MELIADINE GOLD MINE

Incineration and Composter Waste Management Plan

NOVEMBER 2021

VERSION 7_NIRB

ᐊᒡᓃᑯ ᐄᒍ ᐅᓴᕋᑦᑕᓇᐊᒃᑯᑦ (ᐊᒡᓃᑯᒃᑯᑦ) ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᓴᕋᑦᑕᓇᐊᓕᐅᖅᐸᓪᓕᐊᔪᑦ (ᐅᓴᕋᑦᑕᓇᐊᖅ), 25 ᑭᓛᒥᑕᓂᒃ ᐅᖓᓯᒃᑎᕆᔪᖅ ᐅᐊᖕᓇᖓᓂᑦ ᑲᖏᖅᓵᓂᐅᑉ, ᐊᒻᒪ 80 ᑭᓛᒥᑕᓂᒃ ᐅᖓᓯᒃᑎᕆᑉᐳᓂ ᓂᕆᐊᓂᑦ ᐱᖓᖕᓇᖅᐸᓯᐊᓂᑦ ᐃᒡᓗᓕᒫᕐᔫᑉ ᑭᕙᓪᓕᕐᒥᑦ ᓄᓇᕗᒻᒥᑦ. ᓈᒻᒪᕆᔭᐅᔪᖅ ᐱᓕᕆᐊᖅ ᒫᓐᓇᐅᔪᖅ ᐊᐅᓛᖅᑎᑦᑎᔪᖅ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔪᒥᑦ ᐊᒻᒪ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᓴᕋᑦᑕᓇᐊᓂᕐᒥᑦ ᐱᕙᓪᓕᐊᓂᐊᕐᓗᒍ ᑎᓇᒐᓂᐊᕐᒥᑦ ᒨᓗᑕᓕᒃ, ᒪᕐᕉᖕᓂᒃ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔫᒃᑯᑦ (ᑎᓇᒐᓂᐊᖅ 1 ᐊᒻᒪ ᑎᓇᒐᓂᐊᖅ 2) ᐊᒻᒪ ᐊᑕᐅᓯᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᓴᕋᑦᑕᓇᐊᖅ. ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᖅ ᐊᐅᓛᖅᑎᑦᑎᓂᐊᖅᑐᖅ ᖃᐸᓯᐊᕐᔪᖕᓂᑦ ᐊᓯᖏᓐᓂᑦ ᓄᓇᒥᑦ ᐃᓗᑦᑐᖅᓯᒪᔪᓂᑦ ᐊᒻᒪ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᓴᕋᑦᑕᓇᐊᓂᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᐊᖅᑐᖅ ᐊᐅᓛᕐᓂᓇᔭᖓᓂᑦ ᐅᓴᕋᑦᑕᓇᐊᑉ 2043-ᒧᑦ ᑎᑭᓪᓗᒍ.

ᑕᑕᖅᑲᕐᒦᑦᑐᖅ ᐃᑯᐊᓪᓚᒃᑎᓇᕝᕕᖕᒥᑦ ᐊᒻᒪ ᓂᕿᕕᓂᕐᓂᒃ ᐊᒃᑕᒍᓇᓂᕐᒧᑦ ᐊᐅᓚᑦᑎᓂᕐᒥᒃ ᐸᕐᓇᐅᑎᒥᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᓴᕋᑦᑕᓇᐊᕐᒧᑦ. ᐸᕐᓇᐅᑎ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᖅ ᒪᓕᒡᓗᒋᑦ ᐱᐅᓛᒃᑯᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᖅᑲᑦᑕᖅᑐᑦ, ᑲᓇᑕᒥᑦ ᐊᕙᑎᒥᒃ ᐊᒻᒪ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᔪᓕᕆᔾᔭᒃᑯᖏᑦᑕ *ᐱᓕᕆᐊᕐᒧᑦ ᑎᑎᖅᑲᖅ ᑲᑎᓯᒪᔪᑦ ᐊᒃᑕᒐᖅᑕᐅᔪᓂᒃ ᐃᑯᐊᓪᓚᒃᑎᓇᓂᕐᒧᑦ*, ᐊᒻᒪ ᒪᓕᒃᑕᐅᔪᒃᓴᐃᑦ ᐱᔭᐅᓚᐅᖅᑐᑦ ᐊᕙᑎᓕᓇᔾᑯᓐᓂᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᓴᕋᑦᑕᓇᐊᕐᒧᑦ.

ᓯᑎᔪᓂᒃ ᐊᒃᑕᒋᖅᑕᐅᔪᓂᒃ ᐃᑯᐊᓪᓚᒃᑎᓇᕚᑦ ᐊᒻᒪ ᐊᒃᑕᒋᖅᑕᐅᔪᓂᒃ ᐅᖅᓯᐊᓗᖕᒥᑦ ᐃᑯᐊᓪᓚᒃᑎᕈᑏᑦ ᐊᐅᓚᑕᐅᔪᑦ ᓄᓇᕗᒻᒥ ᒪᓕᒃᑯᒋᑦ *ᓄᓇᕗᒻᒥᑦ ᐃᓄᒃᑖᓂᒃ ᐋᓐᓂᐊᖅᑲᖅᑕᐃᓕᒪᔪᓕᕆᓂᕐᒧᑦ ᐱᕐᑯᔭᖅ, ᓄᓇᕗᒻᒥ ᐊᕙᑎᒥᒃ ᒥᐊᓂᖅᓯᓂᕐᒧᑦ ᐱᕐᑯᔭᖅ*, ᐊᒻᒪ *ᒐᕙᒪᑐᖅᑲᒃᑯᑦ ᐊᕙᑎᒥᒃ ᒥᐊᓂᖅᓯᓂᕐᒧᑦ ᐱᕐᑯᔭᖅ*. ᖃᓄᐃᓕᐅᕐᓂᕐᒧᑦ ᑭᒡᓕᐅᔪᑦ ᐃᑯᐊᓪᓚᒃᑎᕈᑎᒧᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᓴᕋᑦᑕᓇᐊᕐᒥᑦ ᒪᓕᒃᑐᖅ ᐊᓂᐊᔪᓄᑦ ᒪᓕᒃᑕᐅᔪᒃᓴᓂᒃ ᐋᖅᑭᑕᐅᓯᒪᔪᑦ ᑲᓇᑕᒥᑦ ᑲᑎᒪᔩᑦ ᒥᓂᔅᑕᐅᑎᓄᑦ ᐊᕙᑎᒥᑦ. ᐊᖅᓴᐃᑦ ᐱᔪᑦ ᐃᑯᐊᓪᓚᒃᑎᕈᑎᒥᑦ ᐊᒃᑕᒋᖅᑕᐅᖅᑲᖅᑐᑦ ᒪᓕᒡᓗᒋᑦ *ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᓇᓂᕐᒧᑦ ᒪᓕᒃᑕᐅᔪᒃᓴᐃᑦ ᐱᓕᕆᕝᕕᒡᔪᐊᕐᓂᑦ ᐊᒃᑕᑯᓂᒃ ᐊᒃᑕᒋᓇᓂᕐᓄᑦ.*

ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᓴᕋᑦᑕᓇᐊᖅ ᐊᐅᓛᖅᑎᖅᑲᖅᑕᖅᑕᖓᑦ ᐃᑯᐊᓪᓚᒃᑎᕈᑎᖓᑦ ᒪᓕᒡᓗᒋᑦ ᑲᓇᑕᒥᑦ ᐊᕙᑎᒥᒃ ᐊᒻᒪ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᔪᓕᕆᔾᔭᒃᑯᑦ *ᐱᓕᕆᐊᕐᒧᑦ ᑎᑎᖅᑲᖅ ᑲᑎᓯᒪᔪᑦ ᐊᒃᑕᒐᖅᑕᐅᔪᓂᒃ ᐃᑯᐊᓪᓚᒃᑎᓇᓂᕐᒧᑦ*. ᐃᓕᕆᔭᐅᑉᐳᓂ ᐃᑯᐊᓪᓚᒃᑎᕈᑎᒧᑦ, ᐊᑐᓕᖅᑎᑕᐅᓂᖓ ᐊᒃᑯᓂᒃ ᐊᑉᑎᓇᓅᑦ ᑭᒡᓕᖅᑲᖅᑎᑦᑎᔪᖅ ᐊᓂᐊᔪᓂᑦ (ᓲᕐᓗ, ᑕᐃᕚᒃᓯᓐ (dioxins) ᐊᒻᒪ ᕘᕌᓐ (furans), ᓄᖑᓯᐃᑦᑐᖅ (mercury) ᐃᑯᐊᓪᓚᒃᑎᕈᑎᒥᙵᓖᖅᑐᓂᒃ.

ᐊᓂᖅᓵᖅᑐᖅᑕᑉᑎᖕᓂᑦ ᐊᐅᓚᑦᑎᔪᖅ, ᑲᑎᒪᔪᓂᑦ, ᒪᕐᕉᖕᓂᒃ ᑐᖅᑯᐊᓕᒃ ᐃᑯᐊᓪᓚᒃᑎᕈᑎ ᐃᓕᓴᐅᓯᒪᔪᖅ - ECO 1.75TN 1PVC100L 16-1MS. ᐱᒻᒪᓇᐅᔪᒥᒃ ᐱᕙᓪᓕᐊᓂᕐᒥᑦ ᑭᒡᓕᖏᓐᓄᑦ, ᓲᕐᓗ ᐆᓇᕐᓂᐅᑉ, ᐃᑯᐊᓛᖅᑑᑉ ᐊᓂᐊᓂᖓ, ᐊᒻᒪ ᐃᑯᐊᓛᖅᑎᑦᑎᔪᑦ ᖃᓇᑕᐅᔭᒃᑯᑦ ᐊᐅᓚᑕᐅᔪᑦ ᐃᑯᐊᓛᖅᑐᑦ ᐊᐅᓚᑕᐅᓂᐊᖅᑐᑎᒃ. ᐃᑯᐊᓪᓚᒃᑎᕈᑎ ᐃᑯᐊᓪᓚᒃᑎᑦᑎᔪᖕᖃᑦᑕᖅᑐᑦ 1,500-ᓗᐊᓂᒃ ᑭᓗᒍᕖᓂᒃ ᐅᐸᓗᑕᒦᒃᑯᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᔪᑦ ᐊᖏᑎᒋᓂᖏᑦ ᐊᒃᑯᓕᐊᖑᔪᑦ ᐅᓴᕋᑦᑕᓇᐊᕐᒥᑦ. ᐊᒃᑯᓂᒃ ᐊᐅᓚᑦᑎᑎᕝᕕᖏᑦᑐᖅ[1] ᐊᒻᒪ ᐊᐅᓚᖅᑎᑕᐅᖅᑲᖅᑐᖅ ᐊᔪᕈᖕᓃᖅᓴᖅᓯᒪᔪᑦ ᐱᓕᕆᔨᓄᑦ.

[1]ᖃᐅᔨᒪᔭᐅᖕᒥᑦ ᐃᑯᐊᓪᓚᒃᑎᑦᑎᕝᕕᖕᒥᑦ.

ᖃᐅᔨᓴᐃᓂᖃᕐᓂᐊᖅᑐᑦ ᐊᒻᒪᓗ ᐆᒃᑐᕆᐃᓂᖃᕐᓗᑎᒃ ᐃᑯᐊᓪᓚᒃᑎᑦᑎᖕᕕᐅᑉ ᑐᖅᓱᐊᖕᒋᓐᓂᑦ ᐊᓂᐊᔪᓂᒃ, ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᖅᓱᐊᓗᐃᑦ ᐃᑯᐊᓪᓚᒃᑎᑕᐅᓂᐊᖅᑐᑦ, ᐊᒻᒪᓗ ᐊᕐᔭᐃᑦ.

ᒪᓕᖕᓂᕐᒥᒃ ᖃᐅᔨᑎᑦᑎᓂᐊᕐᓗᑎᒃ ᖃᓄᐃᓕᐅᕐᓂᕐᒧᑦ ᑭᒡᓕᐅᔪᓄᑦ, ᐊᕐᕿᒍᑕᓖᒃᑯᑦ ᐃᑯᐊᓪᓚᒃᑎᑦᑎᖕᕕᖕᒥᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐅᓂᑉᑳᓕᐅᕐᓂᐊᖅᑐᑦ ᑐᓂᔭᐅᓗᓂᓗ ᐃᓚᒋᔭᐅᓗᓂ ᐊᕐᕿᒍᑕᓖᒃᑯᑦ ᐅᓂᑉᑳᓕᐅᓇᓂᕐᒧᑦ ᐱᔪᖕᓇᖅᑎᑦᑎᓂᖃᖅᑐᑦ ᐱᔾᔪᔾᔨᔨᓄᑦ. ᖃᑉᓯᐅᓂᖕᒋᑦ ᐊᒻᒪᓗ ᖃᓄᐃᑦᑑᓂᖕᒋᑦ ᐃᑯᐊᓪᓚᒃᑕᐅᔪᑦ ᐅᔭᖃᒃᑕᕆᐊᕐᒥᑦ ᐊᐅᓛᖅᑎᑦᑎᓂᖃᖅᑎᓪᓗᒋᑦ, ᐊᑕᐅᑦᑎᒃᑯᑦ ᖃᓄᐃᖕᒐᓂᐅᔪᑦ ᖃᑯᑎᒃᑯᑦ ᑐᖅᓱᐊᕐᒥᑦ ᐊᓂᐊᔪᓂᑦ ᐊᒻᒪᓗ ᐊᕐᔭᓂᒃ ᖃᐅᔨᓴᐃᓂᕐᓂᑦ, ᐃᓚᐅᓂᐊᖅᑐᑦ ᐊᕐᕿᒍᑕᓖᖅ ᐅᓂᑉᑳᒥᑦ. ᐅᓂᑉᑳᖅ ᑐᓂᔭᐅᓂᐊᕐᒥᔪᖅ, ᐱᔭᓇᐊᕐᑲᖅᐸᑦ, ᑲᓇᑕᒥᑦ ᐱᐅᖕᒋᑦᑐᓂᒃ ᓴᑉᑯᐃᓂᕐᓂᒃ ᓈᓴᐃᔨᓄᑦ. ᑭᖑᓪᓕᖅᐹᖅ, ᐊᓪᓅᑯᒃᑯᑦ ᐅᓂᑉᑳᓕᐅᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᐱᐅᖕᒋᑦᑐᓂᒃ ᐊᓂᐊᔪᑦ ᒥᒃᓵᓄᑦ ᐃᑲᔪᕐᓗᑎᒃ ᑲᓇᑕᐅᑉ ᓈᓴᐃᓂᖕᒋᓐᓄᑦ ᑎᑎᕋᖅᓯᒪᔪᖕᒐᓐᓂᑦ.

AGNICO EAGLE

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (Meliadine Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The approved project currently operates open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine. The Meliadine Extension proposes the operation of several other pits and underground mines to extend the life of mine until 2043.

This document presents the Incineration and Composter Waste Management Plan for the Meliadine Mine. This Plan was prepared in accordance with best management practices, Environment and Climate Change Canada's *Technical Document for Batch Waste Incineration,* and guidelines issued by the Nunavut Impact Review Board for the Meliadine Mine.

Solid waste incinerators and waste oil burners are regulated in Nunavut under the *Nunavut Public Health Act*, the *Nunavut Environmental Protection Act,* and the federal *Environmental Protection Act*. Performance limits for the incinerator at the Meliadine Mine is in accordance with the emission guidelines set out by the Canadian Council of Ministers of the Environment. Ash produced from the incineration process is disposed of in accordance with the *Nunavut Environmental Guideline for Industrial Waste Discharges*.

The Meliadine Mine is operating its incinerator based on Environment and Climate Change Canada's *Technical Document for Batch Waste Incineration*. In addition to incinerator technology, the implementation of a waste segregation program is limiting emissions (e.g., dioxins and furans, mercury) from the incinerator.

A typical modern controlled-air, batch, dual chamber incinerator has been installed model - ECO 1.75TN 1PVC100L 16-1MS. Critical process parameters, such as temperature, combustion air flow, and burner are computer-controlled to maintain optimal combustion conditions. The incinerator capacity is approximately 1,500 kilograms per day to accommodate predicted volumes of waste to be generated at the site. It is located in the waste management building[2] and operated by appropriately trained personnel.

Monitoring and testing is planned for incinerator stack emissions, along with the waste oil/fuel to be burned in the incinerator, and the incinerator ash.

To demonstrate conformity with performance limits, an annual incineration management report will be prepared and submitted as part of annual reporting to authorizing agencies. The quantity and type of materials incinerated on-site during operation, together with results from periodic stack emission

[2] Also known as the incinerator building.

and ash monitoring, will be included in the annual report. A report will also be provided, if necessary, to the National Pollutant Release Inventory. Finally, Agnico Eagle is committed to reporting greenhouse gas emissions in support of Canada's Voluntary Challenge Registry.

TABLE OF CONTENTS

TABLES

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	October 2012			First draft of the Incineration Management Plan	John Witteman, Env. Consultant, Agnico Eagle
2	March 2013			DEIS re-submission; rebranding	
3	April 2014	7.4.2	15	Revision made to address review comments and commitments	John Witteman, Env. Consultant, Agnico Eagle
4	April 2015			First version of Supporting Documents for Type A Water Licence Application, submitted to Nunavut Water Board for review	John Witteman, Env. Consultant, Agnico Eagle
5	February 2018			Reviewed internally	Agnico Eagle Environment Dept.
6	February 2019			Reviewed internally (added changes that the construction phase brought and review of the grammatical tense)	Agnico Eagle Environment Dept.
7_NIRB	November 2021			Updated to address Meliadine Extension application submission to NIRB for review and approval	Permitting Department

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
CCME	Canadian Council of Ministers of the Environment
CEPA	Canadian Environmental Protection Act
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CWS	Canada-Wide Standards
ECCC	Environment and Climate Change Canada
GN	Government of Nunavut
IMP	Incineration Management Plan
Mine	Meliadine Gold Mine

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (the Mine), located approximately 25 kilometres (km) north of Rankin Inlet, Nunavut, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut.

The approved mine plan includes one underground mine (Tiriganiaq Underground Mine) and two open pits (Tiriganiaq Open Pit 1 and Tiriganiaq Open Pit 2) for the development of the Tiriganiaq gold deposit. Several other pits and underground mining operations are planned to extend the life of mine until 2043.

Mining facilities on surface includes a plant site and accommodation buildings; ore stockpiles; a tailings storage facility (TSF); waste rock storage facilities (WRSFs); a water management system that includes collection ponds, water diversion channels, and retention dikes/berms; a series of water treatments plants and a waterline.

The purpose of the Plan is to provide consolidated information on the specifications, operations, management, monitoring, and reporting of the incinerator process for the Meliadine Mine. This Plan will be reviewed and updated on a regular basis to reflect changes to the Mine.

1.1 Concordance

This Plan has been developed to be consistent with the guidance provided in the Environment and Climate Change Canada's (ECCC) Technical Document for Batch Waste Incineration (EC, 2010).

1.2 Linkages to Other Management Plans

Documents which support this Plan include the:

- Landfill and Waste Management Plan;
- Hazardous Materials Management Plan;
- Interim Closure and Reclamation Plan; and
- Occupational Health and Safety Plan.

The Incineration and Composter Waste Management Plan is part of the Environmental Management and Protection Plan, which provides overarching environmental direction for the Mine.

1.3 Objectives

At the Mine site, all wastes are safely managed from the time they are produced to their final disposal. All waste are segregated at the mine site and are predominately landfilled, incinerated, composted, or recycled. Used oil burning will be maximized as much as possible using the second chamber of the incinerator. Remaining wastes, including hazardous waste[3], are packaged for shipment to a certified waste management facility for treatment, recycling, and/or disposal.

Incineration is an essential part of waste management at the mine site. The incineration of acceptable solid waste from the accommodation complex, kitchen, lunch rooms, shops, warehouses, and offices diverts waste from directly reporting to the on-site landfill. It has the advantage of eliminating putrescible waste that could potentially attract wildlife to the landfill, thereby reducing possible dangerous interactions between humans and wildlife.

Composting the material will also provide an environmental benefit by reducing the amount of material being incinerated. The type of material that will be diverted from the incinerator to the composter coincidentally also has higher water content and takes longer to incinerate which will help to further reduce greenhouse gas emissions at the Meliadine Mine site.

The objectives of this Plan are summarized as follows:

1) To understand the quantity and composition of the waste generated at the mine site, and separate waste acceptable for incineration from waste that is not;
2) To operate the batch waste incinerator based on the characteristics and quantity of waste, and to locate it in an appropriate building away from other site infrastructure;
3) To properly maintain the incinerator’s functionality;
4) To operate the incinerator for optimal combustion, and avoid the formation of dioxins and furans in the combustion process;
5) To safely handle and dispose of incinerator residues; and
6) To establish a record keeping system for managing the facility and for future reporting.

As a component of the Project Environmental Management System, the Plan will be updated to ensure that site experience is reflected in the Plan and subsequently communicated to all parties. The Environment Superintendent or designate is responsible for managing and implementing the Plan.

1.4 Incinerator and Composter Location

The incinerator and composter are located in its own building on the south end of the industrial pad, down-wind of other mine infrastructure. The UTM coordinates of the incinerator are 539392E; 6989833N. As part of Meliadine Extension, a second incinerator with less capacity will be added for use when maintenance is being completed on the main incinerator.

[3] Please refer to the Hazardous Materials Management Plan for further information on the handling and management of hazardous waste.

SECTION 2 • REGULATORY SETTING

2.1 Incinerator

Solid waste incinerators and waste oil burners are regulated in Nunavut under the *Nunavut Public Health Act*, the *Nunavut Environmental Protection Act,* and the federal *Environmental Protection Act*. Various regulations and guidelines under these Acts, as well as guidelines developed by the Canada Council of Ministers of the Environment (CCME), were reviewed in preparing the Plan. They are as follows:

- *Canadian Environmental Protection Act* (CEPA)
    - Schedule 1: List of Toxic Substances
    - *Interprovincial Movement of Hazardous Waste Regulations*
    - *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*
- ECCC Technical Document for Batch Waste Incineration (EC, 2010)
- Canada-Wide Standard for Dioxins and Furans (CCME, 2001a)
- Canada-Wide Standard for Mercury (CCME, 2000)
- Northwest Territories *Environmental Protection Act*
    - *Used Oil and Waste Fuel Management Regulations*
- Nunavut *Environmental Protection Act*
    - Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities (GN, 2011b)
    - Environmental Guideline for the Burning and Incineration of Solid Waste (GN, 2012)
    - Environmental Guideline for Ambient Air Quality (GN, 2011)
    - Environmental Guideline for Mercury-Containing Products and Waste Mercury (GN, 2010)
- Nunavut *Public Health Act*

Provincial and/or territorial regulations that pertain to emissions from incinerators were not found for Nunavut or the Northwest Territories. Therefore, performance limits for the incinerator at the Mine will be in accordance with the emission guidelines set out by the CCME: Canada-Wide Standard for Dioxins and Furans (CCME, 2001a), and Canada-Wide Standards for Mercury Emissions (CCME 2000).

The management of used oil is regulated in the Northwest Territories through the *Used Oil and Waste Fuel Management Regulations* (NWT, 2012; Reg. 064-2003). In the absence of Nunavut guidelines/regulations pertaining to used oil and waste fuel, the Northwest Territories regulations will be followed for the Mine.

Ash produced from the incineration process will be disposed of in accordance with the Nunavut Environmental Guideline for Industrial Waste Discharges (GN, 2014).

2.2 Composter

In preparing this Plan, Agnico Eagle reviewed the following documents:

- *Nunavut Environmental Protection Act*
- ECCC Solid Waste Management for Northern and Remote Communities: Planning
- Technical Guidance Document (ECCC 2017)

Agnico Eagle initially plans to place the final compost product from the composting process into the on-site landfill but may explore other potential uses of the compost product in the future. In Nunavut, there are no regulations or guidelines specific to the quality or uses of compost product, however, guidelines for compost quality and categorization exist in other provinces and at the federal level. Should Agnico Eagle wish to employ compost for other potential uses, this management plan will be updated to incorporate relevant guidelines.

SECTION 3 • BACKGROUND INFORMATION

3.1 Dioxins and Furans

Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans, commonly known as dioxins and furans, are toxic, persistent, and bioaccumulative chemicals. Their presence in the environment results predominantly from human activity. The biggest source of dioxins and furans in Canada is the large-scale burning of municipal and medical waste. Other major sources include:

- the production of iron and steel;
- backyard burning of household waste, especially plastics;
- fuel burning, including diesel fuel and fuel for agricultural purposes and home heating;
- wood burning, especially if the wood has been chemically treated;
- electrical power generation; and
- tobacco smoke.

Due to their environmental persistence and ability to accumulate in biological tissues, dioxins and furans are slated for virtual elimination under the CEPA, the Environment Canada Toxic Substances Management Policy (EC, 2004) and the CCME *Policy Statement for the Management of Toxic Substances* (CCME, 1998).

3.2 Mercury

Mercury is a naturally occurring substance, which can be transformed through biological processes to methyl mercury, a persistent substance which bioaccumulates in the food chain and is particularly toxic to humans and wildlife. Mercury contamination originates from natural and anthropogenic sources, the latter including combustion of waste. Under a variety of regional, national, bi-national, and internal programs, treaties and agreements, mercury is being targeted for emissions reductions consistent with the CCME *Policy Statement for the Management of Toxic Substances* (CCME, 1998), which identifies that mercury shall be managed through its lifecycle to minimize release.

3.3 Used Oil and Waste Fuel

The following definitions are provided in the *Used Oil and Waste Fuel Management Regulations*.

Used Oil: Any oil, including lubrication oil, hydraulic fluids, metal working fluid, and insulating fluid, that is unsuitable for its intended purpose due to the presence of impurities or the loss of original properties, but does not include waste oil derived from animal or vegetable fat, a petroleum product spilled on land or water, or waste from a petroleum refining operation.

Waste Fuel: A flammable or combustible petroleum hydrocarbon, with or without additives, that is unsuitable for its intended purpose due to the presence of contaminants or the loss of original properties, and includes gasoline, diesel fuel, aviation fuel, kerosene, naphtha, and fuel oil, but does not include paint, solvent, or propane.

SECTION 4 • PERFORMANCE LIMITS

4.1 Incinerator Selection

The selected incinerator is based on Environment and Climate Change Canada's *Technical Document for Batch Waste Incineration*. The incinerator for the Mine is a camp waste incinerator (model no. ECO 1.75TN 1PVC100L 16-1MS) from Eco-Waste Solutions. The incinerator complies with the guidelines listed in Table 4-1, where the maximum emissions are expressed as a concentration in the exhaust gas exiting the facility's stack. The specifications of the incinerator are available in Appendix A. In addition to incinerator technology, the implementation of a waste segregation program limits emissions of dioxins and furans, and mercury from the incinerator.

Table 4-1 Emission Regulations for Solid Waste Incinerators

Emissions	Sector	Guideline (max)[(a)]	Units	Reference
Dioxins and Furans	Municipal Solid Waste[(b)]	80	pg I-TEQ/Rm^3	CCME 2001a
Dioxins and Furans	Sewage Sludge Incineration	80	pg I-TEQ/Rm^3	CCME 2001a
Mercury	Municipal Waste	20	µg/Rm^3	CCME 2000
Mercury	Sewage Sludge Incineration	70	µg/Rm^3	CCME 2000

[(a)] Stack concentrations are corrected for 11% oxygen.

