



## **Source Testing Report**

### **ECA 6394-D78PR2: Conditions 11 and 12**

**ST MARYS CEMENT INC. (CANADA), ST. MARYS PLANT**

**ST. MARYS, ONTARIO**

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## **1 SOURCE TESTING EXECUTIVE SUMMARY**

St Marys Cement Inc. (Canada) is a cement manufacturing facility consisting of the following processes and support units;

- Raw material delivery, storage, processing, and transfers;
- Conventional and fuel processing, storage and handling;
- Alternative Low-Carbon Fuels Process, storage and handling;
- Clinker production – Cement Kiln operations
- Clinker storage and transfer; and
- Cement production including ball mills, cement storage, and shipping.

The facility is permitted clinker production at a rate of 1.1 million tonnes per year. The facility typically operates between 1,800-2,300 tonnes per day.

The Facility was issued an Amended Environmental Compliance Approval Number 6394-D78PR2 dated November 11, 2024 (included in APPENDIX A Environmental Compliance Approval ECA 6394–D78PR2). The company is required to perform Source Testing as per Condition 11 and Schedule G, and CO2 Intensity Testing as per Section 12 of the approval. The Source Test is required to be completed during use of ALCF in the main burner. Sections 2 to 4 of this report summarize how requirements under Conditions 11 and 12 and Appendix G of the ECA are fulfilled.

The testing, in accordance with procedures as laid out by the Ministry of Environment, Conservation and Parks (MECP), measured the rates of emission of the following parameters;

- Velocity, flow rate and temperature
- Particulate Matter (PM)
- Metals (as listed in ECA)
- Semi-Volatile Organic Compounds (SVOCs) (listed as Polycyclic Organic Matter)
- Dioxins and Furans and Dioxin-like PCB's (as listed in ECA)
- Hydrogen Chloride (HCl)
- Ammonia (NH3)
- Aldehydes (Acrolein, Acetaldehyde, Propionaldehyde)

- Alcohols (Methanol, Phenol)
- Volatile Organic Matter (VOCs as listed in the ECA)
- CEMS - Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Oxygen (O<sub>2</sub>)

St Marys Cement Inc. (Canada) retained RWDI for completion of the Source Testing, including both the Pre-Test plan and Stack Testing Summary Report. Source testing was completed April 8 to 11<sup>th</sup>, 2025 by RWDI, within 12 months of commencement of ALCF on site.

The Source Testing Report and results of Source Testing can be found in APPENDIX B **RWDI 2509873 DRF Source Sampling ECA 6394-D78P42**.

The following shows a comparison of the results with their applicable limits as listed in Schedule B of the ECA. The results show that the emission concentrations are below those outlined in the ECA for all parameters.

Parameter	Stack Testing Results	ECA Limits	Results
Limits in Schedule B Of the C of A 6394-D78PR2			
Particulate Matter	42.6 mg/Rm3	50 mg/Rm3	Pass
Cadmium	0.523 µg/Rm3	7 µg/Rm3	Pass
Lead	20.7 µg/Rm3	60 µg/Rm3	Pass
Mercury	< 2.61 µg/Rm3	20 µg/Rm3	Pass
Dioxins and Furans	< 31.6 pg/Rm3	80 pg/Rm3 ITEQ	Pass
Hydrochloric Acid	9.8 mg/Rm3	27 mg/Rm3	Pass

Concentrations at 250C, 101.3 kPa, dry and 11%O<sub>2</sub>

St Marys Cement Inc. (Canada) retained Ramboll Canada Inc. to update the Emission Summary Dispersion Modelling (ESDM) report in accordance with Section 26 of O. Reg 419/05 using the results from the Source Testing Report for the applicable contaminants. The results of dispersion calculations and the updated ESDM Emission Summary Table are included in this Source Testing report, included in APPENDIX C Ramboll ESDM Emissions Summary Table Ramboll .

## **2 CONDITION 11: SOURCE TESTING REQUIREMENTS**

Other data pertaining to the facility during the time of source testing as required by the ECA 6394-D78PR2 are included in this report as follows.

