.44	0	E	63	88.9	0.0	-6.0	0.0	0.0	64.1	0.1	-4.8	1.3	0.0	11.1	0.0	0.0	11.1
1	18310859.99	5098707.48	161.44	0	E	125	91.6	0.0	-6.0	0.0	0.0	64.1	0.2	4.2	2.0	0.0	10.2	0.0	0.0	4.9
1	18310859.99	5098707.48	161.44	0	E	250	94.2	0.0	-6.0	0.0	0.0	64.1	0.5	6.7	2.6	0.0	10.7	0.0	0.0	3.6
1	18310859.99	5098707.48	161.44	0	E	500	104.0	0.0	-6.0	0.0	0.0	64.1	0.9	1.7	3.3	0.0	18.1	0.0	0.0	10.0
1	18310859.99	5098707.48	161.44	0	E	1000	107.8	0.0	-6.0	0.0	0.0	64.1	1.7	-0.4	3.9	0.0	19.8	0.0	0.0	12.7
1	18310859.99	5098707.48	161.44	0	E	2000	106.1	0.0	-6.0	0.0	0.0	64.1	4.4	-0.6	5.2	0.0	19.9	0.0	0.0	7.0
1	18310859.99	5098707.48	161.44	0	E	4000	96.7	0.0	-6.0	0.0	0.0	64.1	14.8	-0.6	5.9	0.0	20.0	0.0	0.0	-13.5
1	18310859.99	5098707.48	161.44	0	E	8000	88.3	0.0	-6.0	0.0	0.0	64.1	53.0	-0.6	7.8	0.0	20.0	0.0	0.0	-62.0

Point Source, ISO 9613, Name: "Concrete_Truck_Slump_Mix", ID: "Concrete_Truck_Slump_Mix_S1"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
2	18310871.11	5098764.45	161.00	0	D	32	58.6	0.0	-0.8	0.0	0.0	63.1	0.0	-4.7	1.3	0.0	0.0	0.0	0.0	-1.9
2	18310871.11	5098764.45	161.00	0	D	63	80.3	0.0	-0.8	0.0	0.0	63.1	0.0	-4.7	1.3	0.0	0.0	0.0	0.0	19.7
2	18310871.11	5098764.45	161.00	0	D	125	86.5	0.0	-0.8	0.0	0.0	63.1	0.2	4.9	1.9	0.0	0.0	0.0	0.0	15.6
2	18310871.11	5098764.45	161.00	0	D	250	96.1	0.0	-0.8	0.0	0.0	63.1	0.4	7.5	2.5	0.0	0.0	0.0	0.0	21.8
2	18310871.11	5098764.45	161.00	0	D	500	99.2	0.0	-0.8	0.0	0.0	63.1	0.8	2.0	3.1	0.0	0.0	0.0	0.0	29.4
2	18310871.11	5098764.45	161.00	0	D	1000	103.1	0.0	-0.8	0.0	0.0	63.1	1.5	-0.1	3.8	0.0	0.0	0.0	0.0	34.0
2	18310871.11	5098764.45	161.00	0	D	2000	102.2	0.0	-0.8	0.0	0.0	63.1	3.9	-0.2	5.0	0.0	0.0	0.0	0.0	29.6
2	18310871.11	5098764.45	161.00	0	D	4000	97.4	0.0	-0.8	0.0	0.0	63.1	13.2	-0.2	5.7	0.0	0.0	0.0	0.0	14.8
2	18310871.11	5098764.45	161.00	0	D	8000	89.9	0.0	-0.8	0.0	0.0	63.1	47.3	-0.2	7.5	0.0	0.0	0.0	0.0	-28.6
2	18310871.11	5098764.45	161.00	0	N	32	58.6	0.0	-6.0	0.0	0.0	63.1	0.0	-4.7	1.3	0.0	0.0	0.0	0.0	-7.2
2	18310871.11	5098764.45	161.00	0	N	63	80.3	0.0	-6.0	0.0	0.0	63.1	0.0	-4.7	1.3	0.0	0.0	0.0	0.0	14.5
2	18310871.11	5098764.45	161.00	0	N	125	86.5	0.0	-6.0	0.0	0.0	63.1	0.2	4.9	1.9	0.0	0.0	0.0	0.0	10.4
2	18310871.11	5098764.45	161.00	0	N	250	96.1	0.0	-6.0	0.0	0.0	63.1	0.4	7.5	2.5	0.0	0.0	0.0	0.0	16.5
2	18310871.11	5098764.45	161.00	0	N	500	99.2	0.0	-6.0	0.0	0.0	63.1	0.8	2.0	3.1	0.0	0.0	0.0	0.0	24.1
2	18310871.11	5098764.45	161.00	0	N	1000	103.1	0.0	-6.0	0.0	0.0	63.1	1.5	-0.1	3.8	0.0	0.0	0.0	0.0	28.8
2	18310871.11	5098764.45	161.00	0	N	2000	102.2	0.0	-6.0	0.0	0.0	63.1	3.9	-0.2	5.0	0.0	0.0	0.0	0.0	24.3
2	18310871.11	5098764.45	161.00	0	N	4000	97.4	0.0	-6.0	0.0	0.0	63.1	13.2	-0.2	5.7	0.0	0.0	0.0	0.0	9.6
2	18310871.11	5098764.45	161.00	0	N	8000	89.9	0.0	-6.0	0.0	0.0	63.1	47.3	-0.2	7.5	0.0	0.0	0.0	0.0	-33.8
2	18310871.11	5098764.45	161.00	0	E	32	58.6	0.0	-6.0	0.0	0.0	63.1	0.0	-4.7	1.3	0.0	0.0	0.0	0.0	-7.2
2	18310871.11	5098764.45	161.00	0	E	63	80.3	0.0	-6.0	0.0	0.0	63.1	0.0	-4.7	1.3	0.0	0.0	0.0	0.0	14.5
2	18310871.11	5098764.45	161.00	0	E	125	86.5	0.0	-6.0	0.0	0.0	63.1	0.2	4.9	1.9	0.0	0.0	0.0	0.0	10.4
2	18310871.11	5098764.45	161.00	0	E	250	96.1	0.0	-6.0	0.0	0.0	63.1	0.4	7.5	2.5	0.0	0.0	0.0	0.0	16.5
2	18310871.11	5098764.45	161.00	0	E	500	99.2	0.0	-6.0	0.0	0.0	63.1	0.8	2.0	3.1	0.0	0.0	0.0	0.0	24.1
2	18310871.11	5098764.45	161.00	0	E	1000	103.1	0.0	-6.0	0.0	0.0	63.1	1.5	-0.1	3.8	0.0	0.0	0.0	0.0	28.8
2	18310871.11	5098764.45	161.00	0	E	2000	102.2	0.0	-6.0	0.0	0.0	63.1	3.9	-0.2	5.0	0.0	0.0	0.0	0.0	24.3