[(b)] According to the Canada-Wide Standards (CWS), "municipal solid waste" includes any waste that might be disposed of in a non-secure landfill site if not incinerated (i.e., non-hazardous wastes regardless of origin), but does not include "clean" wood waste.

Compliance to these performance limits are confirmed with annual stack testing.

4.2 Used Oil and Waste Fuel

Agnico Eagle manages used oil and waste fuel according to the *Used Oil and Waste Fuel Management Regulations* (NWT, 2012) as presented in Table 4-2.

Table 4-2 Summary of Used Oil and Waste Fuel Regulations

Activity	Summary of Regulations
Registration	• Waste oil burner shall be registered with the Chief Environmental Protection Officer.
Disposal	• Used oil/waste fuel will not be disposed of directly into the environment.
Storage	• Used oil/waste fuel will be stored in specifically designed container for hydrocarbons to minimize the risk of spills; • Used oil/waste fuel containers will be periodically inspected for leaks or potential leaks; and • Used oil/waste fuel will be stored as per the Hazardous Materials Management Plan.

Sampling and Analysis	• A sample of one month's feedstock of used oil/waste fuel is required to be tested at least once a year;
	• Used oil/waste fuel will be tested for:
	  ◦ Flash point; and
	  ◦ Existence and amount of each impurity Listed in Table 4-3.

Burning	• Used oil/waste fuel will not be openly burned; • Used oil will not be burned in accommodation areas; • Used oil with a flash point of less than 37.7°C will not be burned or blended with another used oil/waste fuel; • Used oil that exceeds guidelines will not be burned; and • A 14-day notice will be given for the burning of waste fuel.

Records	• The following will be recorded in association with the incineration of used oil/waste fuel:
	  ◦ Volume of used oil/waste fuel generated;
	  ◦ Volume of used oil/waste fuel incinerated/consumed;
	  ◦ Name and address of person in charge, management or control of the used oil;
	  ◦ Location of production of used oil/waste fuel;
	  ◦ A summary of maintenance performed on used oil/waste fuel burners or processing equipment; and
	  ◦ Volume and nature of the products produced from the used oil.

Table 4-3 summarizes the maximum level of contaminants in used oil that can be incinerated as stipulated in the *Used Oil and Waste Fuel Management Regulations* (NWT, 2012). Under the regulations blending of used oil that exceeds one of more of the criteria listed in Table 4-3 is not allowed.

Table 4-3 Used Oil Impurity Limit

Impurity	Maximum Level Allowed in Used Oil (ppm)
Cadmium	2
Chromium	10
Lead	100
Total Organic Halogens (as Chlorine)	1,000
Polychlorinated Biphenyls	2

4.3 Incinerator Ash

Provided the materials that go into the incinerator are controlled to exclude all hazardous materials, the incinerator ash should be non-hazardous. Even small quantities of hazardous waste, such as batteries, should not be mixed with waste to be incinerated. The purpose of sampling ash is to determine its acceptability for disposal in the landfill, pursuant to the GN Environmental Guidelines for Industrial Discharge (GN, 2011b). No sampling frequency is specified in those guidelines. To ensure compliance with the Guideline parameters, ash will be sampled quarterly by Agnico Eagle. Should an exceedance be measured, an investigation will be undertaken to identify the cause and eliminate the source for this exceedance. Agnico-Eagle may increase the testing frequency of the ash following the exceedance. Ash with metals concentrations exceeding the GN Guidelines will be buried within the Tailings Storage Facility (TSF). If deemed necessary, the ash will be packaged in drums to be sent to a certified waste management facility for appropriate treatment, recycling, and/or disposal.

4.4 Composter

There are no Nunavut, federal, or other provincial performance limits related to the use of a composter or to quality of compost if disposed of in a landfill. However, internal key performance indicators, such as temperature and humidity, will be developed with the composter supplier to ensure it is operating as planned.

SECTION 5 • INCINERATOR AND COMPOSTER SPECIFICATIONS AND OPERATION

The Mine has selected a dual chamber, high-temperature incinerator as the primary incinerator. The technical specifications are included in Appendix A. The incinerator is housed inside a separate building with sufficient floor space to manage all Mine wastes in one convenient location.

5.1 Incinerator Specifications

Typical modern, controlled-air, batch, dual chamber incinerators are design using the principles of pyrolysis (starved-air burning condition) in the primary chamber and complete oxidation (high temperature, excess oxygen, and sufficient combustion time) in the secondary chamber. The incineration system is a two-stage process. In the first stage, waste is converted to gas in the primary chamber at approximately 650 to 850 degrees Celsius (°C). This process is self fueling until the volume is reduced by 90 %. Gasses from the primary chamber enter the secondary chamber of oxygen-rich and turbulent conditions, which is typically at a higher temperature – around 1,000°C. Combustion is complete after a retention time of about two seconds. The temperature of combustion gases exiting the stack is anticipated to exceed 700°C and to flash cool in the ambient air, thereby leaving little opportunity for the *de novo* synthesis of dioxins/furans. Heat capture is not used on the exhaust gases.

Critical process parameters, such as temperature, air flow, and burner output is computer-controlled to maintain optimal combustion conditions.

For an incinerator capacity suitable for the predicted volumes of waste to be generated at the Mine, the total particulate matter generated is expected to be extremely low. Therefore, dust collection technologies, such as baghouse filters, will not be necessary, as very minor amount of fly ash will be generated. Ash residues generated in the primary chamber are manually removed on a daily basis using a shovel emptied into a metal bin.

5.1.1 Operation Procedures

General operating procedures for the incinerator include:

1. Sort the waste on the basis of origin and heating value. Food waste and waste that has been in contact with food will have priority for incineration.
2. Mix the waste to ensure a calorific value within the incinerator’s specification and to achieve good combustion inside the primary chamber.
3. Observe the start of the burn cycle to ensure the incinerator is operating correctly.
4. The door to the incinerator is only opened after the burn cycle is complete and the unit cooled.
5. The ash is removed from the incinerator before it is charged with the next load of waste to be incinerated.
6. The ash is placed in bins digitated for ash.

7. The ash is disposed of in the on-site landfill. If the concentration of trace metals exceeds the Government of Nunavut's *Environmental Guideline for Industrial Waste Discharges* (GN, 2014), ash will be either packaged and sent to an approved disposal facility or buried in the dry stack tailings.

The system has a sizable front door for easy access to manually load/feed waste into the unit with a front-end loader. The proposed waste streams are layered wherever possible during loading to ensure proper combustion.

5.1.2 Emissions

The incinerator is designed to meet performance limits described in Section 4.1. Good engineering practices will be used to ensure required incineration temperatures and dispersion of gases meet applicable air quality standards/guidelines.

The incinerator stack design incorporates appropriate sampling ports, with caps where necessary, at appropriate locations to allow for stack testing to be undertaken during incinerator operation.

5.1.3 Dust/Odour Control Measures

Modern incinerators are commonly designed such that the non-turbulent atmosphere in the primary burn chamber reduces the formation of particulate matter. Therefore, the need for additional dust and/or odour control measures is not anticipated. Organic/putrescible wastes will be given incineration priority to limit odours.

5.1.4 Staffing and Equipment

The computerized incinerator typically requires one operator to interact with the equipment for approximately 1 to 1.5 hour per day, largely for ash removal, loading, and start-up. Operators are not typically required to be in attendance during the rest of the operation, as it is normally a fully automated process. The incinerator is designed, installed and operated so that the operators are not exposed to high temperatures during loading or ash removal due to complete cool down after the burn cycle. Also, the waste is not allowed to combust until the chamber is sealed thus isolating the worker from smoke and high temperatures.

5.1.5 Inspections

Weekly inspections will be undertaken of the incinerator building for cleanliness and the proper management of wastes delivered to the facility. The Environment Department will carry out the inspections.

5.2 Used Oil and Waste Fuel

The incinerator is able to efficiently burn used oil and waste fuel. A quantity of about 365,000 litres of used oil and waste fuel may be incinerated per year. The quantity of waste fuel is expected to be small and will be dependent on the adherence to standard operating procedures. The goal is to avoid practices that could result in waste fuel. The principal sources of the used oil will be from oil changes on the mining equipment and light vehicles, as well as oil changes to mechanical gearboxes within the mill. Typical used oil and waste fuel furnaces include a storage tank and a filter to recover sludge prior to burning. Sludge collected in the filters will be drummed and shipped, as needed, to a certified waste management facility for treatment, recycling, and/or disposal.

5.3 Shipboard Incinerator

Refer to the Shipping Management Plan.

5.4 Composter

The Meliadine composter is proposed as the Brome series in-vessel composter which consists of an insulated cylinder that rotates according to pre-set timed intervals. The rotation of the cylinder allows the material inside of the chamber to mix while providing aeration.

Agnico Eagle will use experience with composting acquired from Meadowbank, and another northern Canada mine site (Ekati Diamond Mine) that started composting a few years ago using the same composter equipment supplier.

5.4.1 Operation Procedures

General operating procedures for the composter will include:

1. Collected compostable waste is stored in dedicated waste containers.
2. Waste collected in containers is inspected visually by the composter operator on sorting tables located at the composting facility to ensure it does not contain inappropriate types of waste materials. Materials that do not meet the criteria for composting will be incinerated, recycled, or disposed of as hazardous material.
3. The waste goes through an agricultural mixer used to break down and mix the material. The breakdown of materials increases the surface area to volume ratio and allows for increased aeration and biological activity within the composter.
4. Material is transferred to the composter where the composting process begins.
5. During the composting process, the operator reviews the temperature and humidity of the compost within the composting chamber to ensure targets, to be determined with supplier, are reached. The operator visually inspects the compost for foreign matter and check that the texture and consistency of the compost appears normal.
6. As the compost is discharged, it runs across a screen/sifter that removes any large material that may have been accidently introduced into the composter. The residual materials will be sorted into incinerator waste, recyclable material, landfill material, or hazardous goods that will be shipped off site. Larger organic material may be reintroduced into the mixer to begin the composting process again.
7. The solid decomposed material is discharged and stored in a bin.
8. The full bin of compost is transported to the landfill for disposal.

If the composting process does not break down the material effectively after the second cycle, or if the composter is temporarily out of service for any reason, the material will then be sent to the incinerator.

5.4.2 Odor Control Measures

Since the composter will be in an enclosed area, a ventilation shaft or a sanitary drain that exits the building for the elimination of composting gas and odours will be included in the building design. Odours during the operation of the equipment will be mitigated by sweeping the floor, cleaning up any organic matter debris on or around the composter, and removing any material that has fallen on the floor. Waste will also be cleaned up in the loading and unloading areas. Loads of organic matter arriving at the composting building will be promptly mixed and added to the composter.

For the operation of the incinerator, waste is stored prior to incineration. With the diversion of the organic waste to the composter, the waste will no longer need to be stored and instead will be introduced promptly into the composting process. This will help to reduce potential odours associated with the material management prior to processing.

Careful monitoring of the composting process using appropriate carbon to nitrogen ratios as discussed with the supplier as well as using regular log book entries and adherence to the procedures and recipes will aid in avoiding the generation of odours. The monitoring of humidity is an important factor in controlling odours from the composting process. Composting often proceeds well at a moisture content of 40-60% by weight. At lower moisture levels, microbial activity is limited. At higher levels, the process is likely to become anaerobic and foul-smelling.

The Environment Department will monitor the landfill where possible to ensure that wildlife does not become attracted to the compost material being added to the waste.

5.4.3 Introduction of invasive species

Composting will be monitored and controlled. Aerobic conditions will be maintained and includes a high-temperature phase for a specified amount of time (e.g., above 55 ˚C) that reduces or eliminates pathogens and weed seeds. Adherence to the composting instructions will avoid concerns over introduction of invasive species to the landfill.

5.4.4 Operator Training

Personnel operating or performing maintenance on the composter will be trained by a Brome Composter representative. The training will include a composting theory portion and a practical, hands-on portion.

5.4.5 Inspections

Inspection criteria and work instruction checklists will be developed with assistance from the composter supplier to ensure proper operation of the equipment. Routine inspections of the composter and associated facilities will be conducted by a competent, trained operator prior to every use.

5.5 Closure Plan

In accordance with the Interim Closure and Reclamation Plan, salvageable buildings and surface structures, including the incinerator and waste management building, will be dismantled and demobilized from the site.

SECTION 6 • WASTE MANAGEMENT

One method of waste reduction is by implementing purchasing policies that focus on reduced packaging. Reduce, reuse, and recycle initiatives as well as the waste segregation program at the Mine as per the Landfill and Waste Management Plan minimizes the quantity of waste incinerated or directed to the landfill.

6.1 Approach

A waste segregation program is implemented at the site. This allows materials that are unsuitable for incineration to be either landfilled on-site or shipped off-site to a certified waste management facility for treatment, recycling, and/or disposal.

6.2 Acceptable Waste for Incineration

Acceptable wastes for incineration will include the following:

- organic matter including food;
- food containers and wrappings, including plastics that are contaminated by food;
- medical waste from the Health Care Station;
- paper, cardboard, and the like;
- hydrocarbon spill absorbents;
- plastic and Styrofoam except plastic containing chlorine;
- dead animals; and
- used oils and waste fuel.

6.3 Acceptable Waste for Composting

Acceptable wastes for composting will include the following:

- organic matter including food (e.g., coffee grounds and tea bags, eggs and egg shells, fruit and vegetable peelings, meat, chicken and fish including bones, nut shells, pasta, rice, sauces and gravy, solid dairy products, table scraps and plate scraping etc. as well as leaf and yard organic material including brush and tree trimmings);
- paper and cardboard; and
- dead animals (small size only).

6.4 Unacceptable Waste for Incineration

Materials that are not listed above would be unacceptable for incineration. These materials include, but are not limited to:

- chlorinated plastics;
- inert materials, such as concrete, bricks, ceramics, ash, asbestos, drywall;

- bulky materials such as machinery parts or large metal goods such as appliances;
- radioactive materials, such as smoke detectors and laboratory wastes;
- potentially explosive materials, such as propane tanks, other pressurized vessels, unused or ineffective explosives;
- hazardous materials such as organic chemicals (pesticides), other toxic substances (arsenic, cyanide);
- electronics;
- batteries;
- vehicles and machinery;
- fluorescent light bulbs;
- whole tires;
- paint and solvents;
- any materials containing mercury, lead, and cadmium;
- used oil or waste fuel that exceeds the maximum impurity limits for parameters listed in Table 4-3;
- waste oil and waste fuel with a flash point of less than 37.7°C; and
- propane.

6.5 Waste Volumes

6.5.1 Solid Waste and Incinerator Ash

The number of people working on-site and the activities occurring at the time have a direct bearing on the volume of waste destined for the landfill, the incinerator, and the amount removed from waste streams for reuse and recycling.

It has been assumed that each person will produce 1 tonne of refuse per year[4]. Mean camp populations of approximately 680 during operation, and 100 during closure have been estimated. Fifty percent of the refuse by weight can be incinerated, approximately 30% of incinerated material by mass is converted into ash, thereby reducing the mass of waste by approximately 70 %. Table 6-1 estimates the annual tonnes of ash resulting from incineration for each project phase, based on the number of people on site, and cumulatively over the life of mine.

[4] Environment and Climate Change Canada's "State of the Environment InfoBase", Environmental Indicator Series 2003 (http://www.ec.gc.ca), indicates that the per capita non-hazardous solid waste generation in 2000 for Canada was almost 1 tonne per person per year.

Table 6-1 Estimation of Ash over the Life of the Mine

Phase	Workers On-Site	Annual Tonnes of Waste Incinerated	Annual Tonnes of Ash	Numbers of Years	Cumulative Tonnes of Ash
Operation	680	340	102	8	816
Closure	100	50	15	7	105
Total					**921**

6.5.2 Used Oil and Waste Fuel

Approximately 365,000 litres of used oil is anticipated to be used in the incinerator for burning the waste. This is based on the maximum capacity of the incinerator burn rate which is approximately 1000 litres/day. The quantity of waste fuel is expected to be small but may vary between years.

6.6 Waste Incineration Rate

Due to the predicted volumes of waste to be generated at the site, the incinerator will have an approximate incineration capacity of 1,750 kilogram per day. If this cannot be achieved due to a lower volume of waste, the primary chamber could be used as storage of wastes until the desired volume is reached. These wastes will primarily associated with food and small amount of medical waste. The batch cycle will be 6 to 10 hours for the burn cycle, followed by a cool-down of 6 to 8 hours.

SECTION 7 • MONITORING AND TESTING

The following presents the monitoring and testing plan for the incinerator.

7.1 Incinerator Emissions Testing

The incinerator stack design incorporates appropriate sampling ports at appropriate locations, in a right angle configuration, to allow for stack testing to be undertaken during incinerator operation. Table 7-1 summarizes the frequency of testing that will be completed as per relevant guidelines (see also CCME, 2001b). Details of the monitoring program are outlined in Appendix B.

Table 7-1 Summary of Incinerator Emissions Testing

	Frequency	Number of Test Required	Reference
Dioxins and Furans	Annual	3	CCME 2001a
Mercury	Annual	3	CCME 2000

7.2 Used Oil/Waste Fuel Testing

A sample of used oil/waste fuel feedstock will be collected each month with one of the monthly samples being tested each year. Used oil/waste fuel not meeting impurity limits or having a flash point less than 37.7°C will be drummed and shipped to a certified management facility for re-refining, treatment, recycling, and/or disposal.

7.3 Ash Testing

An ash testing protocol is implemented on site to ensure that the incinerator ash is suitable for disposal in the landfill. Ash is disposed of and then covered immediately to prevent mobilization.

Ash samples are collected and tested quarterly and compared to the regulatory requirements as outlined in Table 7-2.

If monitoring indicates the ash is above the guidelines and not suitable for landfilling, an investigation will be undertaken to identify the cause and eliminate the source for the exceedance. If deemed necessary, the ash will be packaged in drums and sent to a certified waste management facility for treatment, recycling, and/or disposal.

Table 7-2 Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities

Parameter	Maximum Concentration (mg/L)
Arsenic	2.5
Barium	100
Cadmium	0.5
Chromium	5
Lead	5
Mercury	0.1
Selenium	1
Silver	5
Zinc	5

7.4 Compost

The compost output will be visually inspected each time it exits the sieve. Should Agnico Eagle decide to explore other options for potential uses of compost, further analytical testing will be undertaken as detailed in relevant compost quality guidelines.

SECTION 8 • REPORTING

As part of the annual reporting, results from periodic stack emissions and ash monitoring, will be provided.

8.1 National Pollutant Release Inventory

The National Pollutant Release Inventory is a Canadian database containing information on the annual on-site release of specific substances to the air, water, and land from industrial and institutional sources (EC, 2012). The National Pollutant Release Inventory provides a list of tracked substances and requirements for reporting incinerator emissions. Table 8-1 lists the substances under the National Pollutant Release Inventory that the Mine expects to report annually. In addition, there are certain substances, as indicated in Table 8-1 that may require reporting depending on the quantity of incinerator emissions. Whether or not reporting is necessary will depend on results of periodic stack emission testing data and the quantity of annual emission calculated with emissions factors.

Table 8-1 National Pollutant Release Inventory Incineration Reportable Substance List

Substance	Note
Hexachlorobenzene	Required to report
Dioxins and Furans	
Carbon Monoxide	Required to report if released to air from facility in a quantity of 20 tonnes or more per annum
Oxides of Nitrogen	
Sulphur Dioxide	
Total Particulate Matter with diameter <100 microns	
Particulate matter with diameter less than or equal to 10 microns (PM_{10})	Required to report if released to air from facility in a quantity of 0.5 tonne or more per annum
Particulate matter with diameter less than or equal to 2.5 microns ($PM_{2.5}$)	Required to report if released to air from facility in a quantity of 0.3 tonne or more per annum

8.2 Greenhouse Gas Emissions and Global Warming

Agnico Eagle is committed to reporting greenhouse gas emissions in support of Canada's Greenhouse Gas Reporting Program.

SECTION 9 • PLAN REVIEW AND ADAPTIVE MANAGEMENT

The Plan is updated regularly to reflect the operating conditions at the Mine during construction, operation, and closure. The Plan is reviewed annually and an updated version will be produced every two years of operation at a minimum.

The up-to-date Plan is made available by Agnico Eagle at all times for review by the Government of Nunavut, Kivalliq Inuit Association, Nunavut Water Board, and Crown-Indigenous Relations and Northern Affairs Canada.

Should Agnico Eagle determine the need to add additional composters to the on-site operation, the Plan will be reviewed and updated to reflect this change to the operation. Should Agnico Eagle wish to employ compost for other potential uses, this management plan will be updated to incorporate the above mentioned guidelines.

REFERENCES

CCME (Canadian Council of Ministers of the Environment). (1998). Policy Statement for the Management of Toxic Substances. Available on-line: http://www.ccme.ca/assets/pdf/toxics_policy_e.pdf

CCME. (2000). Canada-Wide Standards for Mercury.

CCME. (2001a). Canada-Wide Standards for Dioxins and Furans.

CCME. (2001b. Canada-Wide Standard for Waste Incineration – Stack Testing Requirements.

EC. (Environment Canada). 2004. Toxic Substances Management Policy (TSMP).

EC. (2010). Technical Document for Batch Waste Incineration.

EC. (2012). National Pollutant Release Inventory (NPRI).

GN (Government of Nunavut). (2010). Environmental Guideline for Mercury-Containing Products and Waste Mercury. Government of Nunavut, Department of Environment, Environmental Protection Service.

GN. (2011). Environmental Guideline for Ambient Air Quality.

GN. (2011b). Environmental Guidelines for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities.GN. (2012). Environmental Guideline for the Burning and Incineration of Solid Waste. Government of Nunavut, Department of Environment, Environmental Protection Service

GN. (2014). Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities. Government of Nunavut, Department of Environment, Environmental Protection Service.

Minister of Justice. (1999). CEPA (Canadian Environment Protection Act). Available on-line: http://laws-lois.justice.gc.ca/PDF/C-15.31.pdf

NWT. (2012). Used Oil and Waste Fuel Management Regulations, Department of Environment, Government of Nunavut.

APPENDIX A • TECHNICAL SPECIFICATIONS OF THE INCINERATOR

AGNICO EAGLE

Vendor Document Status

1 ☐	**Proceed to next submission and status.**
2 ☐	**Proceed with exceptions as noted to next submission and status.**
3 ☐	**Do not proceed.** **Revise as noted and resubmit next submission and status.**
4 ☑	**Complete, no further submission required.**

By: **Date:**

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle No. 6515-S-265-008-154-MNL-0002 **R:** Sub002

DOCUMENT FOR INFORMATION

Bolts and torques for breech and stack installation pg.33 & pg.35
Capacity typo corrected pg.47
Table of content added
Parts list added pg.123-128
Stack erection revised pg.35&36

Meliadine Incinerator
ECO 1.75TN 1PVC100L
16-1MS

CORPORATE OFFICE

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Table of Contents

SECTION 1

HEALTH & SAFETY PRECAUTIONS

Health and Safety Precautions

This machine has a number of energy sources:

e.g. Electricity
Heavy mechanical parts which may move due to gravity
High Temperature
Explosive Gases
Flammable Liquids

- **THE INCINERATOR HAS THE POWER TO CAUSE SERIOUS INJURY OR DEATH**
- **KEEP CLEAR OF ANY MOVING PARTS AT ALL TIMES**
- **BEFORE STARTING THE CYCLE ENSURE THAT ALL PERSONNEL ARE CLEAR OF THE INCINERATOR**
- **DO NOT ATTEMPT TO START OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL IS READ THOROUGHLY AND IS UNDERSTOOD**.
- **RESPONSIBILITY FOR THE SAFE OPERATION AND MAINTENANCE OF THE EQUIPMENT SUPPLIED RESTS SOLELY ON THOSE OPERATING IT.**

OBEY THE FOLLOWING SAFETY INSTRUCTIONS:

A qualified person is a person whom the owner of the equipment deems as having the required experience, training and skills to perform the required work.

1. Keep the electrical panel doors closed at all times except when doing electrical trouble-shooting.

2. Allow only qualified people to perform maintenance and troubleshooting on the machine.

3. Open and lockout the Main Disconnect Switch on the electrical control panel while working on the machine.

4. Do not bypass or tie down any of the door safety switches.

5. Do not open any of the doors while the Primary or Secondary Chambers are above 90^0C

6. Do not enter the chamber unless the Emergency Stop Button is pushed in

7. When opening or closing the chamber door keep clear of the door and ensure that the path for the door is clear.

8. Secure the chamber door when it is open so it cannot move accidentally.

9. Immediately correct any fuel leaks.

10. Do not fill the Primary Chamber more than ¾ full. Overfilling can result in poor burning and damage to the oxidizer.

11. Use proper tools, wear goggles, dust mask and gloves while loading and cleaning the oxidizer.

12. This unit is a confined space. Follow the safety rules for working in a confined space.

13. Ensure that all personnel who are going to operate or work on the machine read and understand the above points and are trained in the operation and maintenance of the machine.

SECTION 2

GENERAL DESCRIPTION

General Description - Thermal Oxidation Concept

The **ECO 1.75 TN 1PVC100L Incinerator system** consists of a **Primary Chamber** and a **Secondary Chamber** (also known as the Afterburner). Both chambers are vessels constructed of steel with a special insulating liner known as refractory.

The **Primary Chamber** has **Hydraulic Roof Lifters** installed for loading of the waste material from the top of the **Primary Chamber** and the front door is used for the removal of residual ash.

The waste material is loaded into the **Primary Chamber** until it is ¾ full. Once ¾ full the **Primary Chamber** is sealed and the combustion cycle begins. This type of system is known as *batch-fed* processing.

Primary Chamber

In the first stage, a burner is used to elevate the temperature of the **Primary Chamber** to ignite the waste. Once the **Primary Chamber** reaches a temperature of approximately 650-850°C, the burn process becomes self-fuelling and the burner will shut off. To save fuel and control temperatures, only when the energy contained within the waste is depleted, will the burner periodically turn on. At these operating temperatures, waste is allowed to fully combust and is rendered sterile.

The **Primary Chamber** operates under *controlled temperature* conditions. The amount of heat released, from the burning of the waste, is controlled by limiting the air into the **Primary Chamber** to less than what is required to complete combustion. This is described as *starved air* conditions. With controlled air and temperature the waste is dried, heated and burned thereby releasing moisture and volatile components. The non-volatile, combustible portion of the waste is burned in the **Primary Chamber** to provide heat while the non-combustible portion accumulates as ash.

In the end, the waste volume is reduced by over 90%. Independent tests have shown that the residual ash is non-hazardous, non-leaching and essentially inert. After enduring the combustion process, metals and glass remain intact. Preservation of metals and glass not only protects the refractory lining from damage caused by melted and fused metals and glass, but also allows for post-combustion recycling where possible.

Remaining in the **Primary Chamber** are non-combustibles, such as metal and glass, and carbonaceous residue. The incoming air, subjecting the non-combustibles to high temperatures, further burns the carbonaceous residue. The result is an oxidized ash product.