### **11.1. Condition 11.1. REGULAR ALCF USE (Main Burner)**

**11.1.a.** The Company shall perform Source Testing in accordance with the procedure in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H. Source Testing shall be conducted not later than twelve (12) months from the date of commencement of operation of the Alternative Low-Carbon Fuels feed equipment which permits the use of Alternative Low-Carbon Fuels up to 175 tonnes per day, or within a time frame as directed or agreed to in writing by the District Manager.

- St Marys Cement Plant began use of the ALCF on May 12, 2024. Source Testing was completed on April 8 to 11, 2025, within 12 months of the commencement of operation.
- Refer to APPENDIX D St Marys Cement ALCF Use 2024 to 2025.

**11.1.b.** The Company shall notify the District Manager in writing of the details of the installed equipment, date of installation and date of commencement of operation of the Alternative Low-Carbon Fuels feed equipment which permits the use of Alternative Low- Carbon Fuels up to 175 tonnes per day within two (2) weeks of the installation and the commencement of operation.

- Notification was sent to the MECP on June 6, 2025.
- Refer to APPENDIX E SMC Notification to MECP of Commencement of ALCF.

**11.1.c.** In addition to Source Testing required under Conditions 11.1.a of this Approval, Source Testing shall be repeated once every calendar year in accordance with the procedure in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H. Annual Source Testing is not required to be conducted in the year in which Source Testing required under Condition 11.1 was conducted.

- Source Testing was completed on April 8, 2025.
- Annual Source Testing will be completed beginning in 2026.

**11.1.d.** The Source Testing required under Conditions 11.1.a and 11.1.c of this Approval shall include, as a minimum, the rates of emissions of the test contaminants from the Cement Kiln stack, when the Cement Kiln is co-fired with Conventional Fuels and Alternative Low-Carbon Fuels, at an Alternative Low-Carbon Fuels maximum approved firing rate of 175 tonnes per day, or at a firing rate agreed to in writing by the Manager, subject to the condition that operational checks of the Cement Kiln are accepted by the Company. The Alternative Low-Carbon Fuels used during the Source Testing shall contain a representative blend of the Alternative Low-Carbon Fuels approved under Condition 7 of this Approval, with considerations of the market availability of Alternative Low-Carbon Fuels types and quantities at the time of Source Testing. The blend (s) of

Alternative Low-Carbon Fuels and quantity proposed to be used for the Source Testing shall be submitted along with the Pre-Test Plan to the Manager and the Director for approval, along with the details regarding the process for selection of the Alternative Low-Carbon Fuels blend (s) and quantity for Source Testing.

- The Pre-Test Plan to the MECP noted the following plant conditions were expected during the Source Testing
  - At the time of the sampling program, St. Marys will be operating at normal production rate. The Kiln is rated for 2,038 tonnes/day, however the normal production rate for the facility is between 1,700 and 2,200 tonnes/day of clinker.
  - Alternatives Fuels will be added at a rate between 72 to 96 tonnes/day.
  - The table below shows the average Alternative Fuels rate (tonnes per day) for the past months.

	Sept-24	Oct-24	Nov-24	Dec-24
Avg ALCF (TPD)	59.9	59.0	39.4	30.8
Avg ALCF (TPH)	2.50	2.46	1.64	1.28

- St. Marys will ensure the fuel firing will be in accordance with section 11.1(d) of the ECA. For the 2025 source test the proposed blend of Alternative Low Carbon Fuels is as follows:
  - Construction Wood waste: 25 – 50%
  - Plastic: 50 – 75%
  - The above blends were chosen based on market availability.
- The Pre Test Plan was submitted to the MECP on January 10, 2028. The Pre Test Plan was approved by the MECP on January 28, 2025.
- Refer to APPENDIX F RWDI Pre Test Plan St Marys 2025.

**11.1.e.** The Company shall perform Source Testing in accordance with the procedures in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H during the regular operation of the Electrolysis System. Source Testing shall be conducted not later than six (6) months from the date of commencement of operation of the Electrolysis System and shall be conducted while Conventional Fuels and Alternative Low-Carbon Fuels are used as required for Source Testing in Condition 11.1.d of this Approval.

- Operation of the Electrolysis System has not commenced at St Marys Cement.