Appendix 3

Instrument Calibration Certificates

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Pylon Electronics Inc.
147 Colonnade Road
Ottawa, ON K2E 7L9

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CERTIFICATE OF CALIBRATION

Description	**SOUND ANALYZER**	**Work Order**	**N0909084**
Model Number	**2270**	**Serial Number**	**3008643**
Instrument Id	**N/A**	**Cal Procedure**	**BE1713-32**
Manufacturer	**BRUEL & KJAER**	**Cal Date**	**22 Feb 2021**
Customer Name	**FREEFIELD LTD.**	**Recall Cycle**	**52 Weeks**
		Next Cal Date	**22 Feb 2022**
		Purchase Order	**Credit Card**

Calibration Environment: Temperature **23.1 °C** Relative Humidity **36.2 %RH**

Received Condition: **Within Tolerance**

Completed Condition: **Within Tolerance**

Remarks: **The unit calibrated with Preamp ZC 0032 S/N 23073 and Mic 4189 S/N 2985656**

Standards Used to Establish Traceability

Instrument Type	Model	Asset #	Cal Due Date
SOUND LEVEL CALIBRATOR	4231	240-1151	15 Sep 2021
1/2" MICROPHONE	4166	240-709	20 Jun 2021
PISTONPHONE	4220	354-017	2 Nov 2021
FFT SIGNAL ANALYZER SYSTEM	3550	354-759	15 Oct 2021
MICROPHONE PREAMP	2639T	355-164	24 Feb 2021

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined on the Test Data Sheet (TDS), unless otherwise indicated. The Certificate received and completed conditions and the TDS specifications are based on the procedure(s) and/or specification(s) referenced on the TDS unless otherwise indicated. Any statement of compliance is made without taking measurement uncertainty into account and is based on the instrument's performance against the test limits documented on the test data sheet.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through a National Metrological Institute (such as NRC or NIST). Pylon's quality system meets the requirements of ISO/IEC 17025:2017. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

Test data As Found and Final (as left) results are the same unless reported otherwise. Certificate remarks identify if adjustments were performed.