Controlling the gas velocity through the system is an important factor in limiting pollution. The gases flowing from the **Primary Chamber** are a result of the interaction of the air with the waste during the controlled burning process. Both the quantity and velocity of the gas product vary according to chamber temperature conditions and the type of waste being burned. The integrated controls for the **Primary** and **Secondary Chamber** act to minimize peaking activity thus controlling pollution automatically.

The combustion gases released in the **Primary Chamber** then pass into the **Secondary Chamber** through a turbulent mixing zone where ignition takes place and additional combustion air is provided to complete the burning process.

Secondary Chamber

As waste burns in the **Primary Chamber**, gases containing the products of combustion enter the high temperature zone of the **Secondary Chamber** for cleansing. The **Secondary Chamber** is sized to retain the incoming gases for a minimum of 2 seconds at 1000°C. This chamber utilizes a high output, fully modulating dual fuel (diesel & waste oil) burner to maintain the required temperature (even in the absence of energy input from the first stage which is important when processing wet or low energy waste). This stage employs a large blower, tightly controlled by the control system using a variable frequency drive on the motor. The blower creates the turbulence required to mix the gases and oxygenate them. This fosters the high efficiency combustion required to break hydrocarbon chains into carbon dioxide and water vapour.

The **Secondary Chamber Blower** air is introduced into the **Secondary Chamber** by an air ring manifold that surrounds the **Secondary Chamber**. The manifold has small air jets called tweers that open into the **Secondary Chamber** at the side walls and create a powerful vortex of excess air to mix the incoming gases and ensure complete combustion. The flow of air is tightly managed by the control system using a Variable Frequency Drive (VFD) by controlling the speed of the fan and modulating motors on the blower inlet dampers.

The **Secondary Chamber Blower** is extremely important as it creates the turbulence required to mix the gases and oxygenate them. This fosters the high efficiency combustion required to break hydrocarbon chains into carbon dioxide and water vapour. It also acts to cool the **Primary Chamber** and prevent temperature overruns.

The **Secondary Chamber** burner is a high output burner and its output is self modulated over a broad range for very precise temperature control.

The **Secondary Chamber** is sized to allow two seconds of retention time. This is the time that the gases from the **Primary Chamber** are retained in the **Secondary Chamber** before they exit to the next stage. Two seconds of retention is considered to be ideal to destroy any harmful organic hydrocarbons produced from the **Primary Chamber**.

Main Control Panel

There is one **Main Control Panel** that controls all of the interconnecting modules. The Operator has one simple **Human Machine Interface (HMI)** to start the equipment, view system status and change control settings if required. The system utilizes a PLC (programmable logic controller) to automate its functions. All critical process parameters such as temperature, combustion airflow and burner output are operated using EWS' patented system control program to maintain optimal combustion and air pollution abatement.

Protecting the Environment

Why Incinerate?

As society becomes more environmentally conscious, environmental regulations on the proper disposal of solid waste have become more stringent. As a result, incineration has become an environmentally responsible and socially acceptable alternative for handling waste at the point of need. However, incineration does not eliminate the need to landfill waste but it does reduce the amount of waste that must be placed in landfills.

Primary advantages of incineration are:

- It greatly reduces the weight and volume of waste material that must be disposed of in landfills
- It destroys organic materials that may be harmful or that may be degradable to harmful materials in landfills
- The incinerator sterilizes the waste; that is, the high temperatures in incinerators can destroy any pathogens that may be in infectious waste materials
- The incinerator destroys animal or human pathological wastes that the general public finds objectionable to handle or see.

Environmental Concerns

The general public will not accept incineration as an option for treating waste of any kind, if they do not believe that it is safe environmentally. The primary concerns are about air pollutants produced by the incinerator and the toxicity of the residual ash. This section will present some of the terminology that is important to understanding these concerns. The remainder of the manual will describe how an incineration system can be operated and maintained in a way that keeps environmental releases at an acceptable level.

Air Pollutants of Concern

<u>Particulate matter</u> may be defined as fine liquid or solid matter such as dust, smoke, mist, or fumes found in the gaseous emissions from the incinerator. Particulate matter emissions may have a dark or light color. Particulate matter emissions can be described in terms of opacity. Opacity is the degree to which light is obscured by a polluted gas (a clear window has 0 percent opacity while black paper has 100 percent opacity). Opacity may be measured with the naked eye or using an opacity monitor. Particulate matter is a problem because it can cause or aggravate respiratory problems in humans. It also creates aesthetic problems since it is readily noticed and is a nuisance because of soiling of exposed surfaces on houses and cars.

<u>Hydrochloric (HCl) acid</u> is generated when polyvinyl chloride (PVC) plastic (usually clear plastic) material is burned in the incinerator. The appearance of a white plume or cloud a short distance above the stack indicates that HCl is condensing. The major concerns about HCl are that it causes respiratory problems in humans, contributes to acid rain problems, and causes material damage to metals and concrete.

<u>Toxic metals</u> include cadmium, arsenic, beryllium, chromium, nickel, lead, and mercury. These metals may be found in municipal wastes. These metals are known to be hazardous to human health.

Organic compounds are compounds that contain primarily carbon and hydrogen and may also contain other elements such as oxygen, nitrogen, and chlorine in smaller amounts. Some organic compounds are known to cause or are suspected of causing cancer and are considered hazardous air pollutants. The public's primary concern is related to dioxin and furan emissions, but other organic compounds such as benzene and vinyl chloride may be emitted.

Carbon Monoxide (CO) also is generated during combustion if the combustor is not operated properly. (Your automobile generates some amount of CO.) CO is toxic to humans if concentrations are high enough, and it also is an indicator of combustion quality.

Solid Waste Ash Quality

One of the major objectives of incineration is to generate a high quality ash for land disposal. All pathogens should be destroyed, and almost all organic material should be completely burned. Ideally, no large chunks of unburned waste material (other than metals or glass) should remain in the waste. A measure of ash quality is "burnout," which is the percentage of organic material remaining in the waste. For example, a burnout of 95 percent means that the ash can contain only 5 percent organics. Adequately burned and quenched ash may be disposed of in a sanitary (municipal) landfill. The ash should be stored in covered containers or kept wet prior to transport to the landfill to prevent 'fugitive \ emissions.' Individual landfills may have requirements that must be followed in order for your waste to be accepted. You should familiarize yourself with these requirements to prevent refusal of the waste.

The Operator – Your Role

It is the operator's role and responsibility to protect the environment by:

1 Complying with all emission limits and operating practices specified in the permit to operate.
2 Minimizing emissions of particulate matter, HCl, toxic metals, carbon monoxide, and organic compounds through proper incineration;
3 Operating the incinerator to generate high quality ash that is sterile and can be disposed of in landfills;
4 Minimizing particulate matter emissions from ash handling;
5 Disposing of ash properly by sending it to appropriate disposal sites; and
6 Performing the regular maintenance inspections to catch any operational problems early.

Basic Combustion Principles

The Combustion Process

Combustion of Municipal Solid Waste (MSW) is a chemical reaction. In the incinerator, organic materials and oxygen react rapidly and violently to produce combustion gases and energy in the form of heat and light.

$$\text{Organic Solid Material} + \text{Oxygen} \xrightarrow[\text{Heat}]{} \text{Combustion Gas} + \text{Solid Residue} + \text{Energy(Heat)}$$

For the reaction to begin and to keep going, all three elements - organic material, oxygen, and heat-must be present. The organic material used in the reaction comes from two sources, waste and auxiliary fuel. Some organic material is contained in most solid waste types. Depending on the fraction of organics and the specific organic composition, the waste may be adequate to sustain combustion. Auxiliary fuel may be used to maintain combustion if the waste material does not contain enough organic material to maintain high temperatures. The combustion reaction between the organic material and oxygen that causes the organics to burn will occur only after the temperature of the organic material is raised to the point that combustion can begin.

Energy in the form of heat is required to raise the temperatures of the incinerator chamber and organic material and O_2. This energy usually is supplied by the auxiliary fuel burners.

Rate of Combustion Air

The oxygen needed for the combustion reaction is supplied by the ambient combustion air. Combustion air is supplied to the combustion chambers through air ports by natural draft. In general, this air contains about 21 percent oxygen (O_2) and 79 percent nitrogen (N_2), so about 21 percent of the total combustion air fed to the incinerator is oxygen that is available to react with the organic material in the waste and fuel. The nitrogen passes through the chamber mostly unreacted; some nitrogen oxides are formed.

Oxygen Reaction

Solid waste contains two types of organic materials

1. Volatile Matter
2. Fixed Carbon

These two types of materials are involved in distinct types of combustion reactions, and the operating variables that control the two types of reaction are different.

Volatile matter is that portion of the waste that is vaporized (or evaporated) when the waste is heated. Combustion occurs after the material becomes a gas. The combustion variables that influence this reaction are gas temperature, residence time, and mixing.

- A minimum temperature is needed to start and sustain the chemical reaction.
- Residence time is the length of time, generally measured in seconds that the combustion gas spends in the high temperature combustion chamber. The residence time must be long enough for the reaction to be completed before it leaves the high temperature zone.
- Turbulent mixing of the volatile matter and combustion air is required to ensure that the organic material and oxygen are well mixed.

Fixed carbon is the nonvolatile organic portion of the waste. The combustion reaction is a solid-phase reaction that occurs primarily in the waste bed (although some materials may burn in suspension). Key operating parameters are bed temperature, solids retention time, and mechanical turbulence in the bed.

- The solids retention time is the length of time that the waste bed remains in the Primary Chamber.
- Mechanical turbulence of the bed is needed to expose all the solid waste to oxygen for complete burnout. Without mechanical turbulence, the ash formed during combustion can cover the unburned waste and prevent the oxygen necessary for combustion from contacting the waste.

Products of complete combustion are:

- Carbon dioxide
- Water

One example of volatile waste is backyard charcoal grill with starting fluid. The starting fluid is highly volatile. When put on the charcoal and ignited with a match, it rapidly volatilizes and burns. The charcoal contains less volatile matter and primarily burns slowly as a fixed carbon bed.

Operating Factors Related to Combustion

The three operating factors that have the greatest effects on the combustion reaction are:

- Combustion airflow rate and distribution,
- Operating temperatures, and
- Waste feed rate and characteristics.

These three factors are all related. Controlling them controls the combustion reaction.

Stoichiometric Air

In the chemical reaction between organic materials and oxygen, the amount of oxygen required under ideal or "perfect" conditions to burn all of the organic materials with no oxygen left over is called the stoichiometric (or theoretical) oxygen level. The amount of combustion air associated with that oxygen level is called the stoichiometric air level. At stoichiometric air level the combustion gas would contain no oxygen because it would all be used in the combustion reaction.

Substoichiometric Air

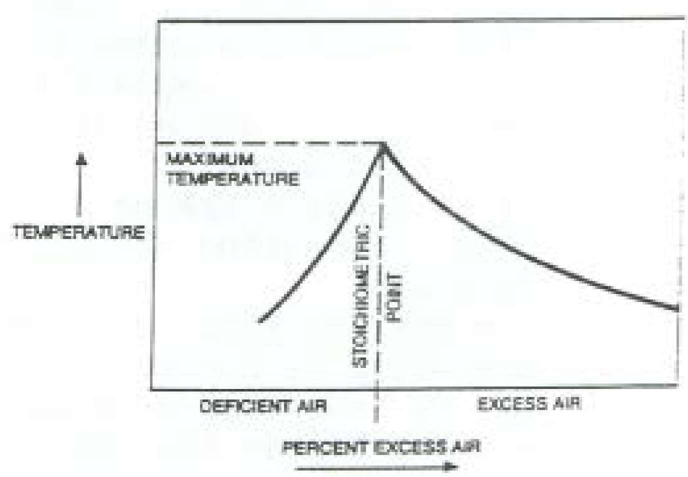
Airflows less than those required at stoichiometric levels are called deficient air or substoichiometric starved-air levels. Under starved-air conditions, the combustion gas would again contain no oxygen, but organics also would remain because combustion is not complete.

Excess Air

Air flows greater than those required at stoichiometric levels are called excess-air levels. Typically an incinerator operates with an overall 140 to 200 percent excess air level. That is, the incinerator operates with one and one-half to two times more air than required at stoichiometric levels. Excess air is used to assure that enough oxygen is available for complete combustion.

Control of Temperature as a Function of Air Level

Maximum combustion temperatures are always attained at stoichiometric conditions. As the amount of excess air is increased above the stoichiometric point, the temperature in the incinerator drops because energy is used to heat the combustion air. If the amount of combustion air is too great, the temperature drops below “good combustion temperature," and undesirable combustion products are generated as a result of incomplete combustion. As the amount of excess air is decreased, the combustion temperature increases until it becomes maximum at the stoichiometric point. Below the stoichiometric point, the temperature decreases because complete combustion has not occurred.



CONTROL OF TEMPERATURE AS A FUNCTION OF EXCESS AIR

The relationship of how combustion air level can affect temperature has just been shown. Temperature also plays an important role in the combustion of waste. Temperatures need to be maintained at levels high enough to ensure pathogen destruction and to sustain the combustion reaction. However, temperatures that are too high also cause problems. Continuous exposure of the combustor refractory to high temperatures is generally not desirable because it can cause the ash to fuse and can cause damage to the refractory.

Waste Characteristics

The primary characteristics of the waste that affect the combustion reaction are:

- The heating value
- The moisture content
- The chlorine content

Different wastes have different heating values and moisture contents. They will affect the combustion process.

The HEATING VALUE of a waste is a measure of the energy released when the waste is burned. It is measured in units of Btu/lb (J/kg). A heating value of about 5,000 Btu/lb ($11.6x10^{-6}$ J/kg) or greater is needed to sustain combustion. Wastes with lower heating values can be burned but they will not maintain adequate temperature without the addition of auxiliary fuel. The heating value of the waste can be used to calculate total heat input to the incinerator where:

Heat Input (Btu/h) = Feed Rate (lb/h) x Heating Value (Btu/lb)

Heat input to the incinerator will affect temperature. More heat input yields higher temperature. Heat input also will affect air requirements; more air is required (1 SCF/100 Btu).

MOISTURE is evaporated from the waste as the temperature of the waste is raised in the combustion chamber. It passes through the incinerator, unchanged, as water vapor. Evaporation of moisture uses energy and reduces the temperature in the combustion chamber.

CHLORINE in plastics or solvents in the waste feed will react to form hydrochloric acid (HCl). This HCl can be an emission problem. It can create corrosion problems of the equipment downstream from the incinerator.

The heating value (Btu value) and moisture varies widely. Compare plastics (high Btu, no moisture) to beddings, shavings, etc. to anatomical.

Summary of Key Operation Factors Affecting Combustion

1 Key factors are interrelated.
2 Air quality/distribution
3 Sufficient air for complete reaction
4 Distributed to promote mixing
5 Mixing
6 Assure contact of oxygen and organics
7 Temperature
8 High enough to sustain combustion
9 High enough to have complete reaction
10 Residence/retention time
11 Sufficient time to allow reaction to complete

Waste Characteristics are also important

12 Heating value
13 Measure of energy released

14 Heat input determines air required
15 Moisture content
16 Requires energy to vaporize water
17 Chlorine content
18 Affects HCl emissions

This summarizes the key parameters affecting combustion.

Products of Combustion Reaction

Complete Combustion

The primary products of waste incineration are:

- Combustion gases
- Solid residue (ash)
- Energy

The primary objectives of the combustion process are to generate an ash residue that is sterile (free of pathogens) and does not contain unburned, recognizable wastes; and to minimize air pollutants in the combustion gas stream.

The organic materials that enter the incinerator with the waste and fuel are primarily made up of carbon, hydrogen, and oxygen. Ideally, these organic materials react with oxygen in the combustion gas to form carbon dioxide and water vapor. The chemical reaction for this ideal situation is

$$\underset{(C,\ H,\ 0)}{\text{Organics}} + O_2 + \text{Heat} \longrightarrow CO_2 + H_2O + \text{Heat}$$

This ideal reaction represents complete combustion.

Incomplete Combustion

However, this ideal reaction does not occur in operating waste combustion systems. Factors that lead to a less than ideal reaction are poor mixing, too little combustion air, and low temperatures. Under those conditions products of incomplete combustion are emitted with the stack gases. The most common product of incomplete combustion is CO. Another product of incomplete combustion that often is emitted under poor mixing conditions or high temperature, low excess air conditions, is elemental carbon (or soot). The soot particles are very fine and generally result in high opacity at the combustion stack. Other products of incomplete combustion that cause concern because of their health impacts are hazardous organic compounds such as benzene, dioxins, and furans. Although these compounds are not found in the waste, under incomplete combustion conditions they can be formed as intermediate combustion products.

The waste feed also includes inorganic materials; generally, they are not involved in the combustion reaction. The inorganic materials in the waste feed (ash) are either retained in the ash or are emitted as particulate matter in the combustion gas. Air velocities in the combustion bed are controlled to reduce the amount of inorganic material entrained (picked up by) the combustion gas and emitted with the combustion gas. If combustion is not complete, organics will remain in ash; this is typical…it is atypical to have 100 percent combustion of ash bed. Under poor conditions (low temperature, low turbulence in ash bed) may have pathogens remaining in ash; i.e., may not sterilize ash.

Combustion Indicators

The information presented in the above section suggests that the following indicators can be used to monitor combustion quality.

Opacity

The opacity of the combustion gas stream is a measure of the degree to which the stack gas plume blocks light.

- High opacities indicate high emissions.
- Opacity is primarily caused by noncombustible ash or uncombusted carbon (soot) in the flue gas.
- High opacities can indicate poor mixing or low levels of combustion air.
- High opacities also may be generated by high levels of HCl emissions or poor burner operation in the secondary chamber.

If a large amount of water vapor is present in the combustion gas, the water can condense when it cools as it leaves the stack forming a dense white "steam plume." This is not an indicator of poor combustion and should not be confused with a black or white smoke plume caused by soot or acid gases. Opacity can be visually determined by a person or measured by an instrument.

Other indicators which provide information about combustion conditions are measurements of the combustion gas oxygen and CO levels. However, these measurements require instruments and most facilities do not have those instruments.

Ash Quality

Visual appearance of ash can be an indicator of combustion problems. If an incinerator is operating properly, little organic material will remain in the ash. Whitish gray ash indicates better burnout and less carbon than black. The extent of organics combustion can be measured by the quantity of combustible materials remaining in the ash. Noted increases in combustibles in the ash indicate a combustion problem which may include bed temperatures that are too low, improper distribution of combustion air in the bed, or insufficient waste retention times.

SECTION 3

PHOTOS OF THE INCINERATOR

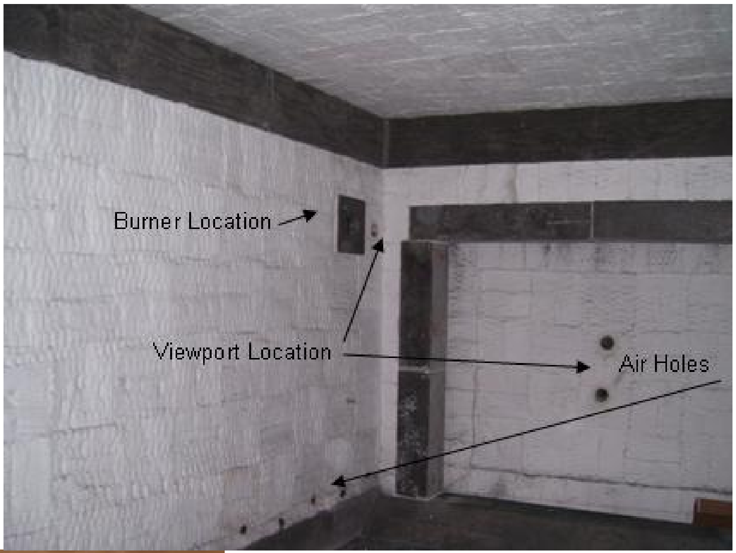
NOTE some of these are sample photos and may not depict the actual Incinerator components

Primary (right) & Secondary (left) Chambers

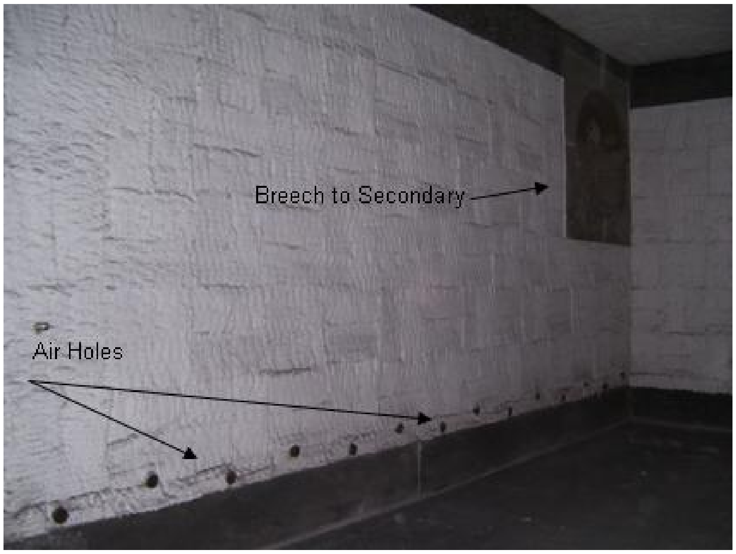
NOTE **Stack sections and breech have not been installed.**

Primary Chamber Access Door View

Primary Chamber Interior View (sample picture)



Floor and grate detail



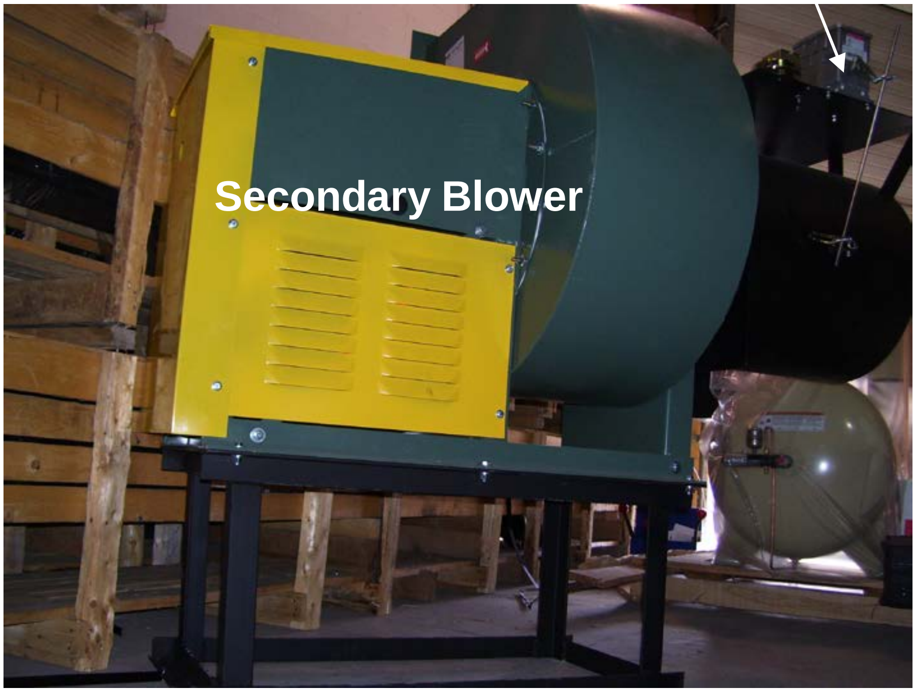
Secondary Chamber Door View

Secondary Chamber / T-section View

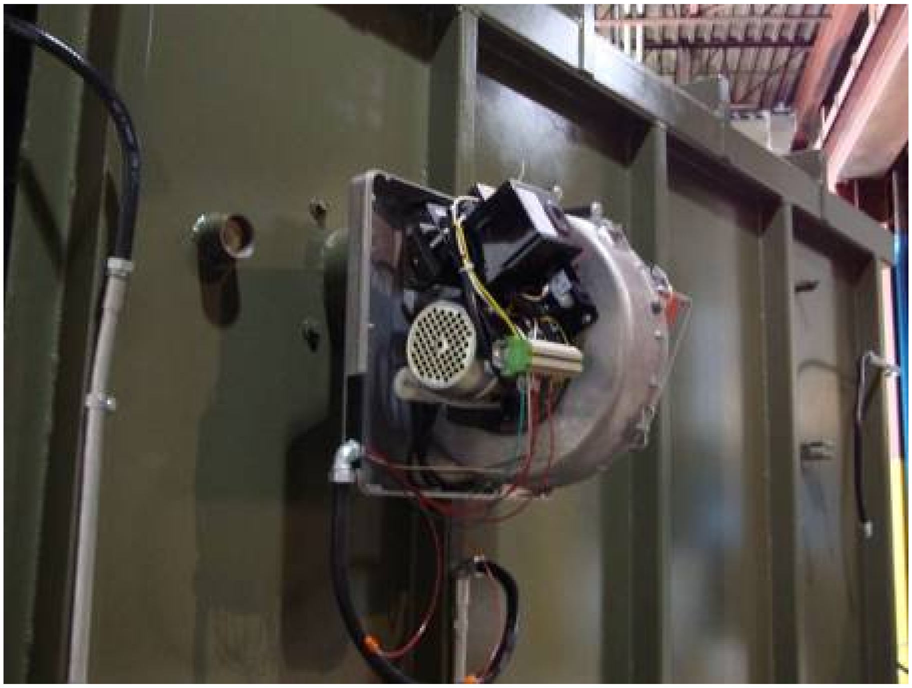
Primary Chamber Blower

Secondary Chamber Blower

Adjustable Damper and Modutrol Motor



Primary Chamber Burner



NOTE Burner is shown without cover installed.

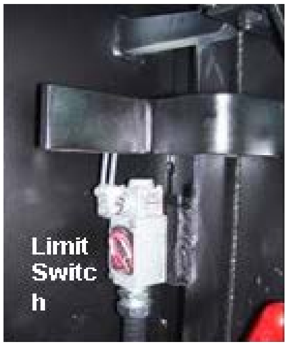
Diesel Tank (4,500lt)

Secondary Chamber Burner

Waste Oil Tank (5,000lt)

Main Control Panel

Thermocouple, Viewport and Limit Switch



T-Stack and Stack Sections

Spark Arrestor

SECTION 4

ASSEMBLY & INSTALLATION INSTRUCTIONS

General Assembly and Installation Overview

The incinerator is factory pre-assembled to ensure proper fit then shipped disassembled. On-site assembly by certified trade's people is required. Trades people (Riggers, Mechanical Contractors, Millwrights, Electricians, Gas Fitters, etc) are to be arranged by Purchaser and/or Contractor.

This is a **general overview**, therefore, project specific details must still be considered. Please refer to relevant data and drawings supplied by EWS.

Purchaser/Contractor Responsibilities

These responsibilities include, but are not limited to, the following:

1. Ensure all concrete and structural steelwork, as may be required, is adequate to support the incinerator and associated equipment. The Purchaser/Contractor is responsible for all concrete design such as slab thickness, footing depths and dimensions and any placement reinforcement so as to be consistent with all applicable building codes.

2. Supply of any anchor bolts when applicable.

3. Provide all utility services to the equipment including fuel, electrical, water, air, etc, as may be required.

4. Provide adequate air makeup to the incinerator room through forced air circulation blowers, air intakes and/or opened louvers to avoid the creation of negative pressures within the building.

5. Observe caution in the selection of materials and coating of building walls or other structural components to the incinerator area giving due consideration to high-localized temperatures of the incinerator.