**11.1.f.** The Company shall notify the District Manager in writing of the date of installation and the date of commencement of operation of the Electrolysis System within two (2) weeks of the installation and the commencement of operation.

- Operation of the Electrolysis System has not commenced at St Marys Cement.

**11.1.g.** The District Manager may relax the frequency and/or scope of the annual Source Testing required under Condition 11.1.c of this Approval, if the results of the annual Source Testing program indicate that the emissions and Point of Impingement concentrations of Compounds of Concern are consistently recorded as insignificant when substituting a portion of Conventional Fuels with Alternative Low-Carbon Fuels.

- The MECP has not relaxed the frequency and/or scope of the Source Testing.

**11.2. Condition 11.2. ALCF Demonstration Project Use (Back-end Riser)**

- The Source Testing Completed in 2025 did not include the ALCF Demonstration Project Use (Back End Riser).

### **3 SCHEDULE G: PROCEDURES FOR SOURCE TESTING**

#### **Schedule G: Procedures For Source Testing**

**Sch. G.1** The Company shall submit, not later than three (3) months prior to the Source Testing required under Conditions 11.1.a, 11.1.e, and 11.2.a of this Approval, a Pre-Test Plan for the Source Testing required under this Approval to the Manager and the Director. In addition to the required information, the Pre-Test plan shall also include information on the blend (s) of Alternative Low-Carbon Fuels and quantity proposed to be used for the Source Testing, along with details regarding the process for selection of the Alternative Low-Carbon Fuels blend (s) and quantity for Source Testing. The Company shall finalize the Pre-Test Plan in consultation with the Manager and the Director.

- The Pre Test Plan was submitted to the MECP on January 10, 2025. The Pre Test Plan was approved by the MECP on January 28, 2025.
- Source Testing was completed on April 8 to 11, 2025, less than 3 months after the pre-test plan was approved to the MECP.
- Refer to APPENDIX F RWDI Pre Test Plan St Marys 2025.

**Sch. G.2** The Company shall not commence the Source Testing until the Manager has accepted the Pre-Test Plan.

- The Pre Test Plan was submitted to the MECP on January 10, 2028. The Pre Test Plan was approved by the MECP on January 28, 2025.
- Refer to APPENDIX F RWDI Pre Test Plan St Marys 2025.

**Sch. G.3** For subsequent Source Testing under Condition 11.1.c of this Approval:

**Sch. G. 3. 1.** The Company shall submit either a written notification of intent to use a previously approved Pre-Test Plan (with version reference if there were more than one (1) previously approved Pre-Test Plan), or a new Pre-Test Plan, to the Manager and Director not later than three (3) months of the planned date of the Source Testing for approval. The written notification or the new Pre-Test Plan shall also include information on the blend (s) of Alternative Low-Carbon Fuel and the quantity proposed to be used for the Source Testing, along with details regarding the process for selection of the blend (s) for Source Testing for its finalization in consultation with the Manager and the Director.

**Sch. G. 3. 2.** If the Company submitted a written notification of intent to use a previously approved Pre-Test Plan, the Manager may either accept the use of a previously approved Pre-Test Plan, or request the submission of a new Pre-Test Plan for approval. The Company shall submit the requested new Pre-Test Plan within two (2) months after the Manager requested the submission.

**Sch. G. 3. 3.** The Company shall complete the subsequent Source Testing no later than three (3) months after the manager has either agreed with the written notification or approved the new Pre-Test Plan.

- Source Testing was completed on April 8, 2025
- Annual Source Testing will be completed in 2026.

**Sch. G.4** The Company shall notify the District Manager, the Manager and the Director in writing of the location, date and time of any impending Source Testing required by this Approval, at least fifteen (15) days prior to the Source Testing.

- Source Testing was completed on April 8, 2025.

**Sch. G.5** The Company shall submit a report (hardcopy and electronic format) on the Source Testing to the Manager and the District Manager not later than four (4) months after completing the Source Testing, or not later than a time frame agreed in writing with the Manager. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

**Sch. G.5.1** an executive summary;

- Refer to Section 1 Source Testing Executive Summary.