Metrologist: *062* Quality Assurance: *301* Date of Issue: **23 Feb 2021** F063 Rev 16 pylcert

HALIFAX MONTREAL OTTAWA TORONTO EDMONTON CALGARY

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PYLON

Calibration Test Data

Description:	SOUND ANALYZER	Work order:	N0909084
Model:	2270	Serial:	3008643
Customer ID.:	N/A	Procedure:	BE1713-32
Manufacturer:	BRUEL & KJAER	Proc. Rev.:	23-Feb-2016
Customer:	FREEFIELD LTD.	Cal Date:	22-Feb-2021

TEST REF.	TEST DESCRIPTION	RESULTS MIN	AS FOUND	FINAL	MAX
P. 52	**SOUND LEVEL CALIBRATION**				
	CONNECT TI TO SOUND CALIBRATOR MODEL 4231,				
	SWITCH ON THE CALIBRATOR, PRESS "START" ON TI,				
	NOTE THAT TI INDICATING "DETECTING LEVEL"	Pass / Fail	Pass		
	WHILE TI SEARCHING FOR SIGNAL & SIGNAL IS				
	STABILISING, THE "TRAFFIC LIGHT" INDICATES				
	SHORT GREEN FLASH EVERY SECOND	Pass / Fail	Pass		
	WHEN SIGNAL IS STABLE, THE GREEN LIGHT IS				
	STABLE	Pass / Fail	Pass		
	WHEN CALIBRATION IS COMPLETED SUCCESSFULLY				
	THE TRAFFIC LIGHT INDICATES A SHORT YELLOW				
	FLASH EVERY 5 SECONDS	Pass / Fail	Pass		
	Nominal SPL with 4189 Microphone attached	dB	dB		dB
	93.8 dB	92.8	93.9		94.8
	CALIBRATION COMPLETED	Pass / Fail	Pass		

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Pylon Electronics Inc.
147 Colonnade Road
Ottawa, ON K2E 7L9

CERTIFICATE OF CALIBRATION

Description	**SOUND LEVEL CALIBRATOR**	**Work Order**	**N0909086**
Model Number	**4231**	**Serial Number**	**2730374**
Instrument Id	**N/A**	**Cal Procedure**	**33K3-4-2871-1**
Manufacturer	**BRUEL & KJAER**	**Cal Date**	**22 Feb 2021**
Customer Name	**FREEFIELD LTD.**	**Recall Cycle**	**52 Weeks**
		Next Cal Date	**22 Feb 2022**
		Purchase Order	**Credit Card**

Calibration Environment: Temperature **22.9 °C** Relative Humidity **35.2 %RH**

Received Condition: **Within Tolerance**

Completed Condition: **Within Tolerance**

Standards Used to Establish Traceability

Instrument Type	Model	Asset #	Cal Due Date
4145 BRUEL&KJAER 1" MICROPHONE	4145	240-054	11 Feb 2022
1/2" MICROPHONE	4166	240-709	20 Jun 2021
PISTONPHONE	4220	354-017	2 Nov 2021
FFT SIGNAL ANALYZER SYSTEM	3550	354-759	15 Oct 2021
MICROPHONE PREAMP	2639T	355-164	24 Feb 2021

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined on the Test Data Sheet (TDS), unless otherwise indicated. The Certificate received and completed conditions and the TDS specifications are based on the procedure(s) and/or specification(s) referenced on the TDS unless otherwise indicated. Any statement of compliance is made without taking measurement uncertainty into account and is based on the instrument's performance against the test limits documented on the test data sheet.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through a National Metrological Institute (such as NRC or NIST). Pylon's quality system meets the requirements of ISO/IEC 17025:2017. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

Test data As Found and Final (as left) results are the same unless reported otherwise. Certificate remarks identify if adjustments were performed.

Metrologist: *062* Quality Assurance: *301* Date of Issue: **23 Feb 2021** F083 Rev 16 pylon1

HALIFAX MONTREAL OTTAWA TORONTO EDMONTON CALGARY

PYLON

Calibration Test Data

Page 1 of 1

Description:	SOUND LEVEL CALIBRATOR	Work order:	N0909086
Model:	4231	Serial:	2730374
Customer ID.:	N/A	Procedure:	33K3-4-2871-1
Manufacturer:	BRUEL & KJAER	Proc. Rev.:	30-Oct-2006
Customer:	FREEFIELD LTD.	Cal Date:	22-Feb-2021

TEST REF.	TEST DESCRIPTION	RESULTS MIN	AS FOUND	FINAL	MAX
4.1	**Sound Level Calibration:**				
	Nominal dB_{SPL}	dB_{SPL}	dB_{SPL}		dB_{SPL}
	94.0	93.80	94.06		94.20
	(+20 dB Button) 114.0	113.80	114.06		114.20
4.2	**Frequency Calibration:**				
	Nominal (Hz)	Hz	Hz		Hz
	1 k	999.0	1000.0		1001.0
4.3	**Distortion Calibration :**				
	Measured Value	-	0.35 %		1.00 %
	ADDITIONAL TEST:				
	AUTO SHUT OFF	Pass / Fail	Pass		

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are withheld pursuant to section

sont retenues en vertu de l'article

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of the Freedom of Information and Protection of Privacy Act

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