6. Provide all external thermal insulation when required on steam piping, water piping, etc.

   NOTE External thermal insulation should never be applied to any surface of the incinerator or refractory lined stacks and breeching. If applied to these surfaces, structural damage may result.

7. Provide proper roof thimbles, clearances, flashing and counter flashing around all roof penetrations, including the incinerator stack.

8. Guying of all stacks (if required) is to be done by the Purchaser/Contractor. Guying should be at three points at 120° apart or four points at 90° apart. The Purchaser/Contractor provides design of guying and guying connection points to the stacks. Torque draw band bolts to 35 lbs. during stack assembly.

9. Provide proper protection of all equipment from damage, vandalism and weather, while on-site and/or when installation is in progress.

10. Provide all touch up painting and cleanup of equipment after erection.

11. Inspect and field weld miscellaneous flanges, when applicable.

12. Supply all main fuel line regulators at connection points to the Incinerator. Fuel lines should be sized for maximum pressures and instantaneous fuel flow at cold starting. Pressures should be based under flow conditions, not static. Static pressure should never exceed the design pressure of the pressure regulator. Gas volume includes burner pilot requirements.

13. General Arrangement drawings are normally provided by EWS. As soon as possible after acknowledgement of a Purchaser/Contractor's order, it is the responsibility of the Purchaser/Contractor to provide EWS with all applicable sketches, layouts, building drawings, roof and floor elevations and other pertinent information to allow preparation of the General Arrangement drawings. With this information, the Purchaser/Contractor's will provide desired orientation of the chambers.

14. The Purchaser/Contractor must recognize the importance of proper waste material descriptions concerning physical and chemical properties. Changes in waste composition to be incinerated should be made known to EWS, as soon as possible.

15. It is the Purchaser/Contractor's responsibility to obtain all construction, operating and environmental/air emissions permits as may be required in the area of jurisdiction for the incinerator equipment. EWS will assist in supplying all technical information required for these permits to the Purchaser/Contractor.

16. The Purchaser/Contractor must be aware that certain components will be broken down for shipment purposes and reassembly will be required in the field by the Purchaser/Contractor.

17. Locating and mounting the incinerator in a confined area should be avoided. The Purchaser/Contractor should maintain ample space around all equipment for maintenance, cleaning and safety considerations. A rule of thumb would be to provide a minimum of six feet from all major equipment surfaces and edges. Always allow proper space for the swing radius of loading doors, cleanout doors and electrical panel doors. If space limitations exist, it is the Purchaser/Contractor's responsibility to make EWS aware of these dimensional restraints so that modifications may be considered.

18. Do not scale drawings: If certain dimensions are required which are not shown on drawings, the Purchaser/Contractor should contact EWS Project Manager. EWS will not be responsible for any dimensional conflicts resulting from dimensions not shown on a certified drawing. Do not use general sales literature or other general equipment submittals for construction unless so indicated. EWS reserves the right to change equipment dimensions as required for design purposes.

19. All drawing dimensions are typically subject to ¼"tolerances.

20. If the refractory is shipped in the green condition, the refractory has not been heat cured. This curing process must be accomplished in the field after final erection and assembly. It is understood that the Purchaser/Contractor will provide all required utilities for this curing process and initial equipment operation for adjustments at no expense to EWS including but not limited to fuel, electrical, water, etc.

21. Due to the physical size of the incinerator, the unit is shipped partially dismantled and will, therefore, require reassembly in the field. Consult EWS for maximum component weights so that properly sized cranes are available at the site for unloading and erecting. Purchaser/Contractor may, also therefore, have to reinstall electrical components and control connections, burners, blowers, lifters, etc. These connections are normally of the flexible type with leads marked.

22. Lifting lugs are provided on chambers, stacks, and major accessories. These lugs should be used in setting the pieces into position. Do not attach lifting chains or cables to piping, control panel or mounting flanges as they may be damaged. Avoid dragging lifting gear across painted surfaces as this will cause damage to the high temperature paint. When placing the incinerator into position be extremely careful not to subject the refractory to mechanical shock as this may result in refractory damage.

Step by Step Assembly and Installation Instructions

The following **sequence** applies specifically to the Meliadine Waste Incinerator.

Trades-people required for the following steps:

Forklift Operator, Crane Operator, Riggers, Electrician and Mechanical Contractors (pipe and gas fitter)

Please refer to the supplied drawings and data.

Foundation Drawing: Anchor Bolt and Loading Diagram ECO1.75TN1PVC100L-00D rev.0

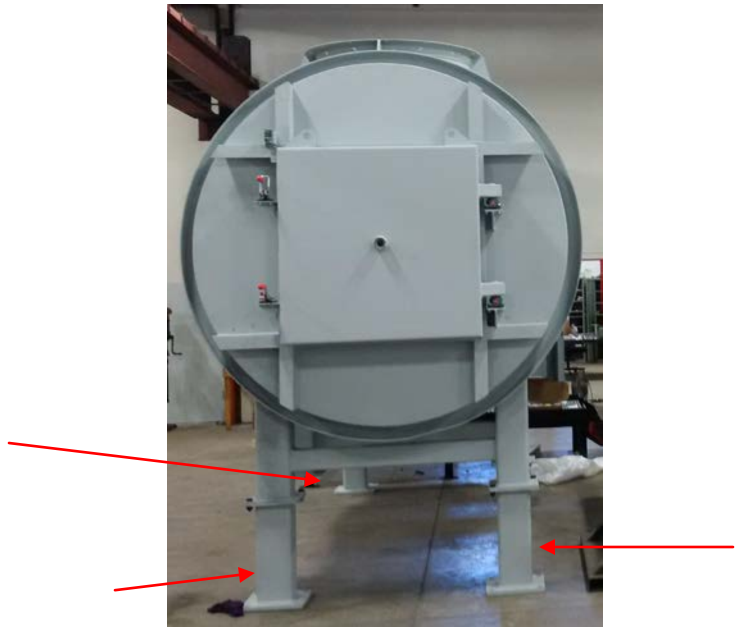
1. The incinerator and related components must be installed on a level concrete pad. It is recommended that appropriate consultation with civil engineers and/or architects is taken before designing an appropriate foundation for the equipment.

2. Please refer to General Arrangement Drawing ECO1.75TN1PVC100L-00A rev.1 and its Bill of Materials.

Place the Primary Chamber and Secondary Chamber on the Foundation

3. Locate leg extension for the Secondary Chamber and put into position.

4. Once the leg extensions have been put into place, using a crane, lift the **Secondary Chamber** into position and connect the leg extensions.



Leg extensions

5. Position the Secondary Chamber (item 2) beside the Primary Chamber (Item 1) on the level concrete pad. Ensure that the breech openings on each Chamber are facing each other.

6. Shim with steel shim plates to ensure the Secondary Chamber is level. This is required to prevent rocking, or any movement of the **Secondary Chamber.**

Connecting the Breech to the Secondary Chamber

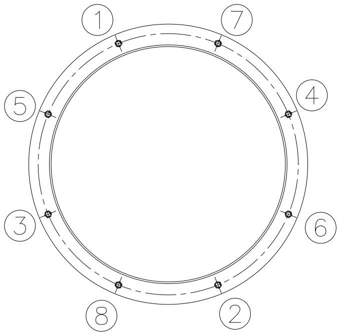
1. Install the **Secondary Breech Gasket,** by spraying the gasket adhesive on the Breech connecting flange and on the gasket material. Line up holes of the **Secondary Breech Gasket** to line up with the flange bolt holes. Press **Secondary Breech Gasket** onto flange securely.

Gasket adhesive spray being applied

Correctly Installed Gasket

2. Raise the **Breech** (Item 7) with forklift and slings, once the **Breech** is 8 to 13 cm from the flange, use alignment bars to help with the final alignment of the two (2) breech flanges, as shown below.

3. Once breech flanges are aligned and together bolt flanges together using the numerical order described in the pattern below using hardware provided.



Correctly installed Breech on Secondary Chamber

Position the Primary Chamber

1. Install the **Primary Breech Gasket,** by spraying the gasket adhesive on the Breech connecting flange and on the gasket material. Line up holes of the **Primary Breech Gasket** to line up with the flange bolt holes. Press **Primary Breech Gasket** onto flange securely.

Gasket NOT installed

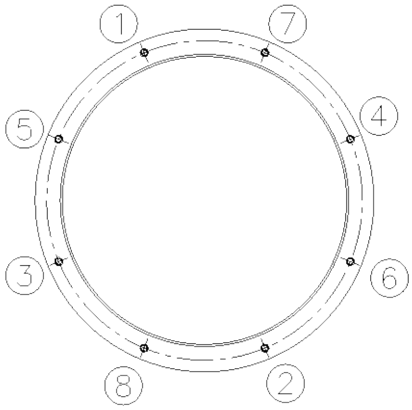
Correctly Installed Gasket

2. While constantly checking alignment of the **Breech** move **Primary Chamber** along the floor using the forklift and skates until the flanges are aligned.

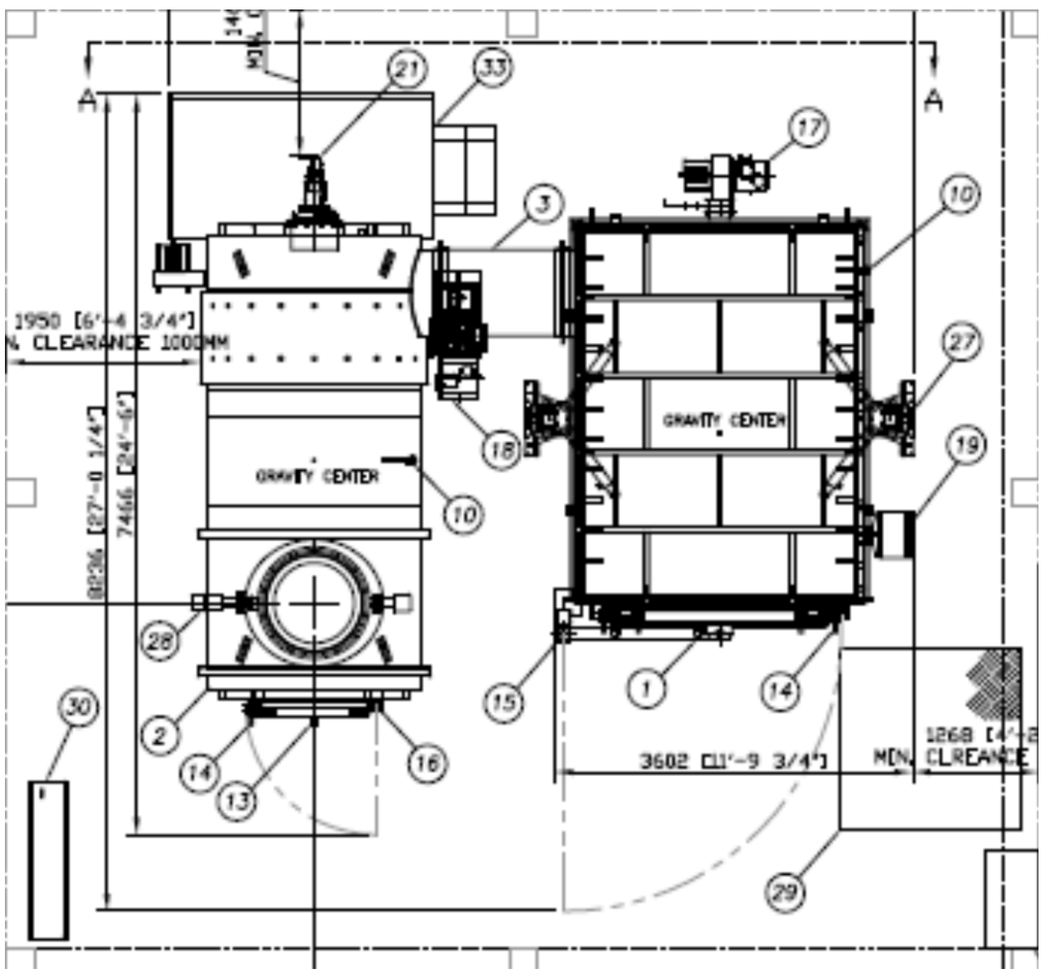
NOTE Do NOT pull the Primary Chamber closer to the Secondary Chamber with the flange bolts. Doing so will bow the steep plate, in turn damaging the breech refractory.

3. Once breech flanges are aligned bolt flanges together, shim and level the Primary Chamber with steel shim plates. Support pads should be shimmed as required to prevent rocking, or any movement of the Primary Chamber.

4. Using the numerical order described in the pattern below using hardware provided.



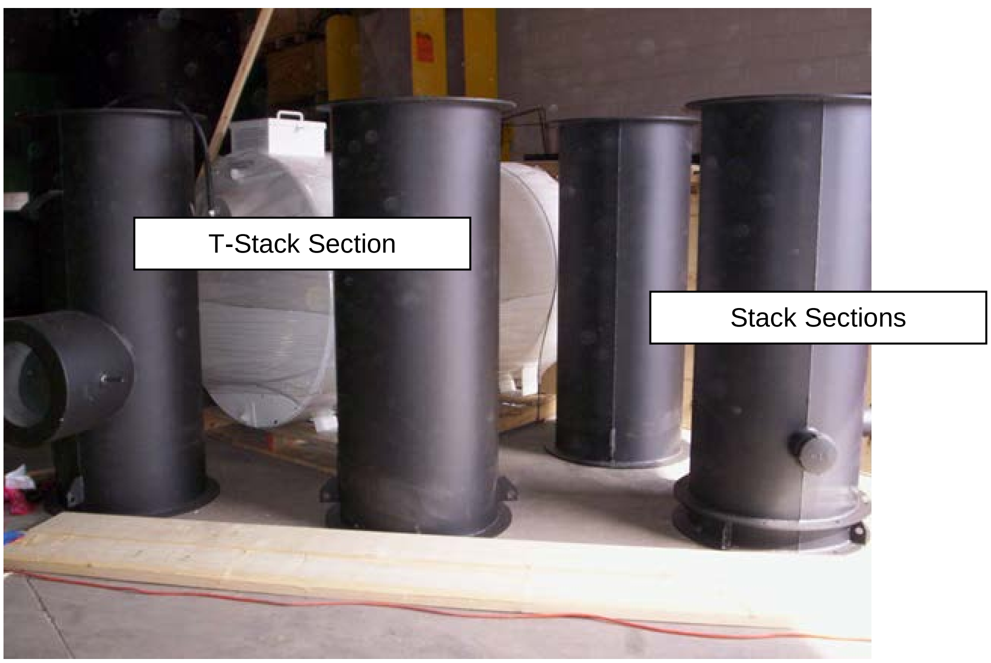
Correctly Installed Breech on Primary Chamber



NOTE The diagram above shows the burners and blowers already attached to the Primary and Secondary Chambers. When positioning the Primary Chamber, Breech and Secondary Chamber, these items will not be attached.

Installing the Stack
Install stack gaskets between stack sections.

Install refractory-lined *T-Stack Section* on top of the *Secondary Chamber* using the hardware provided. Then install the next four *Stack Sections and the spark arrestor* as per the drawing using hardware provided.

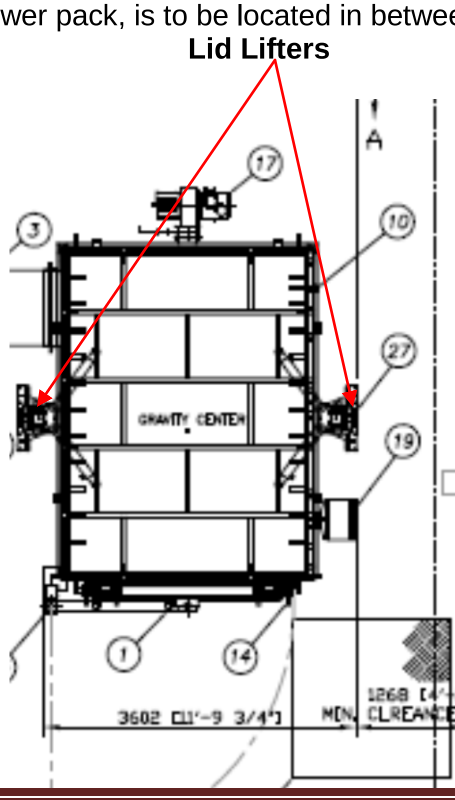


T-Stack and Stack Sections

This is a Sample Photo only of Erection of the Stack Sections

Installing the Lid Lifters

1. Place the lid lifters (item 27) on either end of the Primary Chamber. The slave column, the one without the hydraulic power pack, is to be located in between the chambers.



2. Once lifters are in place, shim and level, do not exceed 2.54 cm under the column. Anchor the columns to the floor.

3. Install the pre-assembled hydraulic pump on the master column reinforcement and connect the hydraulic hose and piping.

4. Install the limit switches, proximity switches and solenoid valves with the hardware provided.

5. Install the control stations for the lid lifters (attached to junction box at the master column). Location determined by customer.

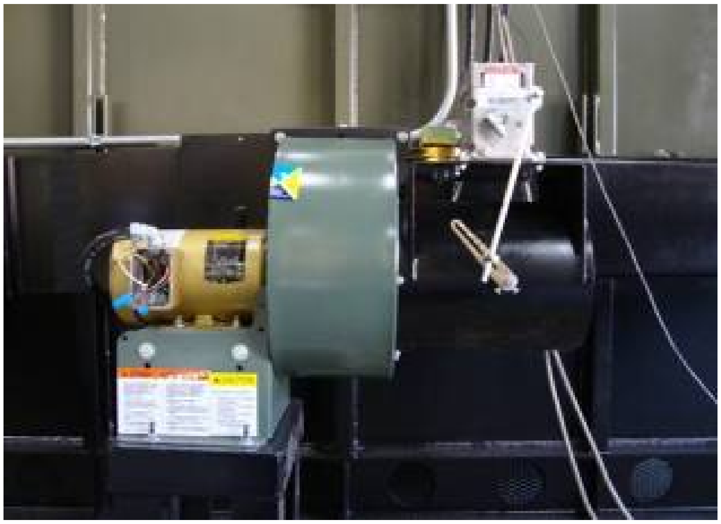
For further detail consult the OEM manual of this lifter in 6515-S-265-008-280-EDS-0015_Sub002.pages175to190

Assembling and Installing the Primary Chamber Blower

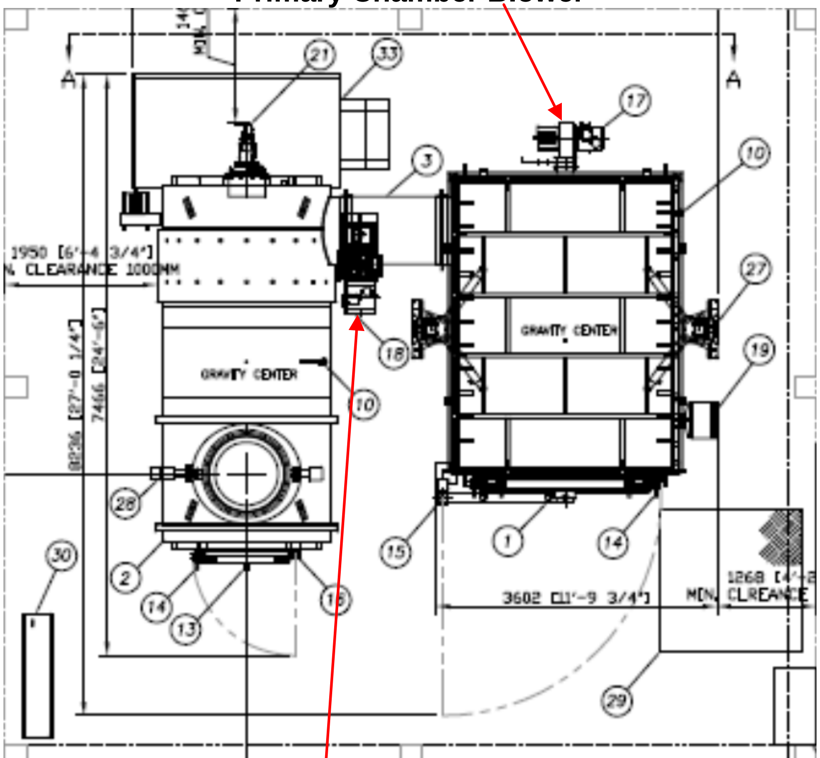
1. Place the **Primary Blower** mounting frame where the **Primary Blower** is to be installed.

2. Install **Primary Blower**, shim and level as required with steel shim plates until the flanges are align. Support pads should be shimmed as required to prevent rocking.

3. Bolt together using bolts provided after alignment of all bolt holes



Primary Chamber Blower



Secondary Chamber Blower

Assembling and Installing the Secondary Chamber Blower

1. Place the **Secondary Blower** mounting frame where the **Secondary Blower** is to be installed.

2. Install **Secondary Blower**, shim and level as required with steel shim plates until the connecting flanges are level.

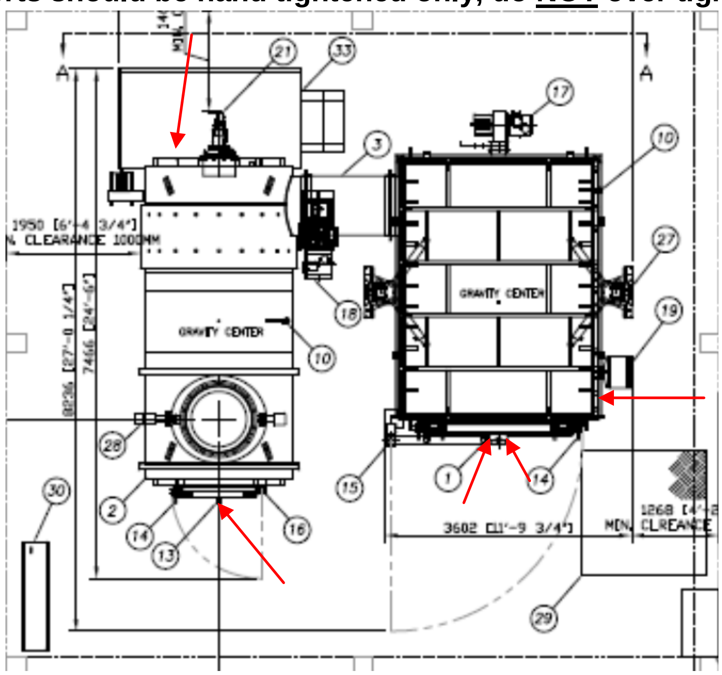
3. Bolt together using bolts provided after alignment of all bolt holes.

Secondary Chamber Blower

Installing the View Ports

1. Install four (5) 2" threaded **Viewports** at positions indicated in red below on **Primary Chamber** door, the left hand side of the **Primary Chamber Burner,** the **Secondary Chamber** door and the right hand side of the **Secondary Chamber Burner.**

NOTE The viewports should be hand tightened only, do NOT over tighten.

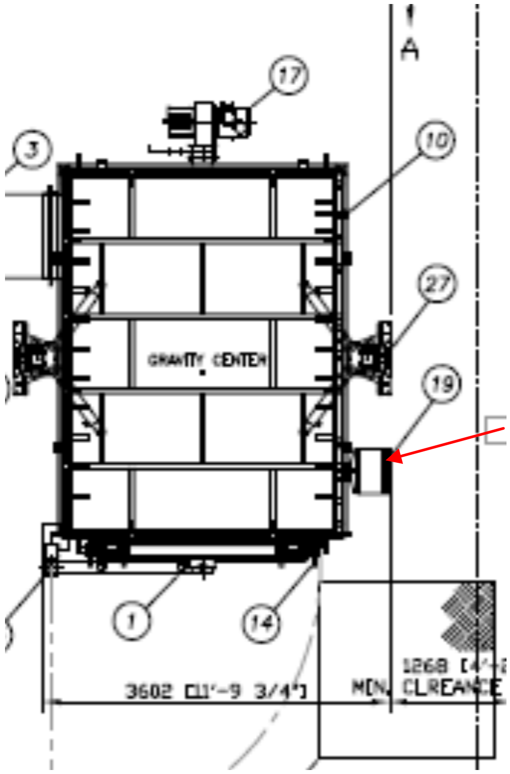


Installing the Primary Chamber Burner

1. Install the **Primary Burner** and burner gasket in the burner port located on the right side of the **Primary Chamber**.

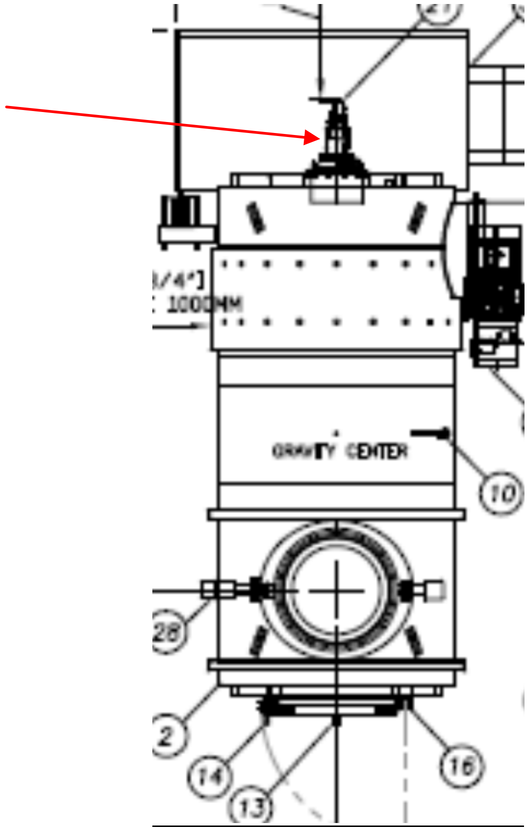
2. Bolt together using provided hardware after alignment of all bolt holes.

Primary Burner shown without red cover installed.



Installing the Secondary Chamber Dual Burner

1. Install the **Secondary Chamber Burner** and gasket in secondary burner ports using the hardware provided. The fuel train is pre-assembled and the final installation to follow the P&ID drawing



It is the customer's responsibility to conform to any local codes when installing the Waste Oil System.

Positioning and Installing the Diesel Tank

The Fuel Tanks are to be installed at ground level as per the site layout. Locations are to be determined by the customer to satisfy all local codes. Interconnecting piping and filters for each burner have been shipped with the equipment

Fuel Connections

Reference: General Arrangement ECO1.75TN1PVC100L-00A rev.1 and P&ID ECO1.75TN1PVC100L-00B rev.1 drawings

NOTE All fuel connections to be done by a certified technician and should satisfy all local codes (all lines to be pressure tested), including the distance between the incinerator system and the fuel tanks. If not properly installed and maintained, the waste oil tank (see image) can become a serious threat to the environment. Ensure the installation follows all local regulations and environmental protection measures.

Even though the tank is double walled, it is highly recommended that the installation site of the storage tank be equipped with a secondary containment system consisting of the following: dikes, berms, or retaining walls and a floor. The floor should cover the entire area within the dike, berm or retaining wall.

WASTE OIL PIPING TRAIN
The Waste Oil piping train consists of:
1. Pump skid.
2. Interconnecting piping.
3. Fuel train to dual burner.

When installing the waste oil piping train check to ensure that:
- Piping is clean.
- That the pipe has been reamed and free of burrs
- The work is done to trade standards

To perform the installation a (½" and 1") pipe threader is needed.