**Sch. G.5.2** results of Source Testing, including the emission rate, emission concentration and relevant emission factor of the Test Contaminants;

- Refer to APPENDIX B **RWDI 2509873 DRF Source Sampling ECA 6394-D78P42**.

**Sch. G.5.3** Records of operating conditions at the time of Source Testing and other information including but not limited to:

**Sch. G.5.3.a.** an executive summary

- Refer to APPENDIX G Source Testing Operating Conditions

**Sch. G.5.3.b.** A summary of the results of the fuel analysis program specified in Condition 8.9 of this approval;



- Note: Condition 8.9 of the ECA 6394-D78PR2 References data during to be recorded during kiln operation. Condition 9.1 of the ECA references the Fuel Analysis Program for Alternative Low Carbon Fuels analysis.
- Refer to APPENDIX G Source Testing Operating Conditions

**Sch. G.5.3.c.** a summary of records specified in condition 8.9 of this Approval and records of operating conditions at the time of Source Testing, including but not limited to:

- i. Clinker production rate in tonnes/hour
- ii. Conventional Fuels fired in the Cement Kiln in tonnes/hour
- iii. Each category of the Alternative Low-Carbon Fuels described in condition 7.1 of the Approval fired in the Cement Kiln in tonnes/day;
- iv. iv. Fuel Adjunct Material and Industrial By-Product Material input into the Cement Kiln in tonnes/day;
- Refer to APPENDIX G Source Testing Operating Conditions

**Sch. G.5.3.d.** any other records that may affect the Source Testing results.

- Refer to APPENDIX G Source Testing Operating Conditions

**Sch. G.5.4** A summary of all records of the CEM System and CPM System for the parameters specified in Condition 10 of this Approval at the time of Source Testing;

- Refer to APPENDIX H Source Testing CEM and CPM

**Sch. G.5.5** A summary table that compares the Source Testing results to the emission estimates described in the Company's application, the ESDM Report and the Performance Limits;

- Refer to APPENDIX C Ramboll ESDM Emissions Summary Table.

**Sch. G.8** If the Source Testing results are higher than the emission estimates in the Company's ESDM Report, the Company shall update their ESDM Report in accordance with Section 26 of O. Reg. 419/05 with the results from the Source Testing report and make these records available for review by staff of the Ministry upon request. The updated Emission Summary Table from the updated ESDM Report shall be submitted with the report on the Source Testing.

- St Marys Cement updated the ESDM with the results of the Source Testing.
- Refer to APPENDIX C Ramboll ESDM Emissions Summary Table.

**Sch. G.9** The Company shall ensure that the above mentioned Source Testing report is made available and easily accessible for review by the public at the Facility immediately after the document is submitted to the Ministry.

- St Marys Cement has made this Source Testing Report publicly available on the St Marys Cement Website.

#### **4 CONDITION 12: CO2 INTENSITY REPORT**

Condition 12.1 of ECA 6394-D78PR2 notes

**12.1.** The Company shall perform Carbon-Dioxide Emission Intensity testing of the representative samples of the Alternative Low-Carbon Fuels and Conventional Fuels at all times when Source Testing is carried out under Condition 11 of this Approval. Representative samples of the Alternative Low-Carbon Fuels and Conventional Fuels used during the Source Testing events shall be used for performing Carbon-Dioxide Emission Intensity testing. The Carbon-Dioxide Emission Intensity testing shall be carried out in accordance with the requirements set out in O. Reg. 79/15.

- Refer to APPENDIX I Condition 12 CO2 Intensity Report

## **5 APPENDICES**

**APPENDIX A. Environmental Compliance Approval ECA 6394–D78PR2**

**APPENDIX B. RWDI 2509873 DRF Source Sampling ECA 6394-D78P42**

**APPENDIX C. Ramboll ESDM Emissions Summary Table**

**APPENDIX D. St Marys Cement ALCF Use 2024 to 2025**

**APPENDIX E. SMC Notification to MECP of Commencement of ALCF**

**APPENDIX F. RWDI Pre Test Plan St Marys 2025**

**APPENDIX G. Source Testing Operating Conditions**

**APPENDIX H. Source Testing CEM and CPM Data**

**APPENDIX I. Condition 12 CO2 Intensity Report**