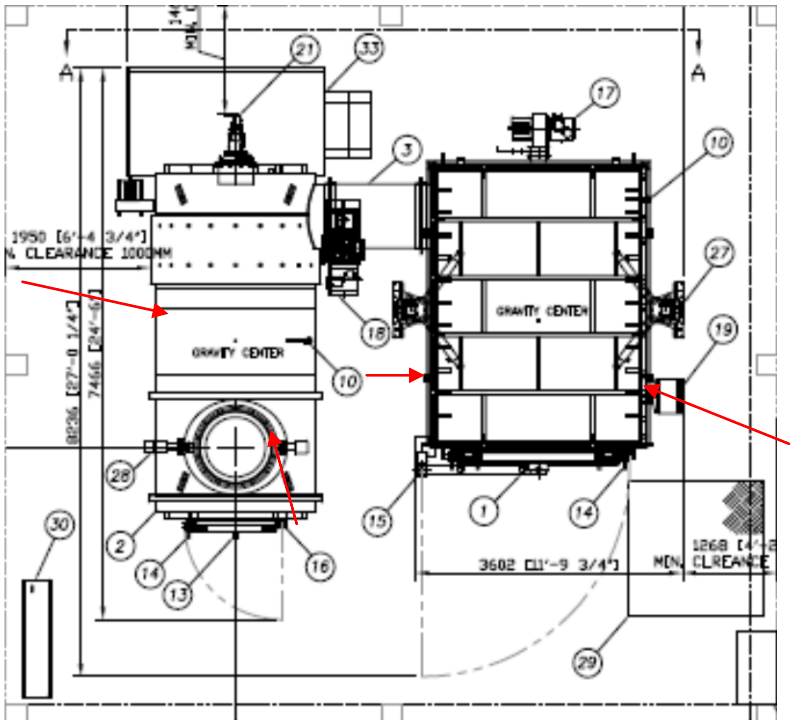
Note: When the pipe installation is complete flush out the line to remove any sediment and dirt that may have contaminated the pipes.

This incinerator system includes two (2) waste oil totes and their correspondent containment, as well as spill kits according to the volume, these items are to be deployed by the customer according with their waste management plan.

Also, two (2) ash bins are included for the storage of the ash removed from the incinerator.

Installing the Thermocouples

1. Install the four (4) ¾" threaded **Thermocouples** at the positions indicated in red below: two (2) in the **Primary Chamber,** one (1) on **Secondary Chamber** and one (1) on **T-Stack**



Installing the Weigh Scale

The weigh scale is to be installed closer to the loading point (to be determined by customer) and anchor it (note: the loading of this incinerator is intended to be through the roof when the lid is in the open position.

Electrical Connections

Reference: **Electrical Drawings ECO1.75TN1PVC100L-10A / B/ C/ D rev.0** (17drawings)

NOTE All electrical connections, terminations and conduit installation to be done by a certified electrician and should satisfy all local codes.

1. The **Main Control Panel** should be installed at a minimum of 8' from the Incinerator system.

2. Wiring is necessary (customer's scope) from the power source to the **Main Control Panel** and between the **Main Control Panel** and the **Junction Boxes** on the incinerator and all Teck Cable from the junction boxes to the components.

3. The **Thermocouples** must be wired directly to the thermocouple input card on the **PLC** with the thermocouple wire provided, without splicing the wire. Interconnecting cable has been shipped with the equipment

4. Connect terminal wires. Connect main electrical feed through conduit connection in the bottom of the panel enclosure to the line terminals on the disconnect switch.

5. Run cables to scale and tank

Start Up and Commissioning EWS Field Services

Do not attempt to place the equipment into operation until an EWS Service Technician has inspected all equipment and interlocks.

1. Upon completion of mechanical erection, interconnection of equipment and provisions of utilities as described above, arrangements should be made with the EWS field service department for scheduling of a service technician for initial start-up.

2. An EWS representative must perform start-up of all incinerator systems unless specifically arranged otherwise in writing by EWS.

3. Attempts to start-up incinerator systems by the buyer without prior written approval may result in revocation of all expressed or implied warranties.

SECTION 5

OPERATING INSTRUCTIONS

Important Information

Proper operating and maintenance procedures must be followed in order for the ECO Model Incinerator system to perform at maximum efficiency.

<u>Do not attempt to start or operate this equipment until this Operator Manual is read thoroughly and is understood</u>.

The equipment has been designed with many safety features, however, like all thermal processes; this equipment is not free from the inherent hazards of high temperature processes.

<u>Safety procedures and precautions must be followed at ALL times during operation.</u>

There are safety procedures outlined in this Manual, however, no amount of written instruction can replace good judgment and safe operating practices.

<u>Responsibility for the safe operation and maintenance of the equipment supplied rests solely on those operating it.</u>

There are many engineered features incorporated into the ECO Model Incinerator system to free the operator of repetitive chores. They do not, however, relieve the operator of maintenance responsibilities. In order to maximize the operating life of the equipment, it is strongly recommended that the maintenance procedures, outlined in Section 6, be followed diligently. It is advisable to keep an equipment log for recording maintenance activities along with unusual operation.

NOTE

In the event that the equipment is not operating in the normal manner, contact Eco Waste Solutions immediately at (905) 634-7022 and ask for Customer Service Manager. It is important to report problems as soon as they are noticed to minimize damage that faulty operation could cause.

Design Specification Criteria

The **ECO 1.75 TN 1PVC100L incinerator systems** was designed specifically for the **Meliadine Mine.** Based on information provided, the EWS team designed an incinerator with the following criteria in mind.

Waste Description and Assumptions

Solid waste:

- Food waste (food, food packaging and containers, plastic and paper waste from food preparation) - 50%
- Domestic waste (paper, plastics, bottles, newsprint, cans, cardboard) - 40% Packaging (cardboard boxes, paper, plastic containers, plastic film, Styrofoam, poly-weave bags) - 10%
- Absorbents (Rags, wipes, spill cleanup materials) - negligible
- Medical waste (bandages, dressings, gloves, swabs, syringes, sharps) - Negligible

Waste Oil:

- Used Oils (hydraulic, transmission, motor, crankcase, gear box, synthetic and brake fluids)

The waste is expected to be bagged or stored in skips/bins around the mine operation and then brought to the incinerator building by truck. The waste oils will be brought to the incinerator by totes (handling by forklift or pallet jack).

Waste Quantity

The incinerator is designed to process and treat the waste generated on site, up to 1,750 kg per day. Therefore the ECO 1.75TN 1PVC100L incinerator system was selected, as it will process up to 1,750 kg of camp waste per day in a single batch.

Incinerator Design Parameters

Incinerator Design Parameters	Unit	Details
Secondary Chamber Operating Temperature	°C	1000
Secondary Chamber Retention Time	s	2 (minimum)
Incineration capacity	Kg/day	~~1700~~ 1750
Charge per cycle	Kg	1700
Burn Cycle Duration for entire load	h	less than 10
Cool Down Cycle Duration	h	8 to 12

NOTE

This incinerator was only designed for the type of waste and amount of waste mentioned above. It is important that the waste quantities and characteristics described above are processed in the incinerator. Otherwise, the incinerator system will not operate properly.

It is also important to note that some waste-streams are unacceptable and SHOULD NOT be processed in the incinerator.

Unacceptable Waste-streams

The following is a list of some of the waste streams that should not be processed in this system.

Waste Materials Not Suitable for Processing in Eco Waste Solutions Technology

Solid Waste	Description	Origin
Bulky Materials	Automotive or heavy equipment parts such as engine blocks and transmissions	From vehicles and equipment maintenance shop
Non-Combustible Materials	Drywall, asbestos, bricks, concrete, soils	Construction activity
Radioactive Materials	Smoke detectors, laboratory wastes	From Buildings, laboratories
Potentially Explosive Materials	Large propane tanks, other pressurized vessels. Actual explosives	From warehouse, plant and production facilities
Heavy Metals	Items containing lead, mercury, cadmium, for example: batteries, electronic devices, fittings, old pipe work, fluorescent light bulbs, electrical switches, thermometers, PVC plastics, aluminum solder, photovoltaic cells	From maintenance activities, operations and construction activities
Liquid Waste	**Description**	**Origin**
High Alkaline or High Acid Materials	By-products of industrial processes, unrefined fuels	From warehouse, plant and production facilities
Solvents	Solvents such as acetone, xylene, methanol	From vehicles and equipment maintenance shop

Important Notes:

1. These lists are guides and should not be assumed to be an exhaustive list of materials
2. A waste and procurement audit is highly recommended and encouraged to ensure that all sources of heavy metals (especially mercury) are identified and diverted from the incinerator

General Operating Overview

The operation of the **ECO 1.75TN 1PVC100L Incinerator** package follows 7 general steps that take place over a 24-hour period.

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
Load waste into Primary Chamber and Close Doors	General Inspection of System	Start Burn Cycle from Main Control Panel	Observe Burn from site ports and HMI.	Clean out Ash and dispose	Perform daily Preventive Maint. Procedures	Record Keeping

Although all 7 steps are critical in the general operation of the incinerator system, this section of the manual focuses on **Step 1, Step 3** and **Step 4** and how to start the system and monitor it during operation.

It is assumed, at this point, that the waste material is properly loaded with the weight, density and type the incinerator is designed for, as outlined on page 5 of this section.

It is also assumed that the waste is loaded after the ash has been removed from the previous burn cycle and any daily maintenance routines have been completed.

This section will also cover **Step 7** on how to use the historical charts, store incinerator data, and access incinerator historical information for record keeping purposes.

Monitoring and Data Acquisition System

Overview

The **Human Machine Interface (HMI)** system automatically monitors the entire process and all system inputs are recorded and logged for record-keeping purposes and also allows for historical trending of key operating conditions.

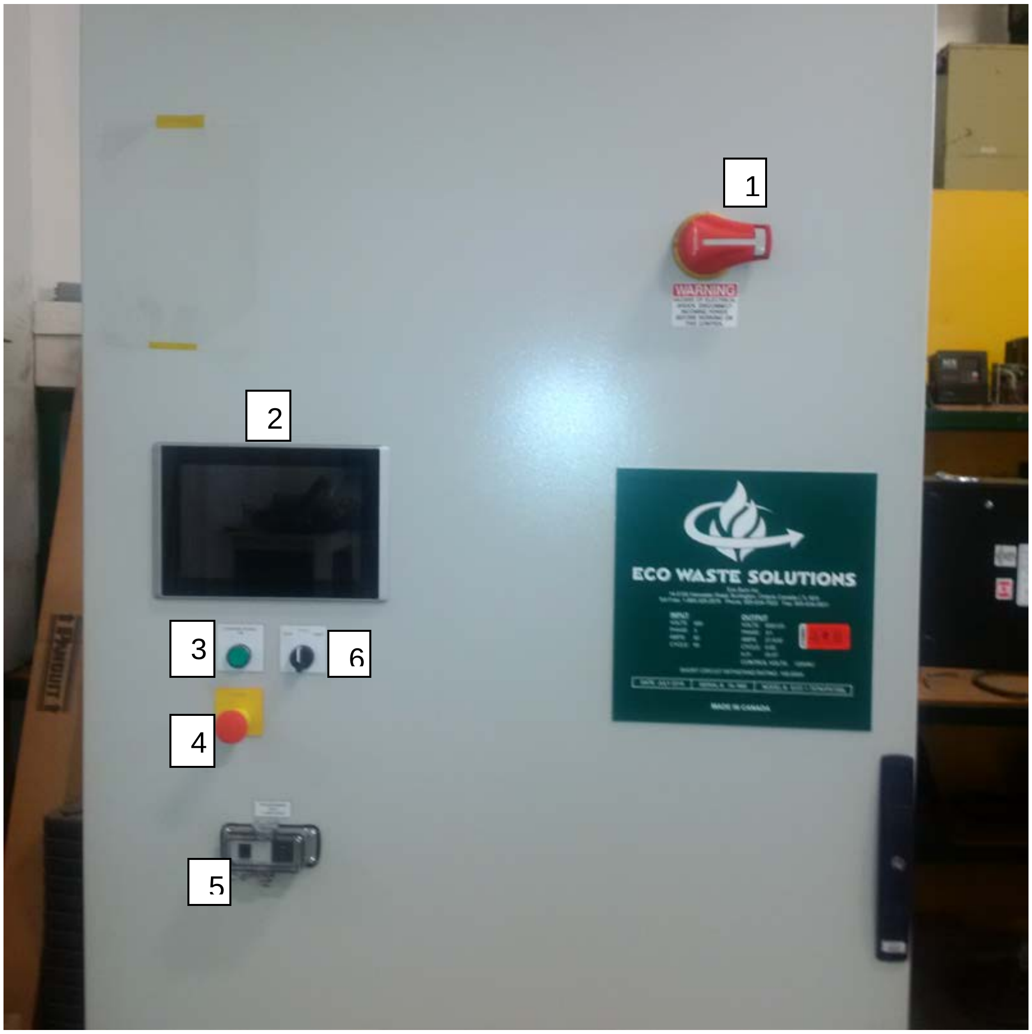
The integrated **Human Machine Interface (HMI)** in the Main Control Panel monitors and records the following:

1. Temperature sensors
2. Differential pressure sensor with transmitter (draft)
3. Monitoring of burner functions
4. Auxiliary burner operation and fan amperage monitoring via current transducer
5. Door position interlock monitoring
6. High temperature limit and interlock
7. Low Fuel level limit and interlock
8. Air proving switch interlocks
9. Waste loading records

All data can be transferred to storage by using USB port (to transfer to PC to print)

HMI Operator Interface

Main Control Panel Components



Number	Name	Purpose
1	**Main Disconnect Switch**	Isolates the incinerator from its source of electric power.
2	**Human Machine (Operator) Interface**	Displays various screens reflecting system performance.
3	**Control Power ON**	1. Green light indicates the control power in the panel is on. 2. Pushing it if the **Emergency-Stop** is out will turn on the control power.
4	**Emergency Stop Pushbutton**	When pushed, shuts down the system and disables any possibility of starting it.
5	**Communications Port**	Allows for communication to/from the PLC
6	**Start Switch**	Activates the system

The Human Machine Interface (HMI)

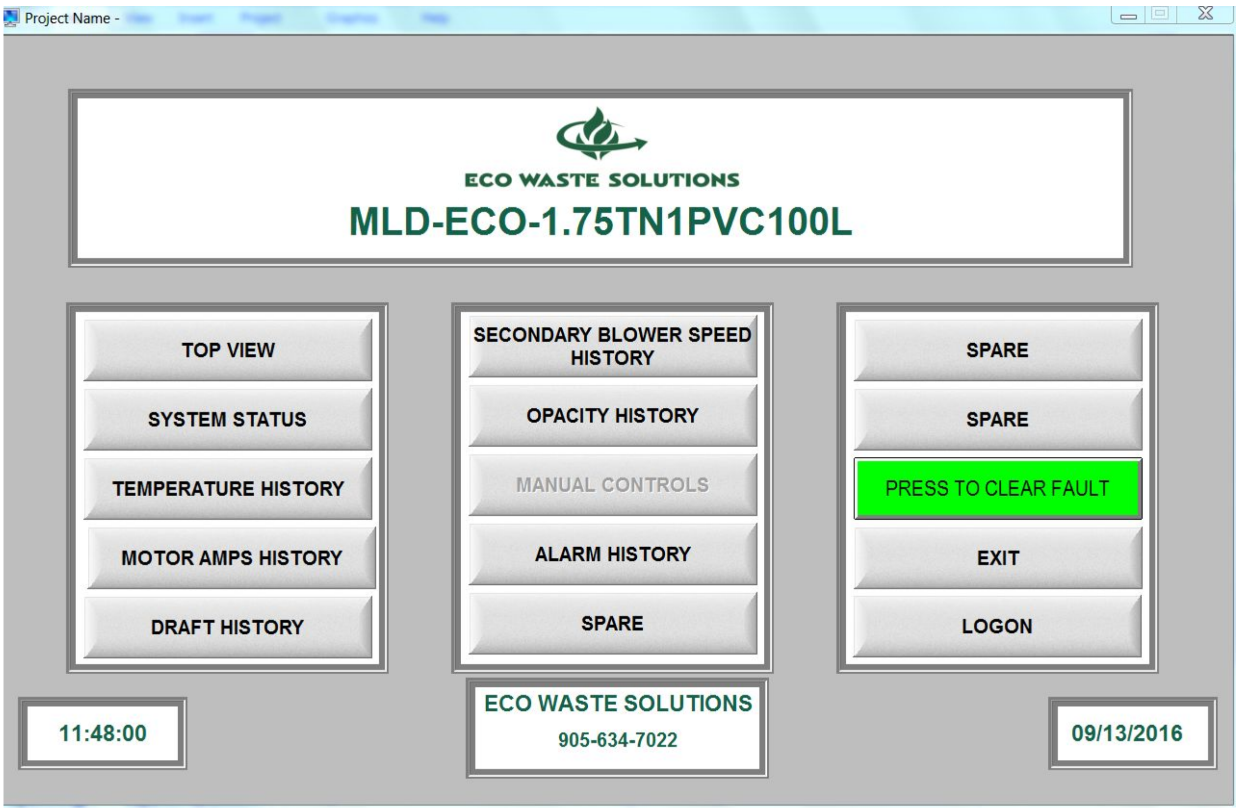
The **Human Machine Interface (HMI)** controls the operation of the incinerator directly from the **Main Control Panel.**

The **Main Menu** screen displays all the available options for viewing the system in operation.

The **Human Machine Interface (HMI)** has a touch-screen and items can be selected by touching them on the screen.

Main Menu

The first screen the operator will view is the **Main Menu** (see below).



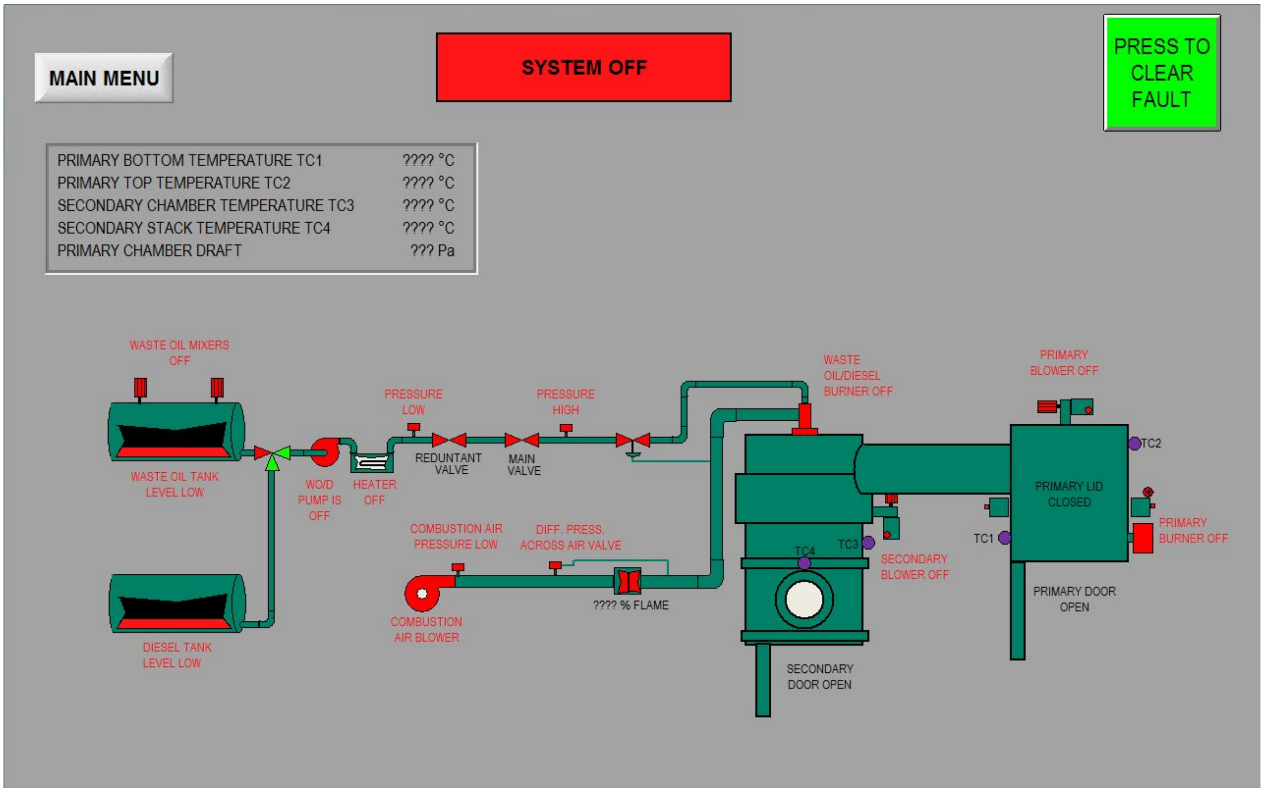
Top View

When the ***Top View*** button is selected, an overview of the incinerator and related components is displayed. This shows key temperatures, flows, and other indicators of what is happening in the process in a real-time basis.

NOTE

The system will not start if there are alarms or faults present. Clear and/or acknowledge faults.

At any time, touch **Main Menu** to go back to the main screen.

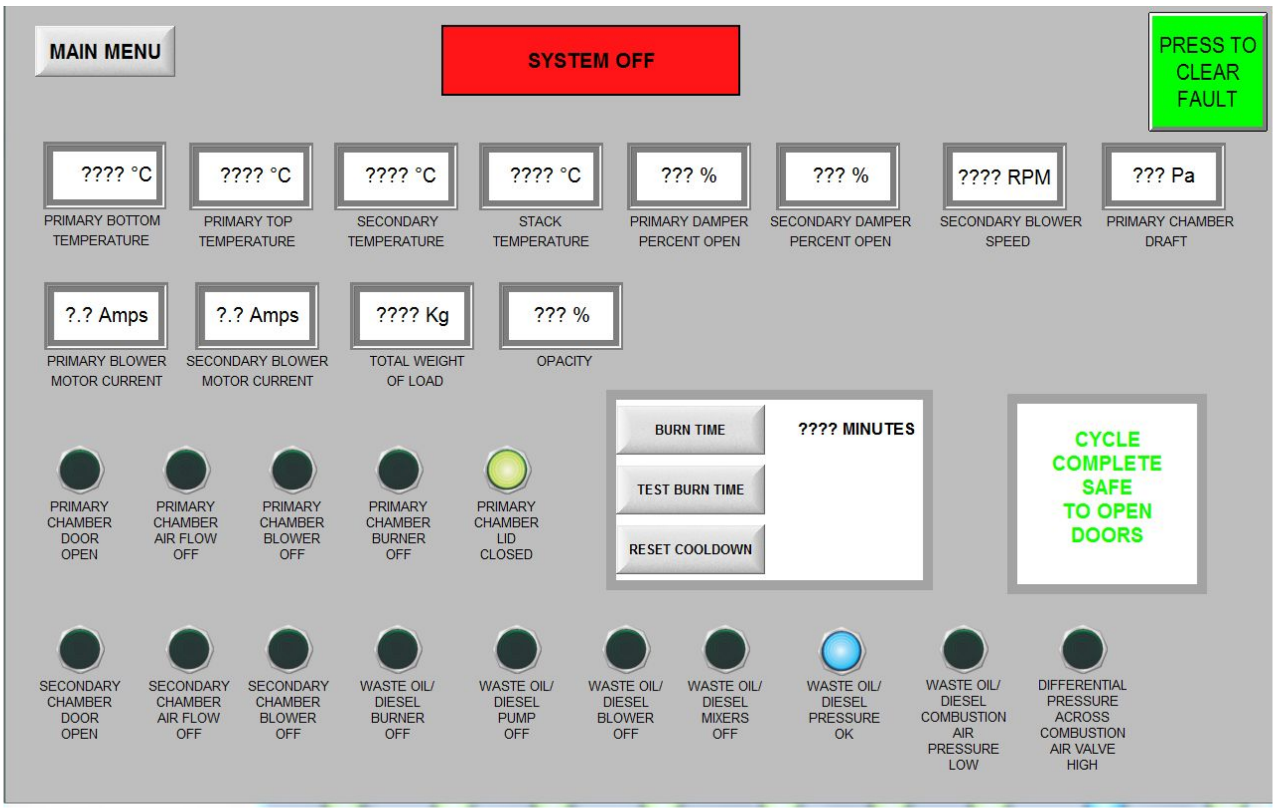


System Status

When the ***System Status*** button is selected from the **Main Menu,** a screen will display the status of all the operating parameters of the incinerator, such as the temperatures and the time remaining in the cycle, as well as displaying other informational items such as status of the door, lid lifter, blowers, etc.

The operator can change the burn time of the cycle by selecting "BURN TIME" and entering a time (in minutes). The operator may do this over time to either prolong the burn time, or decrease the burn time depending on the waste mixture; for example a very wet batch of garbage will take more time to burn than a dryer batch of waste.

At any time, touch **Main Menu** to go back to the main screen.



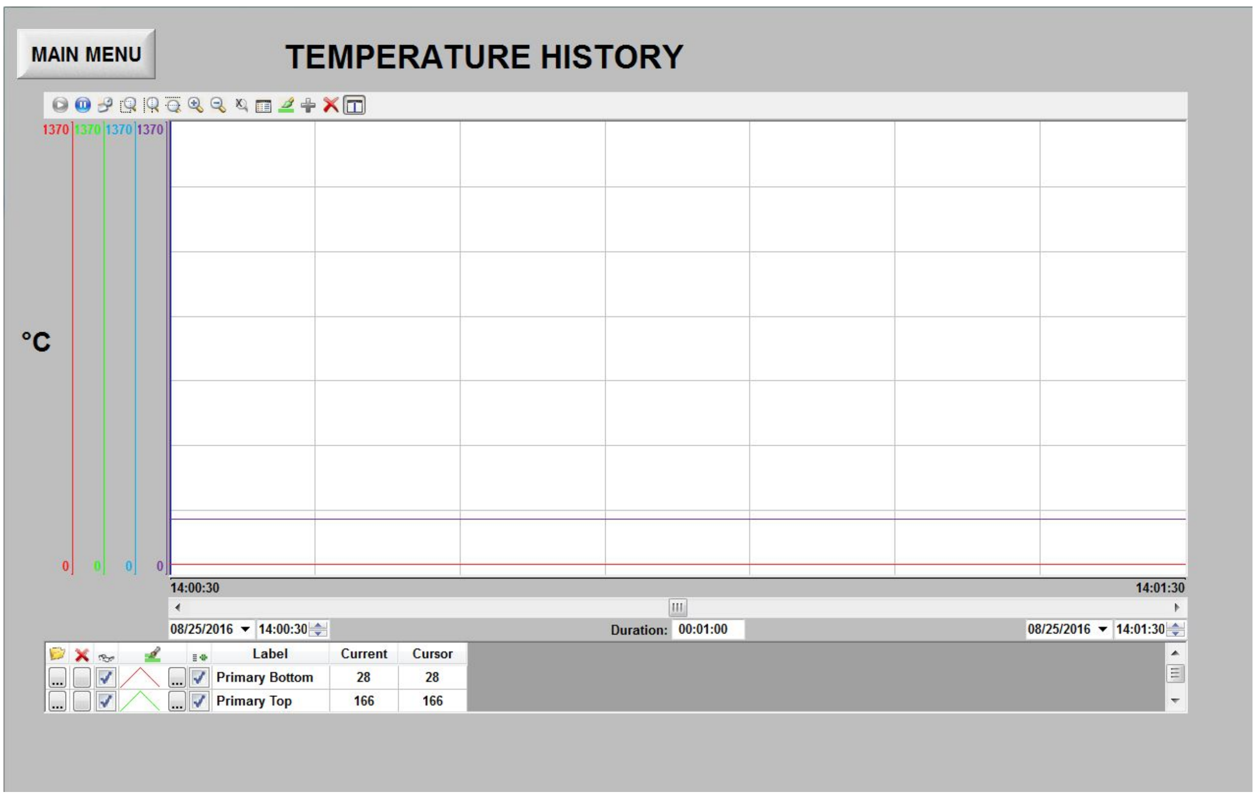
Overview of Historical Charts

The **Human Machine Interface (HMI)** monitors and records (every minute) critical operating parameters of the incinerator system like the temperature, motors, draft, load weights and alarms. Each operating parameter has its own graphic display for the operator to view, at any given time. Each display can easily be selected from the **Main Menu** of the **Human Machine Interface (HMI)**. The display will show the specific data collected from previous burn cycles.

This **Incinerator Data** is important for regulatory purposes and for general operating purposes. Also, the incinerator data is to be downloaded on a weekly basis to USB key for record-keeping purposes.

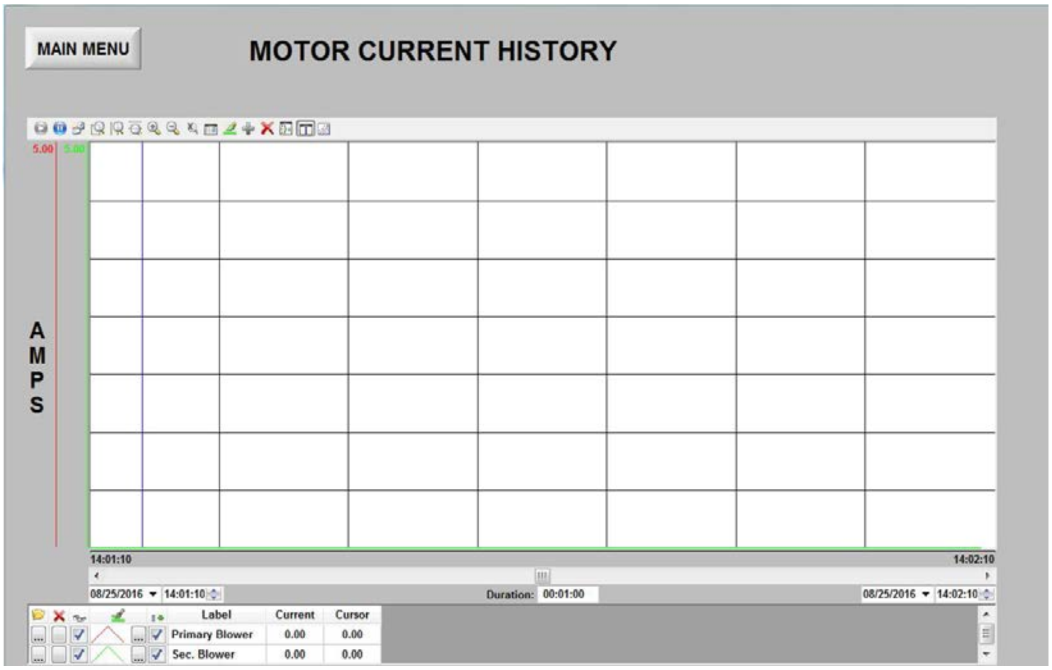
Temperature History

For example, when the ***Temperature History*** button is selected, the screen will display the trend in temperature during the operation of the system, include date & time of occurrence of that specific temperature.



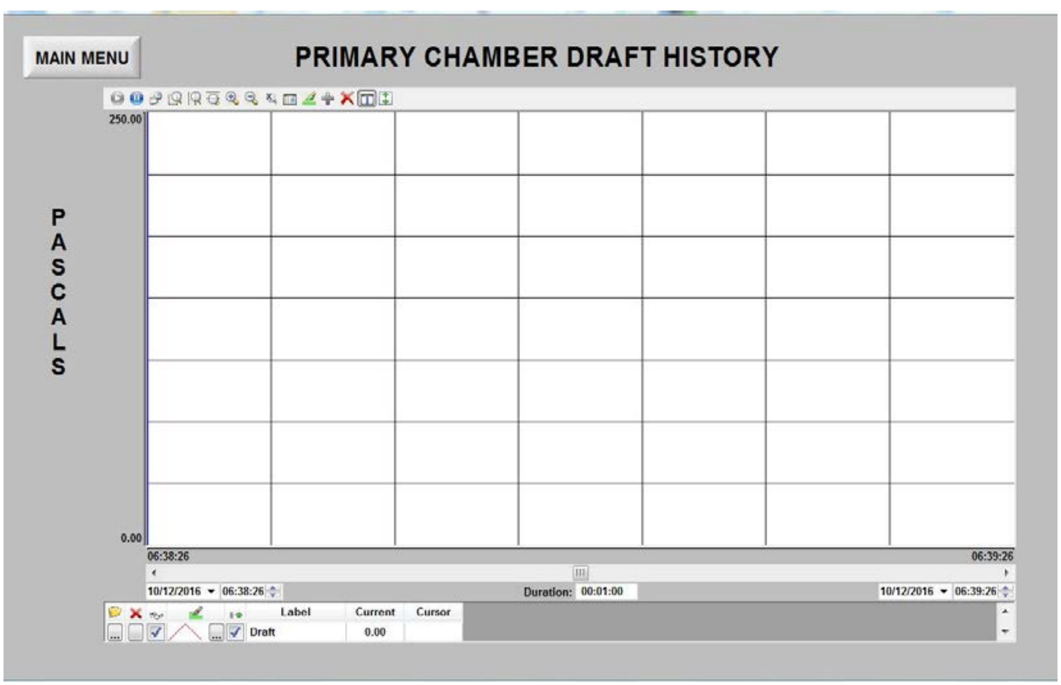
Motor Currents History

When the ***Motor Currents History*** is selected a screen will display the motor currents from the Primary Burner and the Secondary Burner, in AMPS, during the operation of the system, including date & time of occurrence of that specific motor current.



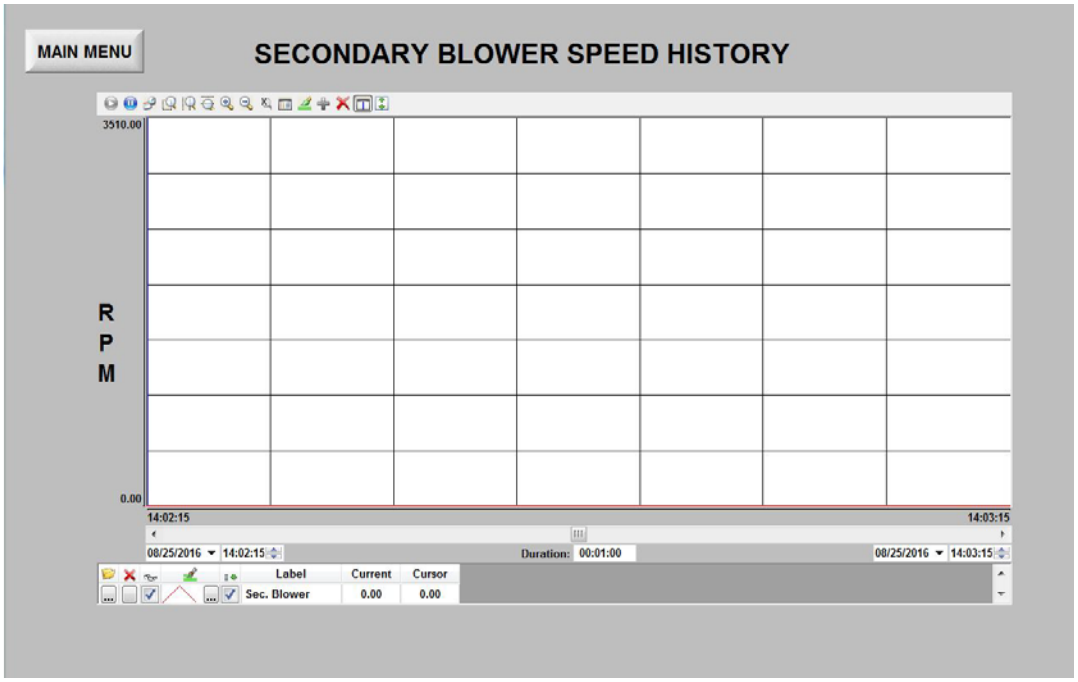
Draft History

When the ***Draft History*** button is selected a screen will display the draft during the operation of the system, include date & time of occurrence of that specific draft trend.



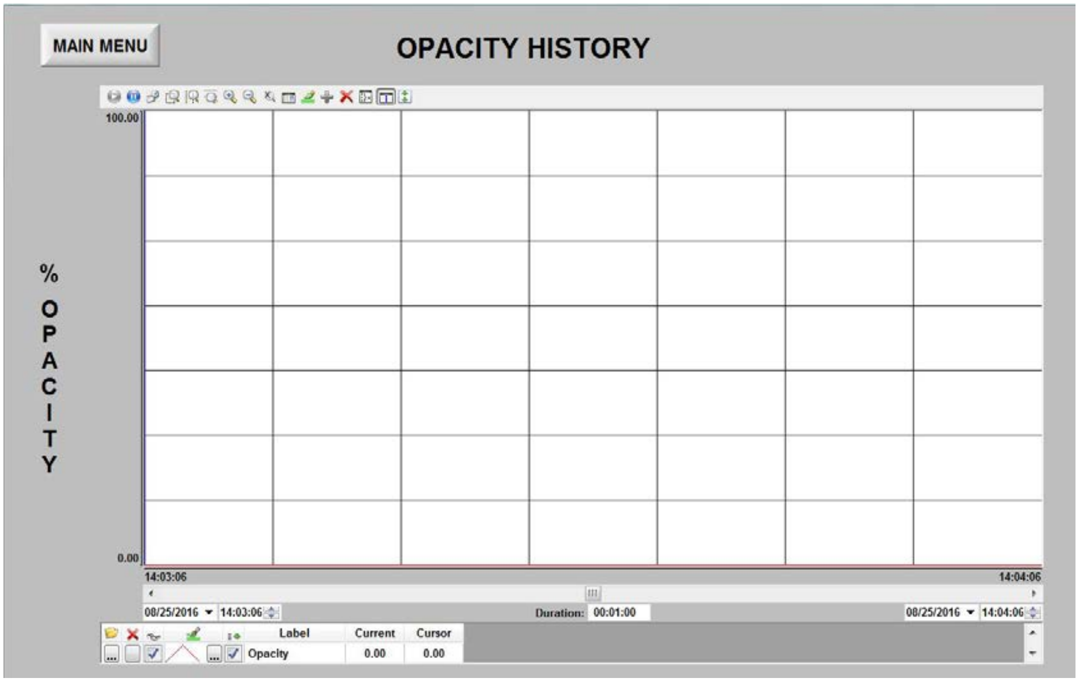
Secondary Blower Speed History

When the ***Secondary Blower Speed History*** button is selected a screen will display the RPM during the operation of the system, include date & time of occurrence of that specific speed.



Opacity History

When the ***Opacity History*** button is selected a screen will display the Opacity during the operation of the system, include date & time of occurrence of that specific reading.

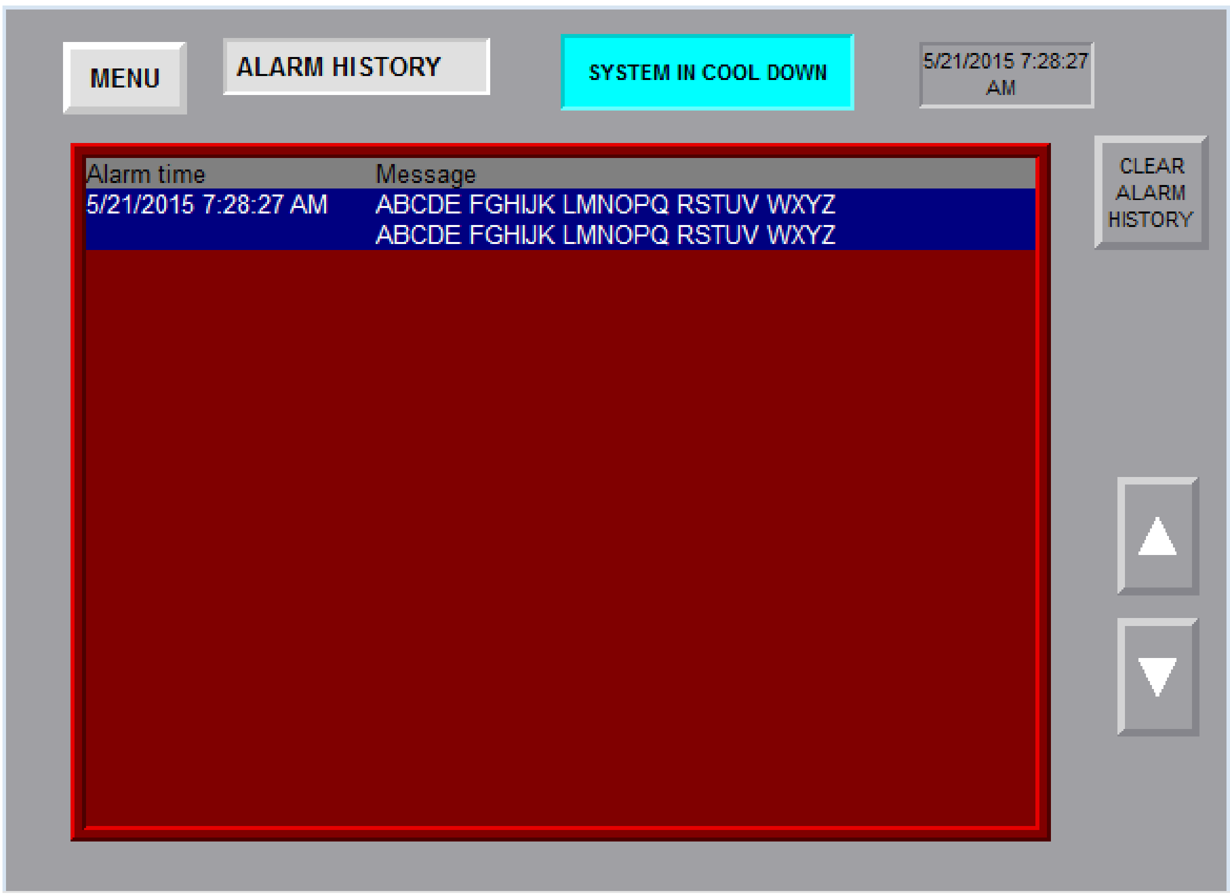


Alarm History

When the ***Alarm History*** button is selected a screen will display the last 128 faults with the date & time of occurrence.

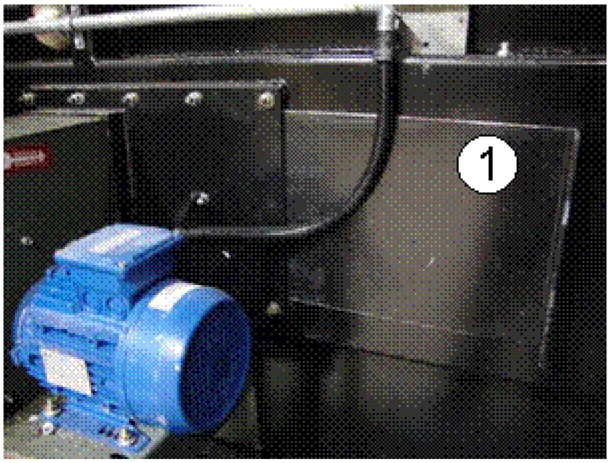
The operator can press the *CLEAR ALARM HISTORY* to clear all of the faults, if they wish to. This does not affect the record-keeping feature of the system.

At any time, touch **Main Menu** to go back to the main screen.

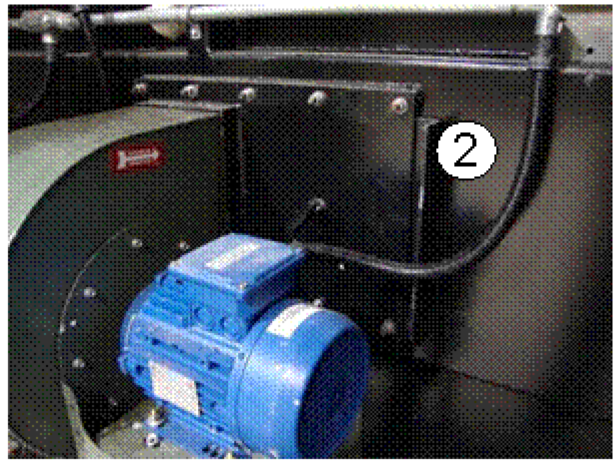


Incinerator Daily Start up

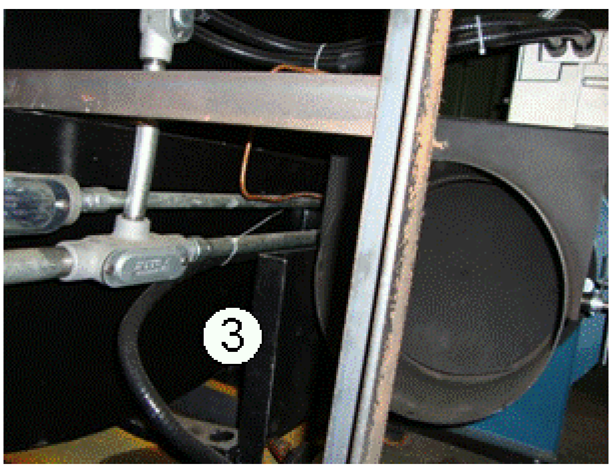
1. Ensure that manual slide gates for each blower are in the open position for free airflow into the **Primary and Secondary Chambers**.



1. **Primary Chamber Blower** Manual Slide Gate Open



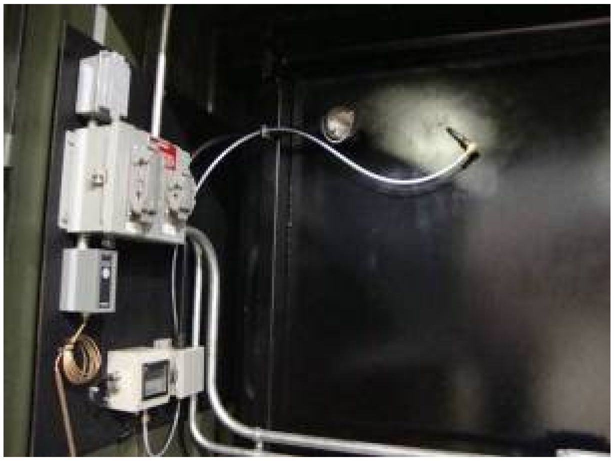
2. **Primary Chamber Blower** Manual Slide Gate Closed



3. **Secondary Chamber Blower** Manual Slide Gate Open

2. Visually inspect the burner hoses to ensure that there are no fuel leaks. Check to see if lines are brittle or cracked, check for any oil spills near the burner, which would indicate a leak.

3. Ensure the draft gauge hose connection is tight and sealed. This is a clear flexible tubing located in the **Primary Chamber** (see photo below).



Sample picture

4. Unlatch all clamps on the **Primary Chamber** door, open and secure in the open position

5. Ensure the Primary Chamber floor is cool (less than 90°C). Remove all the ash from the previous burn and store ash is ash bins.
6. Lock the **Primary Chamber** Front Loading Door and ensure all latches are properly engaged.

If the floor is too hot the waste may spontaneously catch on fire during loading.

High Output dual Burner Secondary Chamber Start-up

SYSTEM CHECK

Filter & Pump.(sample image)

Do a walk around the Waste Oil System, ensuring that there are no leaks, all ball valves are in the proper and fully open position for either Diesel or Waste Oil according to the fuel to be used for this specific cycle

Ensure that the correspondent storage tank has enough fuel for the entire cycle.

Using Waste Oil: 800 L minimum of Waste Oil and 300 L minimum of Diesel (the Primary Chamber operated with Diesel only)

Using Diesel Only: 1100 L of Diesel minimum

Both the Waste Oil and Diesel Tanks require at least 150L stored at all time to keep the level sensor closed.

Clean the filter if necessary.

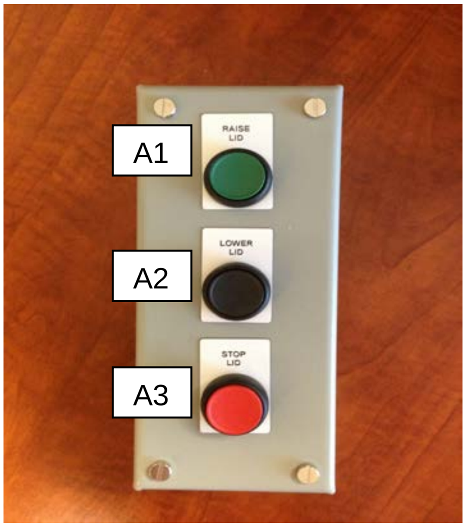
Check that all of the ball valves on the burner fuel oil train are fully open

Check that the Incinerator is not in cool down and the Primary temperature is 90°C or less.

Loading Procedure

Operator Stations for Lid Lifter

The Primary Chamber of the ECO 1.75TN 1PVC100L Waste Incinerator has a lid lifter to allow the roof of the chamber to be opened for quick loading of the waste.



Number	Name	Purpose
A1	**Raise Lid**	Raises the Lid on the Primary Chamber
A2	**Lower Lid**	Lowers the Lid on the Primary Chamber
A3	**Stop Lid**	Stops the lid during raising or lowering.

Once the roof is opened, the chamber can be loaded by the operator with the waste going to the incinerator.

Operating the Integrated Weigh Scale

1. The Operator has two options for managing the waste quantity prior to loading the selected Primary Chamber:

    i. Option 1: The operator will use the hoppers (previously tarred) to load waste onto the weigh scale.

    ii. Option 2: The operator may load waste/garbage (in bags/boxes) on the weigh scale directly.

2. Regardless of the option selected above, once the waste is on the weigh scale the Operator has to push the RECORD WEIGHT (black button) on the Weigh Scale Push-Button Station. By pressing this button, the weight value of that particular load of waste is sent to the PLC and the weight is recorded. At this time, the MAXIMUM WEIGHT (green button) will flash green once to show that the weight has been logged.

3. Then, the operator must take the waste and load it into the Primary Chamber. The hopper is to be raised just past the top edge of the Primary Chamber (using proper lifting equipment by others).

4. Once the hopper clears the edge of the Primary Chamber, the hopper's content can be dumped inside the chamber.

5. The empty hopper can now be pulled from the edge of the chamber and then lowered.

6. The operator returns to the weigh scale with some more waste and repeats Steps 2 to 6. This entire procedure is repeated until the maximum load weight for the Primary Chamber is reached. The PLC will indicate this to the operator when the MAXIMUM WEIGHT (green light) comes on and remains on. This indicates that the maximum weight permitted, in this case, the incinerator is designed for a maximum of 1,750Kg of waste material.

NOTE

No more waste should be loaded into the Primary Chamber after the load has reached the maximum weight.

7. The Primary Chamber is loaded, and the incinerator is ready to start.

Tips for loading: To decrease burn time and allow for more uniform burn.

a. Load the less dense waste first

b. Load dry waste first. Placing wet waste near the top of the Primary Chamber allows moisture to evaporate early in the cycle.

NOTE

Do not load waste greater than 90 Kg using the top loading system. This waste is to be loaded from the front of the unit. Loading waste over 90 Kg from the top will cause refractory floor to fracture.

NOTE

Do not throw the waste towards the sides of the Primary Chamber. Doing so will damage the ceramic blanket refractory.

NOTE

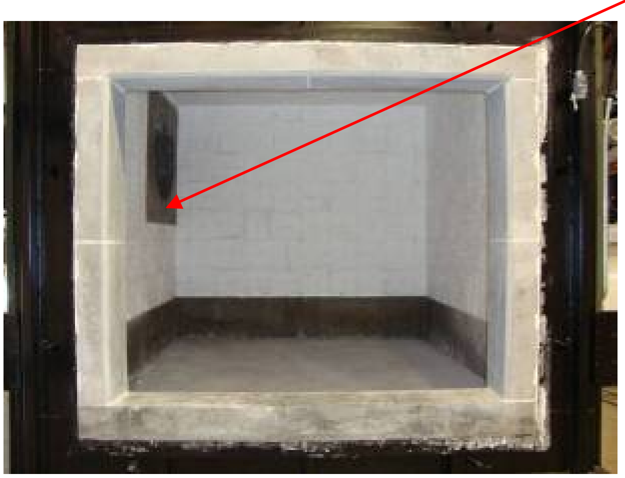
Load only the waste stream that the system has been designed for. DO NOT load a lot of high BTU rated waste for one burn (e.g. do not load more than three (3) gallons of bacon grease, kitchen grease or cooking oil). Doing so will result in excessive temperatures in the system reducing the life of the refractory.

NOTE

Do not load the Primary Chamber above its rated capacity by weight.

NOTE

Do not load the Primary Chamber such that the Breech and Burner section is blocked in any way.



Breech Opening

Burner port

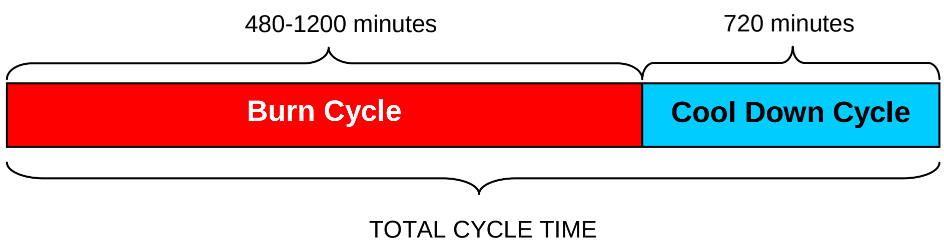
8. Inspect the lid ledge of the Primary Chamber and remove any debris that will prevent a tight seal with the lid.
9. Close the **Primary Chamber** lid by pressing the close button on the Lid Lifter Station. The lid will initially raise, after 0.5 seconds the safety pawls will pull out. Two seconds after sensing that the safety pawls are out the lid will lower.
10. The lid will keep lowering until either the down limit switch is activated or the stop button is pressed.
11. If the stop button was pushed just press the close button to resume lowering. The lid will raise then lower again. When the lid is stopped by either the lower limit switch or the stop button the safety pawls will be released back in.
12. Proceed to the **Main Control Panel.**

NOTE

The burn time will be set to the previous burn, if you wish to change the set time, proceed to the Primary Status screen and click on the BURN TIME button. The minimum number of minutes you can enter is 480 (8 hours). When you have finished, the time will be displayed in minutes beside the BURN TIME button

NOTE

The burn time value (in minutes) determines the length of the burn cycle before cool down cycle starts.



13. Check that the PRIMARY DOOR AND LID are closed on the **Human Machine Interface (HMI)** screens.
14. Check that no alarms are displayed on the **Human Machine Interface (HMI)**
15. Check that the EMERGENCY STOP BUTTON is out.
16. Check the GREEN CONTROL POWER BUTTON is lit up. Press this button to power on the control panel
17. On the **Main Control Panel turn the SELECTOR SWITCH** to the right to start the cycle. The following steps will automatically take place, controlled by the **Main Control Panel**:
    I. The **Primary Blower and Secondary Blower** will purge the system for 2 minutes.
    II. The **Secondary Burner** will purge for safety, and upon completion will ignite.
    III. Once the **Secondary Chamber** temperature reaches 1000°C, the **Primary Burner** on both Primary Chambers will purge for safety and upon completion will ignite.

IV. The burn time will start counting down when the temperature in the **Primary Chamber** reaches 427°C.

NOTE

The Main Control Panel System will maintain proper operating conditions and will provide continuous monitoring capability

After the burn cycle is completed the system will enter the cool-down cycle when the following things will occur:

- Primary Chamber & Secondary Chamber burners OFF
- Secondary Chamber Blower OFF
- Primary Modutrol 100% open
- Primary Blower ON

Once fully cooled and the temperature is below 90°C, proceed to the **Primary Chamber Clean Out Procedures**.

Primary Chamber Clean Out Procedures

Operators responsible for loading and cleaning out incinerators should wear appropriate protective equipment, including eye protection, dust masks, heavy gloves and safety shoes with puncture-proof toes and soles to avoid injury.

Although the ash from the system is considered sterile and will not contain microorganisms, it may contain a quantity of sharp objects, such as broken glass and other sharps which may not be fully destroyed in the burning process, and may thus still pose a hazard to persons who clean out the ash and residues. Also removing the ash does create dust particles in the air. Dust should not be inhaled. The operator must wear dust protection safety gear.

Please follow these steps when the cycle is complete:

1. When the internal temperature of the **Primary Chamber** has cooled to less than 40°C, lock out the power to the system on the **Main Control Panel** by moving the main disconnect to the “OFF” position.
2. Unlock all door latches on the access door to the **Primary Chamber.**
3. While standing in front of the **Primary Chamber** door, slowly open the door to allow clear entry. Secure **Primary Chamber** Door in the OPEN position.
4. With the **Primary Chamber** Door secured in the open position, raise the lid to fully opened
5. Clean the **Primary Chamber** by using ash handling tool(s) and proper safety equipment (not provided).
6. Inspect the interior of the **Primary Chamber** for wear and inspect around the door seals to ensure the door will maintain a tight seal upon closure.
7. Check the air inlet holes and remove any obstructions if necessary.

8. Inspect the door seals to ensure there are no gaps between the door gasket and the door jamb.
9. Close the **Primary Chamber** access door by clamping each latch until it is tight.
10. Clean the inspection **View Port** (glass) with a mild soap and water. To clean the view port, unscrew it by hand and re-tighten by hand.

In Case of Emergency

1. Go to manual Slide Gates on the **Primary Chamber**, located just after the blower and close them all the way. This will help to put the fire in the **Primary Chamber** out.
2. Check alarms to see what the problem is.
3. Do not open the door of the **Primary Chamber** unless the temperature inside the chamber is below 90^{o}C.
4. Call a certified technician to fix the problem and/or consult with **Eco Waste Solutions Customer Service Department at 905.634.7022, toll free 1-866-326-2876.**

Start Up After Power Failure

1. Once the power is restored turn breaker (main disconnect) back on.
2. The **Human Machine Interface (HMI)** and PLC will begin a boot up procedure.
3. Wait until the **Human Machine Interface (HMI)** on the **Main Control Panel** has booted up before turning the control power to the panel back on by pressing the Control Power ON button.
4. When the power is restored to the **Main Control Panel**, the button should illuminate.
5. If the system was interrupted during a burn cycle, restart the system by turning the selector switch on the main panel to the right to start the cycle . If the system was interrupted during cool-down cycle, it will resume the cycle where it left off.

Dealing with Warning and Faults

Troubleshooting

The burn cycle will not start if one of the following conditions exists:

1. The system is in the "cool-down" part of the cycle. Wait until the "cool down" cycle is complete.

2. There is a fault in the system as indicated on the **HMI**

3. Loss of power due to any one or more of the following:

    - The main disconnect (see image) is off or there is no electrical power. Turn on the disconnect switch or check why there is no power.

Power is OFF in this position

Power is ON in this position

- An open breaker. Check the breakers and replace any that are defective.

- The EMERGENCY STOP is pushed in. Twist the EMERGENCY STOP button to unlock, and then push the CONTROL POWER ON button. The CONTROL POWER BUTTON should now be illuminated.

4. If on the Main Control Panel HMI the **Primary Chamber** door is not closed, the door has not been shut properly. Adjust the limit switch lever arm if necessary. Check the limit switch and that the wiring is in working order.

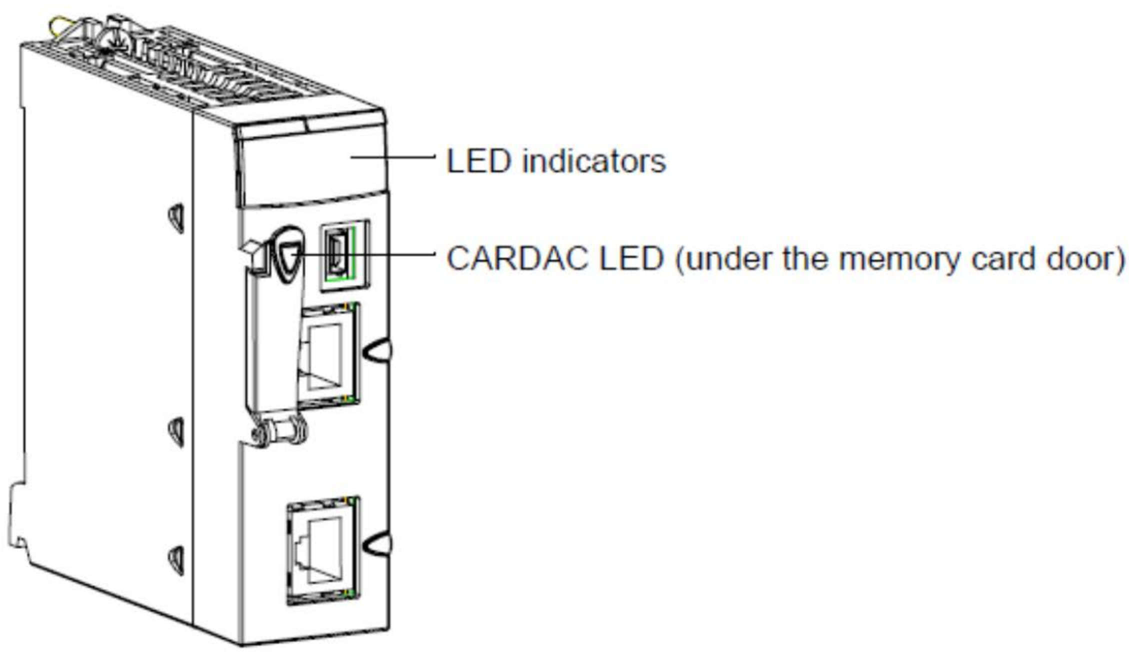
5. If on the Main Control Panel HMI the **Primary Chamber** roof lid is not closed, the lid has not been shut properly. Adjust the limit switch lever arm if necessary. Check the limit switch and that the wiring is in working order.

6. If on the Main Control Panel HMI the **Secondary Chamber** door is not closed, the door has not been shut properly. Adjust the limit switch lever arm, if necessary. Check the limit switch and that the wiring is in working order.

7. If fuel tank is low, system will not start. Tank on the **HMI** will be red, indicating the level is low and needs to be filled.

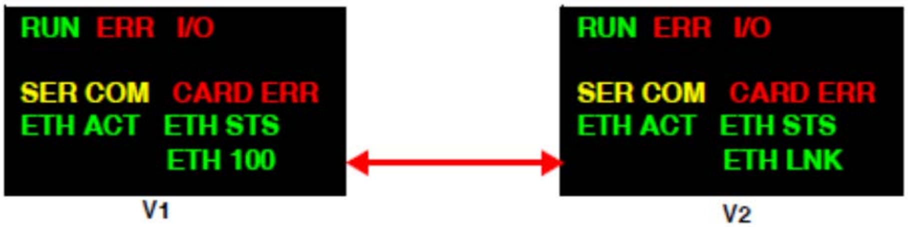
PLC Processor Problem

There are several LEDs available on the front panel of each Modicon M340 module or processor, enabling rapid diagnosis of the PLC status:



These LEDs provide information on:
- PLC functioning
- the memory card
- communication with the modules
- serial communication
- communication on the CANopen network
- communication on the Ethernet network

The following diagram shows the diagnostic LEDs on the BMX P34 2020 processor. Note that two displays exist, depending on whether you are using firmware V1 or V2 (or greater) of the processor.



The colors and blink patterns of the LEDs indicate the status and operating conditions of Ethernet communications on the module:

Label	Pattern	Indication
RUN (green): operational state	on	• PLC hardware and PLC program operations are normal. • Module is in RUN state.
	flashing	• PLC is in STOP mode or a blocking error in the application has been detected. • Processor is configured but not in RUN state.
	off	PLC is not configured (application is absent, invalid, or incompatible).
ERR (red): detected error	on	Processor, system, or configuration detected error
	flashing	• PLC is not configured (application is absent, invalid, or incompatible). • PLC is in STOP mode or a blocking error in the application has been detected.
	off	Normal (no detected errors)
ETH STS (green): Ethernet communication status	on	Communication OK
	2 flashes	Invalid MAC address
	3 flashes	Link not connected
	4 flashes	Duplicate IP address
	5 flashes	Waiting for a server IP address
	6 flashes	Secure and safe mode (with default IP address)
	7 flashes	Configuration conflict between rotary switches and internal configuration
CARDERR (red): memory card detected error	on	• Memory card is missing. • Memory card not usable (bad format, unrecognized type). • Memory card content is inconsistent with internal RAM application.
	off	• Memory card is valid and recognized. • Application on card is consistent with the internal RAM application.
I/O (red): input/output status	on	• Error detected on a configured module or CPU channel • Configuration mismatch with the application (module missing...)
	off	Normal (no detected errors)

SER COM (yellow): serial data status	flashing	Data exchange (send/receive) on the serial connection in progress
	off	No data exchange on the serial connection
CAN RUN (green): CANopen operations	on	CANopen network operational
	rapid flashing (note 1)	Automatic detection of data flow or LSS services in progress (alternates with CAN ERR).
	slow flashing (note 2)	CANopen network is pre-operational.
	1 flash	CANopen network is stopped.
	3 flashes	Downloading CANopen firmware.
CAN ERR (red): CANopen detected error	on	CANopen bus is stopped.
	rapid flashing (note 1)	Automatic detection of data flow or LSS services in progress (alternates with CAN RUN).
	slow flashing (note 2)	CANopen configuration is not valid.
	1 flash	At least one error counter has reached or exceeded alert level.
	2 flashes	A guard event (NMT slave or NMT master) or a heartbeat event has occurred.
	3 flashes	The SYNC message was not received before the end of the communication cycle period.
	off	No error detected on CANopen.
CARDAC (green): memory card access **Note:** This LED is located under the memory card door (see *The Module, p. 20*).	on	Access to the card is enabled.
	flashing	Activity on the card: during each access, the card LED is set to OFF, then back to ON.
	off	Access to the card is disabled. You can remove the card after you disable card access by setting system bit %S65 to 0.
Note 1: Rapid flashing is defined as ON for 50 ms and OFF for 50 ms.		

Note 2: Slow flashing is defined as ON for 200 ms and OFF for 200 ms.

The following table describes the meaning of the ETH ACT and ETH 100 LEDs on the front panel for firmware V1 NOE and CPU modules.

Label	**Pattern**	**Indication**
ETH ACT (green): Ethernet communication (transmission/ reception activity)	on	Ethernet link detected: no communications activity.
	off	No Ethernet link detected.
	flashing	Ethernet link detected: receiving or sending packets.
ETH 100 (green): Ethernet transmission speed	on	Ethernet transmission at 100 Mbit/s (Fast Ethernet).
	off	Ethernet transmission at 10 Mbit/s (Ethernet) or no link detected.

The following table describes the meaning of the ETH ACT and ETH LNK LEDs on the front panel for firmware V2 NOE and CPU modules.

Label	Pattern	Indication
ETH ACT (green): Ethernet communication (transmission/ reception) activity	on	Communications activity detected.
	off	No communications activity detected.
ETH LNK (green): Ethernet link status	on	Ethernet link detected.
	off	No Ethernet link detected.

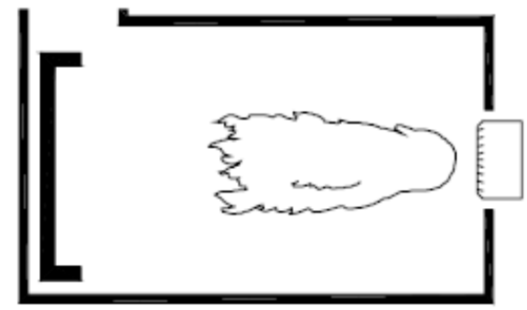
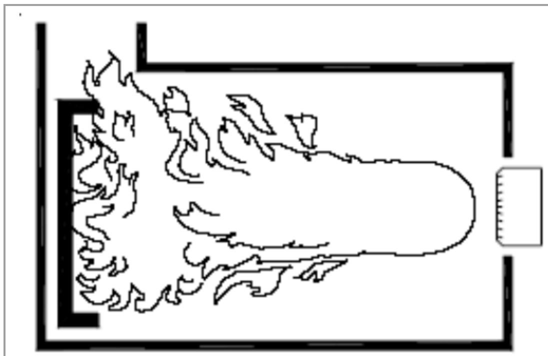
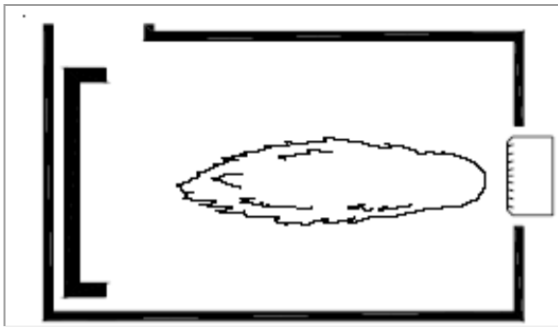
Note:

- Rapid flashing is defined as ON for 50 ms and OFF for 50 ms.
- Slow flashing is defined as ON for 200 ms and OFF for 200 ms.

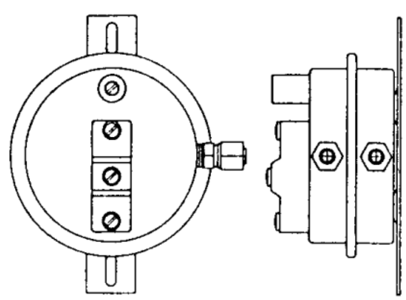
Possible Problems, Causes and Solutions

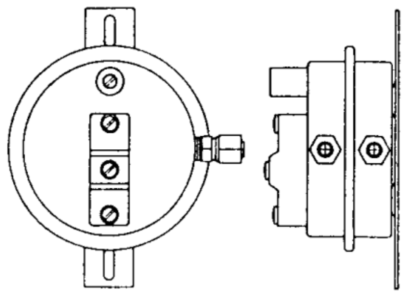
Problem	**Causes**	**Solutions**
Blower Fails to start	Over load tripped, blown fuse	Turn power off. Open Panel and reset overload. Check fuse and replace.
	Motor starters or contactor coil is burnt out	Locate contactor for Blower and visually observe if the contactor is pulled in. Use a volt meter to check for voltage across the coil If there is voltage across the coil and the contactor is not pulled in, replace the contactor.
Secondary Burner won't ignite	Bad Electrodes	Refer to Section 6 of this manual.
	Low Oil Pressure	Adjust pressure setting on burner pump. Refer to Riello Manual in Section 10.
	Fuel Line Leak	Visually inspect the lines for the leak. Tighten any fittings that are near the leak.
	Door Switch not making contact Burner alarm has been tripped	Make sure main door is closed and latched shut. Make sure limit switch is hitting striker plate.
	Bad Thermocouple	Replace thermocouple .
Primary Burner won't ignite	Bad Electrode	Refer to Section 6 of this manual.
	Low Oil Pressure	Adjust pressure setting on burner pump. Refer to Riello Manual in Section 8.
	Fuel Line Leak	Visually inspect the lines for the leak. Tighten any fittings that are near the leak.
	Door Switch not making contact or broken	Make sure main door is closed and latched shut. Make sure limit switch is hitting striker plate.
	Secondary temperature not at 1000°C	Wait until Secondary temperature is at 1000°C and try again.
	Burner main switch is turned off	Turn switch on.
	Burner alarm has been tripped	Acknowledge burn alarm and then hit the reset button on control panel.

Problem	Causes	Solutions
Persistent Black Smoke	Insufficient air supply to Secondary Chamber to completely consume emissions	Check to ensure combustion air blower/damper assembly is operating properly.
	Secondary Chamber is not hot enough.	Check that the Secondary temperature is operating at required temperature set point.
	Secondary Chamber is not hot enough.	Too much draft, open barometric damper.
	Overloading or loading highly volatile material	Decrease load size on next batch (confirm by weighing), ensure the waste mix is correct.
	Burner failure	Check burner operation – if no flame or a poor flame is visible through the flame view port adjust air/fuel ratio.
	Operating at a too high Primary Chamber temperature	Check/decrease primary chamber combustion air.
Smoke coming out of Primary	Too much air	Check dampers on primary blower.
	Too much volatile material loaded	Decrease load size on next batch to ensure the waste mix is correct.
	Primary Chamber temperature too high	Waste loaded may not be a good mix of heat value.
	Low draft	Close barometric damper on stack's T-section
Too much fuel usage	Too much secondary combustion air	Check/reduce secondary combustion air.
	Too much air infiltration	Reduce air flow by adjusting the damper.
	Fuel leakage	Check fuel trains and burners for fuel leakage.
	Wet waste	Spread wet waste with other waste through several loads – do not charge all of the wet waste at one time.
	Excessive draft	Check/reduce draft – check door seals and other seals for leakage adjust damper.
	Burner setting too high	Check air/fuel mix.

Problem	Causes	Solutions
		Correct Maximum Flame Adjustment (Proper Oil and Air Pressure with correct supply of combustion air)
		Incorrect Flame Adjustment (Not enough Combustion Air)
		Incorrect Flame Adjustment (Air Pressure too high; too much air)
Incomplete burnout/poor ash quality	Build-up around air holes – clogged with ash from previous burn	Check around air holes and clean.
	Poor draft	Draft should be -0.2-0.06 KPa (or 0.8-0.25" W.C).
	Too much wet waste – overloading system	Spread wet waste with other waste through several loads – do not charge all of the wet waste at one time.
	Insufficient burn time	Allow longer burn time period.

Possible Alarms (Faults)

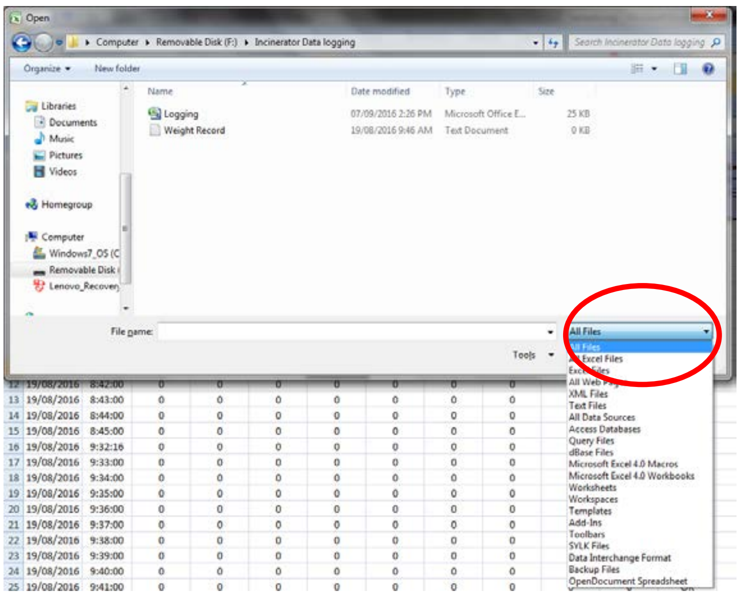
#	ALARM (System Fault)	SOLUTION
1	The Primary Chamber top/bottom thermocouple is faulted	Refer to Section 6 of this manual for corrective maintenance procedures.
2	The Secondary Chamber thermocouple is faulted	Refer to Section 6 of this manual for corrective maintenance procedures.
3	The Secondary Stack Thermocouple is faulted	Refer to Section 6 of this manual for corrective maintenance procedures.
4	The primary burner is faulted	The primary burner has failed to light when it received a signal to start. To reset the burner, press the reset button located on the Burner. If this does not start the burner, refer to Supplier Catalogue (Riello Burner) in Section 8
5	The secondary burner is faulted	The secondary burner has failed to light when it received a signal to start. To reset the burner,
6	The system has shut down due to primary blower low air flow. 	Visually examine the primary blower for any obstructions that may be causing low air flow. Check slide gate located between Primary chamber and blower, ensure it is open. Check damper assembly, ensuring modutrol crank arm is still connected and that butterfly damper is open, allowing air flow. Air proving switch may be defective. Refer to Section 6 of this manual. There are two ports on the air flow switch marked V and P. Ensure the inlet tube is attached to the port marked “P” for pressure. V stands for vacuum. Ensure the “V” port is open to atmosphere and is not blocked. If no air restriction is observed (i.e. blockage in the tube) change the air proving switch. Refer to Section 6 of this manual.
7	The primary blower motor overload is tripped.	Turn power off on Control panel by turning the Main Disconnect to the OFF position. Reset overload.

#	ALARM (System Fault)	SOLUTION
8	The system has shut down due to secondary blower low air flow 	Visually examine the Secondary Blower for any obstructions that may be causing low air flow. . Check slide gate located between Secondary chamber and blower, ensure it is open. Check damper assembly, ensuring Modutrol crank arm is still connected and that butterfly damper is open, allowing air flow. Air flow switch may be defective. Refer to Section 6 of this manual. There are two ports on the air flow switch marked V and P. Ensure the inlet tube is attached to the port marked "P" for pressure. V stands for vacuum. Ensure the "V" port is open to atmosphere and is not blocked. If no air restriction is observed (i.e. blockage in the tube) change the air proving switch. Refer to Section 6 of this manual.
9	The Secondary blower variable frequency drive is faulted	Push fault reset button on the HMI If fault persist check the error code on the variable frequency drive and check manual for troubleshooting alarm.
10	The burner fuel level is low.	Add fuel to the fuel tank and the alarm should reset itself. If alarm persists, replace the low level switch.
11	Primary Chamber – lid lifter hydraulic pump overload.	Turn power off on Control panel by turning the Main Disconnect to the OFF position. Reset overload.
12	Primary Chamber – lid lifter stuck while rising.	Check to see if anything is blocking the lifts or roof from raising Check the power pack fluid level to ensure enough hydraulic oil is available Check the limit switch is working

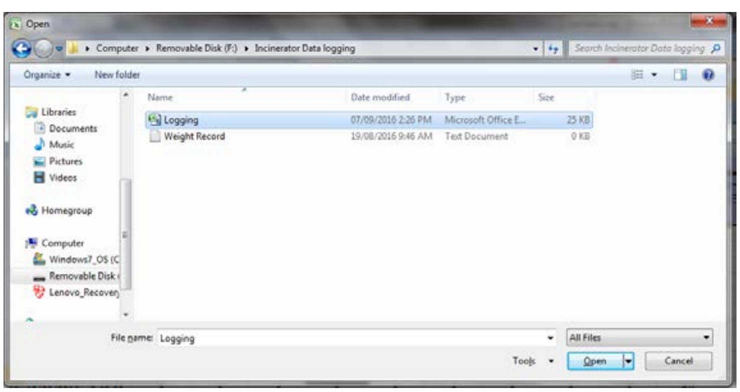
#	ALARM (System Fault)	SOLUTION
13	Primary Chamber - lid lifter stuck while lowering.	Check to see if anything is blocking the lifts or roof from lowering Check the power pack fluid level to ensure enough hydraulic oil is available Check the limit switch is working This can be caused by a burnt out solenoid valve. Check that the control valve is open.
14	Primary Chamber - lid lifter left or right safety pawl failed to retract.	Check the proximity switch that senses that the safety catch is out Check the solenoid valves (located on each column)

Accessing Historical Information

1. It is recommended that a dedicated folder be set on the destination computer that is used for storing data from the Incinerator Package (e.g. “Incinerator Data”)
2. Turn power off to the Main Control panel by turning the Main Disconnect to the OFF position.
3. Open the Main Control Panel door and remove the USB from the back of the HMI panel and insert the USB into the destination computer.
4. Open an Excel File, once opened go to File/Open locate the USB on your computer, in the bottom right corner choose “All Files”.

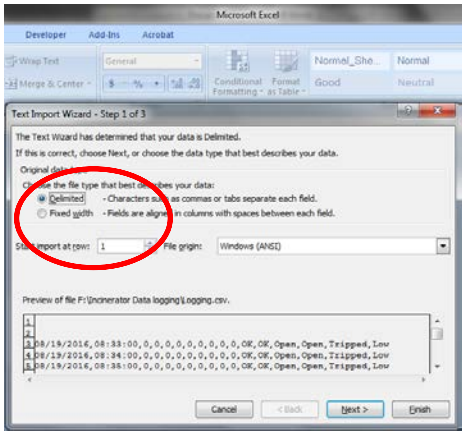


5. Click on the “logging” file and press open.

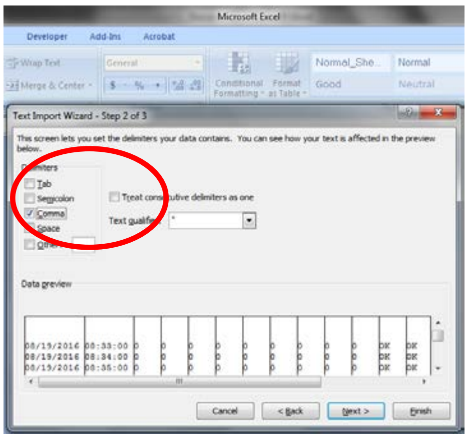


6. Excel will prompt you with a text import wizard, follow the next 3 steps to ensure the log files is displayed properly:

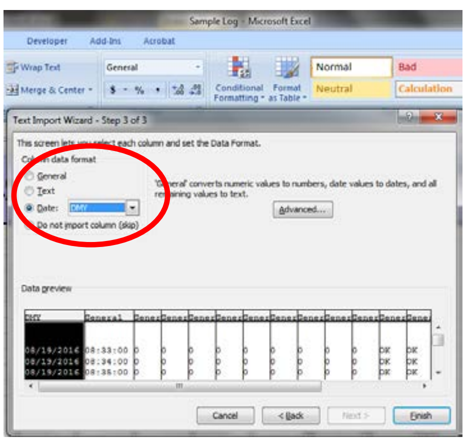
7. Steps 1 of 3 choose delimited – character such as commas or tabs separate each field, and choose Next:



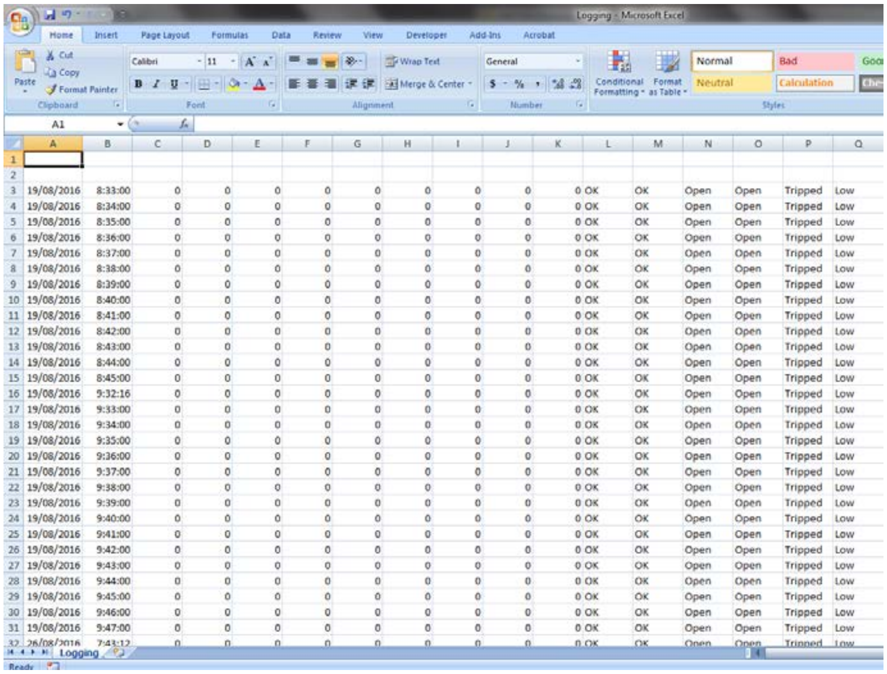
8. Steps 2 of 3 choose Comma as the delimiting item, and choose Next:



9. Steps 3 of 3 Column data format should be Date with DMY – character such as commas or tabs separate each field, choose Finish.

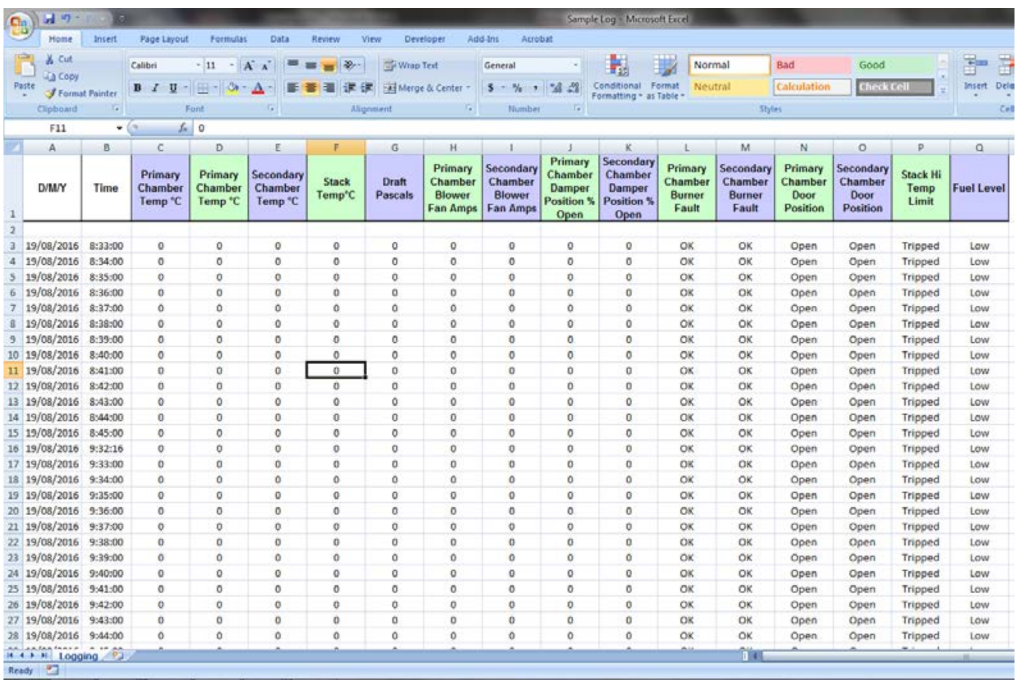


10. Once the data is open, it will look similar to the following:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
2																	
3	19/08/2016	8:33:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
4	19/08/2016	8:34:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
5	19/08/2016	8:35:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
6	19/08/2016	8:36:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
7	19/08/2016	8:37:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
8	19/08/2016	8:38:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
9	19/08/2016	8:39:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
10	19/08/2016	8:40:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
11	19/08/2016	8:41:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
12	19/08/2016	8:42:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
13	19/08/2016	8:43:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
14	19/08/2016	8:44:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
15	19/08/2016	8:45:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
16	19/08/2016	9:32:16	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
17	19/08/2016	9:33:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
18	19/08/2016	9:34:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
19	19/08/2016	9:35:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
20	19/08/2016	9:36:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
21	19/08/2016	9:37:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
22	19/08/2016	9:38:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
23	19/08/2016	9:39:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
24	19/08/2016	9:40:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
25	19/08/2016	9:41:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
26	19/08/2016	9:42:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
27	19/08/2016	9:43:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
28	19/08/2016	9:44:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
29	19/08/2016	9:45:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
30	19/08/2016	9:46:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
31	19/08/2016	9:47:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
32	26/08/2016	7:43:12	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low

11. From the electronic template file located on the USB for the manual copy the first row and paste into your log file:



	D/M/Y	Time	Primary Chamber Temp °C	Primary Chamber Temp °C	Secondary Chamber Temp °C	Stack Temp°C	Draft Pascals	Primary Chamber Blower Fan Amps	Secondary Chamber Blower Fan Amps	Primary Chamber Damper Position % Open	Secondary Chamber Damper Position % Open	Primary Chamber Burner Fault	Secondary Chamber Burner Fault	Primary Chamber Door Position	Secondary Chamber Door Position	Stack Hi Temp Limit	Fuel Level
2																	
3	19/08/2016	8:33:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
4	19/08/2016	8:34:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
5	19/08/2016	8:35:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
6	19/08/2016	8:36:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
7	19/08/2016	8:37:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
8	19/08/2016	8:38:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
9	19/08/2016	8:39:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
10	19/08/2016	8:40:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
11	19/08/2016	8:41:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
12	19/08/2016	8:42:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
13	19/08/2016	8:43:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
14	19/08/2016	8:44:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
15	19/08/2016	8:45:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
16	19/08/2016	9:32:16	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
17	19/08/2016	9:33:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
18	19/08/2016	9:34:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
19	19/08/2016	9:35:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
20	19/08/2016	9:36:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
21	19/08/2016	9:37:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
22	19/08/2016	9:38:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
23	19/08/2016	9:39:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
24	19/08/2016	9:40:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
25	19/08/2016	9:41:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
26	19/08/2016	9:42:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
27	19/08/2016	9:43:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low
28	19/08/2016	9:44:00	0	0	0	0	0	0	0	0	0	OK	OK	Open	Open	Tripped	Low

12. Save your excel file with the date in the designated folder.

13. Reinstall the USB to the back of the HMI, close the Main Control Panel door and turn power back on to the system.

SECTION 6

MAINTENANCE INSTRUCTIONS

Zero Mechanical State & Lock Out Procedures

Proper maintenance of the equipment is essential to ensure long term, reliable operation of the EWS Incinerator.

NOTE The warranty will become void if proper maintenance is not performed as instructed.

Safety

During maintenance of the EWS mobile incinerator, it is very important to be aware of special hazards. Two safety programs are described in the following sections:

1. Zero Mechanical State
2. Power Lock Out Procedures

Failure to comply with these instructions during maintenance could result in injury or death. The responsibility for implementation of a comprehensive safety program rests with the operating staff and supervision. The safety procedures in this *Manual* should be considered only as a starting point for the safety program at site.

ACCIDENTS CAN BE PREVENTED A CAREFUL WORKER IS THE BEST SAFETY DEVICE

Zero Mechanical State

Zero Mechanical State (ZMS) exists when the possibility of an unexpected mechanical movement has been eliminated. During maintenance, it is absolutely mandatory to totally deactivate the incinerator so that there is no possibility of an unexpected machine movement. Power lock-out, described in the next section, is commonly used for this purpose. Most machines are powered by electrical, hydraulic or pneumatic drives. Energy may be stored in a shutdown machine in various ways: Air pressure in a cylinder, hydraulic pressure fluid stored in pressurized hoses, or machine members whose weight can generate fluid pressure. Therefore, just cutting off the electrical power may not be enough to neutralize all power sources. Certain maintenance procedures at site should require ZMS condition as a matter of course.

Zero Mechanical State (ZMS) Checklist:

1. Every electrical power source to the incinerator must be cut off and locked out (to prevent others who may not be aware of maintenance work from turning the power back on inadvertently).
2. Ensure that the mechanical potential energy of the incinerator is at its lowest practical value so that opening of pipe, tubing, hose or actuation of any valve will not produce an unexpected movement that could cause injury.

3. Check that there is no pressurized fluid (air, oil, gas or other) trapped in the incinerator lines, cylinders or other components. This will ensure that there will be no incinerator motion when a valve is actuated.

4. Secure loose or freely moving parts so that there is no possibility of accidental movement.

Power Lock Out Procedures

Unexpected operation of electrical equipment started by automatic or manual remote control may cause injuries to persons who happen to be nearby. For this reason, when repair work is to be done on motors or other electrical equipment the circuit should be opened at the switch box and the switch pad locked in the OFF position. Tag the switch with a lock out tag indicating who must be contacted before the power is turned back on again.

BECAUSE OF THE SEVERE CONSEQUENCES, INCLUDING DEATH, OF NOT PROPERLY LOCKING OUT ELECTRICITY SUPPLIES DURING MAINTENANCE, THE SUPERVISOR SHOULD ENSURE THAT THERE IS ONLY 1 KEY FOR THE LOCK USED TO LOCK OUT THE POWER SUPPLY.

For identification, locks may be color coded to indicate different crews or shifts.

The Supervisor should maintain the master key and list of key numbers, and should keep an extra key to each lock for his department. The master key should not be loaned out under any circumstances.

No matter what method is used to lock out power to electricity, strict discipline and constant supervision should be employed during any equipment maintenance work.

Power Lock Out Checklist

1. Alert the operator of the equipment.

2. Before starting the work on an engine or motor, line shaft or other power transmission equipment or power-driven machine, make sure it can not be set in motion without your knowledge.

3. Place your own padlock on the control switch, lever, or valve, even if someone has locked the control panel before you. You will not be protected unless you put your own padlock on it. (Another maintenance person could remove their lock and then someone else could start the equipment if they were not aware of maintenance work being done.)

When finished working at the end of your shift remove your own padlock. Never permit someone else to remove it for you. Be sure you are not exposing someone else to danger by removing your padlock

Instruction Classification

Each component is associated with an identification number, see table below:

System Component	Identification number
Primary Blower	01-001
Secondary Blower	02-001
Primary Burner	01-002
Secondary Burner	02-002
Refractory	05-001
Air Compressor	03-001
Thermocouple	05-002
Main Control Panel	03-010
Paint	05-003
Electrical	05-004
Limit Switch	05-005
Lid Lifters	06-001

To differentiate if the instruction is weekly, monthly, quarterly or yearly, the above identification number will be followed by a letter:

Daily: D
Weekly: W
Monthly: M
Quarterly: Q
Yearly: Y

For example**, 01-001.Q.01** Primary blower assembly quarterly instruction number 1.

i. Daily Instructions

Primary Chamber Burner: (01-002.D)

Do not store flammable or hazardous materials in the vicinity of fuel burning appliances.

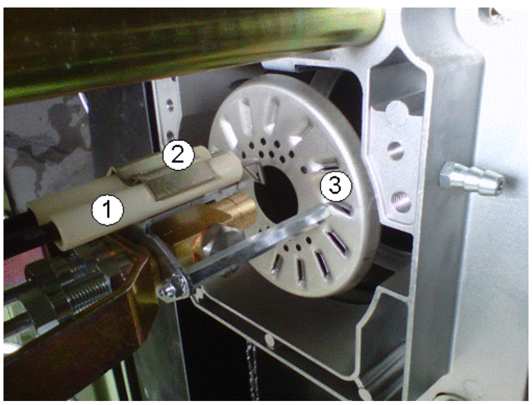
Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death.

Burner shall be installed and maintained in accordance with manufacturer's requirements as outlined in the Burner manual, local codes and authorities having jurisdiction.

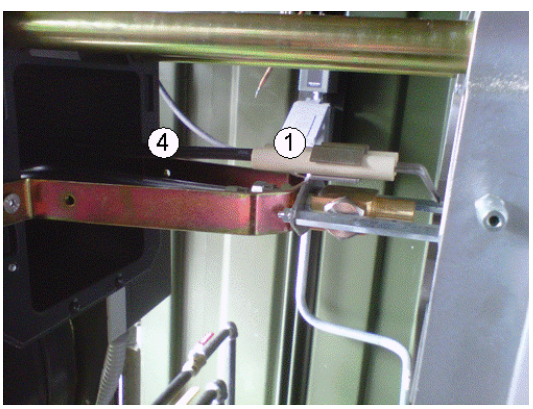
INSTRUCTION 01-002.D.01: INSPECTING AND CLEANING ELECTRODES

1. Remove the cover from the Burners as described in 01-002.W.01

2. Inspect the electrodes (PN: 3003796) for any soot build-up.



1. Electrode
2. U-bolt
3. Diffuser Disc

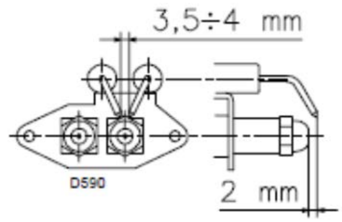


4. HT Leads

3. Clean/wipe down the ignition electrode with a cloth should there be a build-up of soot.

NOTE **Do not use sand paper as this will increase the deposit of future soot.**

4. If electrodes are damaged remove the screws and u-bolt (see above photo) and install new electrodes. When reinstalling the electrodes make sure that they are positioned as shown below.



Primary Burner

Check the High Temperature (HT) Leads (PN: 3012995) for any heat damage. If HT Leads are severely damaged (ie, you can see the wire beneath the sheathing) then replace. (See *CMI 6.3.3/01-002A)*

INSTRUCTION 01/02-002.D.02: INSPECTING THE FUEL LINES

1. Visually inspect all fuel lines to the Primary and Secondary Burner for any leaks.

2. The Primary Burner have two oil lines, one feed and one return. the Secondary Burner has only a feed line

3. If any leaks are observed tighten or replace the fitting where the leak is occurring

INSTRUCTION 01-002.D.03: INSPECT AND CLEAN BURNER NOZZLES

Primary Burner:

1. Remove the burner cover as outlined in 01/02-002.W.01 REMOVAL OF BURNER COVERS

2. Remove the centre retaining bolt.

3. Slide burner out.

4. Check nozzle. If there is carbon, remove the nozzle and clean.

5. Reinstall or replace if necessary (PN: C5222433)

Refractory: (05-001.D)

When working with the refractory make sure you use the proper tools; wear goggles, approved dust mask and gloves

INSTRUCTION 05-001.D.01: INSPECTING THE REFRACTORY

Ensure power is locked out.

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

1. Open Primary Chamber door by unlatching all four clamps.

2. Tie-off door to open position to ensure that it will not close unintentionally.

3. Enter Primary Chamber and check the refractory for shrinkage, any gap between the modules greater than 2.5 cm should be patched with the blanket refractory

4. Check for any exposed metal between the modules, if metal is exposed make sure to patch area with blanket material (PN: 1" x 24" 8# 2600) or new module (PN: 6" Mod ZR) (*CMI 6.3.2/05-001A & 6.3.2/05-001B)*

ii. Weekly Instructions

Primary & Secondary Chamber Blowers: (01-001.W & 02-001.W)

Do not attempt any maintenance on a fan unless the electrical supply has been completely disconnected and locked.

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

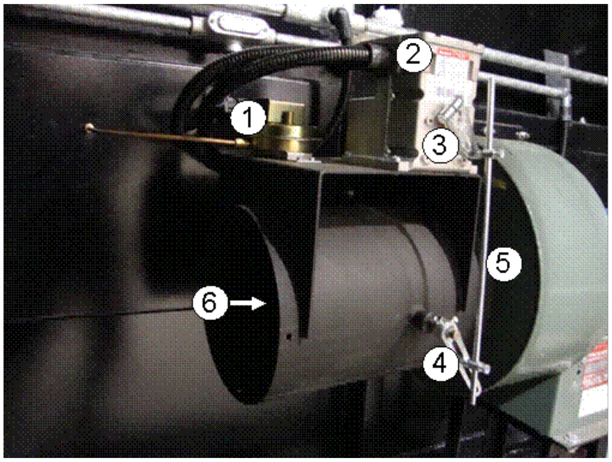
A fan can windmill despite removal of all electrical power therefore, take extra care when working with fans in the system.

The rotating assembly should be blocked securely before attempting maintenance of any kind.

INSTRUCTION 01/02-001.W.01: DAMPER CRANK ARM

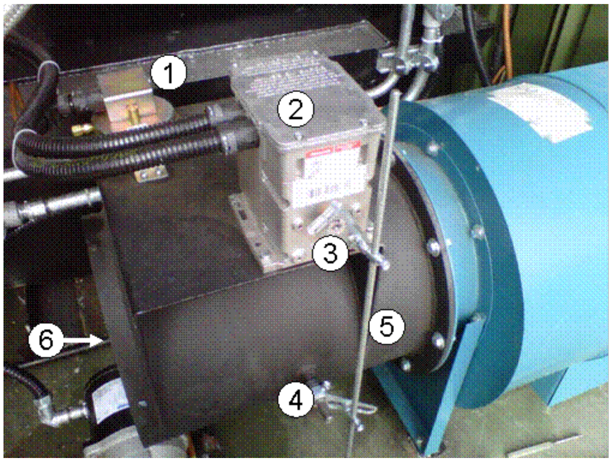
Check to see that the damper crank arm is connected to the damper and the rod.

Ensure mechanical linkage on damper is tight, if loose tighten with wrench.



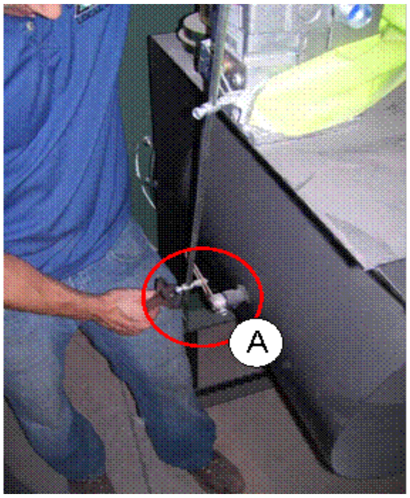
PRIMARY BLOWER

1. Air Proving Switch
2. Modutrol Motor
3. Motor Crank Arm
4. Damper Crank Arm
5. Rod
6. Damper



SECONDARY BLOWER

1. Air Proving Switch
2. Modutrol Motor
3. Motor Crank Arm
4. Damper Crank Arm
5. Rod
6. Damper



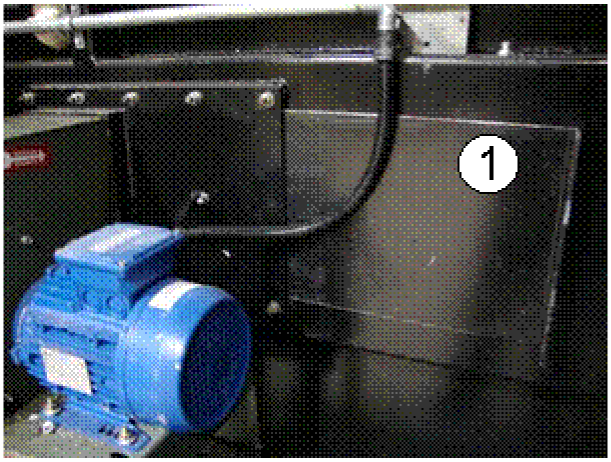
A. Damper Crank arm and connection to Damper and Rod

INSTRUCTION 01/02-001.W.02: SLIDE GATES

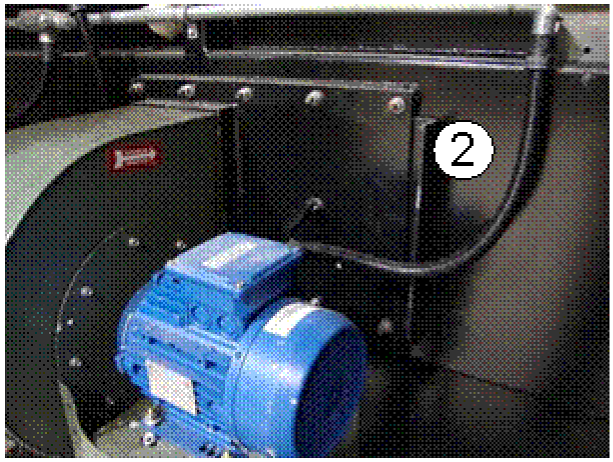
Check to see if slide gates move freely.

1. Move slide gate in and out to ensure free movement. If sticking, use lubricant to loosen. Lubricant should be rated for a high temperature (>150°F) application.

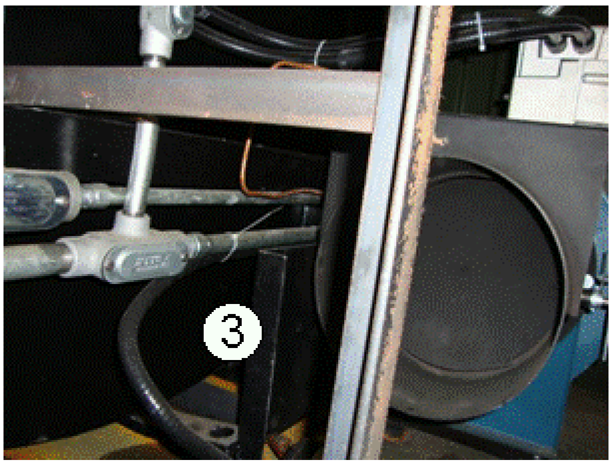
2. Gates must be opened to allow under fire air to enter the chamber. They should only be closed to reduce air in abnormal operating conditions.



1. Primary Chamber Slide Gate Open



2. Primary Chamber Slide Gate Closed



3. Secondary Chamber Slide gate Open

Primary Chamber Burner: (01-002.W)

Do not store flammable or hazardous materials in the vicinity of fuel burning appliances.

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death.

Burner shall be installed and maintained in accordance with manufacturer's requirements as outlined in the Burner manual, local codes and authorities having jurisdiction.

INSTRUCTION 01/-002.W.01: REMOVAL OF BURNER COVER

Switch off the electrical power. Please follow all instructions in *Section 6.1 Zero Mechanical State & Lock Out Instructions.* Cover must be removed to perform maintenance on the burner.

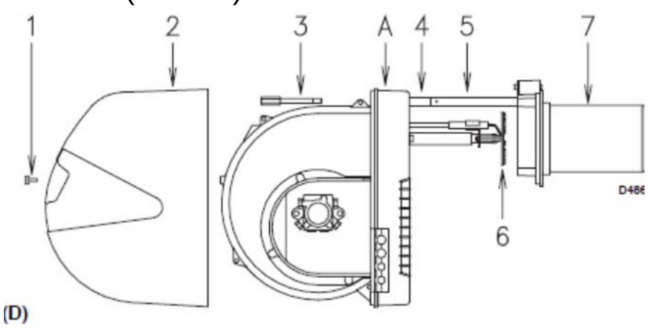
To remove the cover and to pull out the Primary or Secondary Burner, follow instructions below:

1. Loosen screw (Item #1, in the following diagrams) and withdraw the cover (Item #2, in the following diagrams)

2. Primary Burner has one screw to remove the cover. The Secondary Burner has four screws to remove the cover.

3. Remove bolt (Item #3) for the Primary Burner, or screws (Item #3) for the Secondary Burner.

4. Pull (Part A) backwards keeping it slightly raised to avoid damaging the diffuser disk (Item #6).



Primary Burner has 1 screw

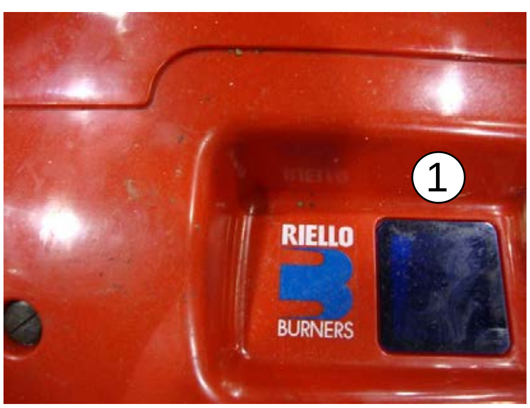
INSTRUCTION 01/02-002.W.02: CLEANING THE PHOTO ELECTRIC CELL

1. Remove the cover from the Burners as described in Instruction 01-002.W.01.
2. Clean Photo Electric (P.E) cell with a wet cloth (Primary Burner PN: 3006216)
3. P.E. cell (Item #1) can be removed by pulling it outward forcefully. Ensure you take note of the position of the eye while removing, this will help when reinstalling.
4. Once cleaned insert P.E. cell back into position ensuring the eye is not facing directly into the chamber (where the flame will be) but on the same angle as before it was removed.
5. Replace burner cover.

Primary Burner PE Cell

INSTRUCTION 01-002.W.03: CLEANING THE INSPECTION WINDOWS

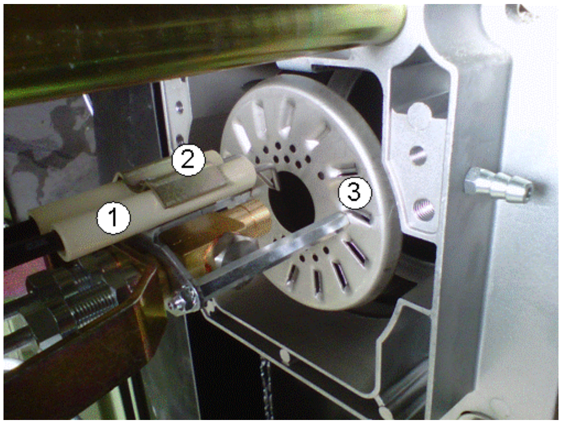
Clean the inspection windows with a wet cloth.



1. Primary Burner Inspection Window

INSTRUCTION 01-002.W.04: INSPECTING THE DIFFUSER DISC ASSEMBLY

1. Remove the cover from the Burners as described in 01-002.W.01.
2. Check the diffuser disc assembly (Primary Burner PN: 3003791) for any heat damage
3. If any heat damage, deformation or excess rust is noted, replace. (*CMI 6.3.8/03-009K)*



1. Electrode
2. U-bolt
3. **Diffuser Disc**

Secondary Chamber High Output Dual Burner: (02-002.W)

Do not store flammable or hazardous materials in the vicinity of fuel burning appliances.

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death.

Burner shall be installed and maintained in accordance with manufacturer's requirements as outlined in the Burner manual, local codes and authorities having jurisdiction.

INSTRUCTION 02-002.W.01: SECONDARY BURNER WEEEKLY ROUTINE

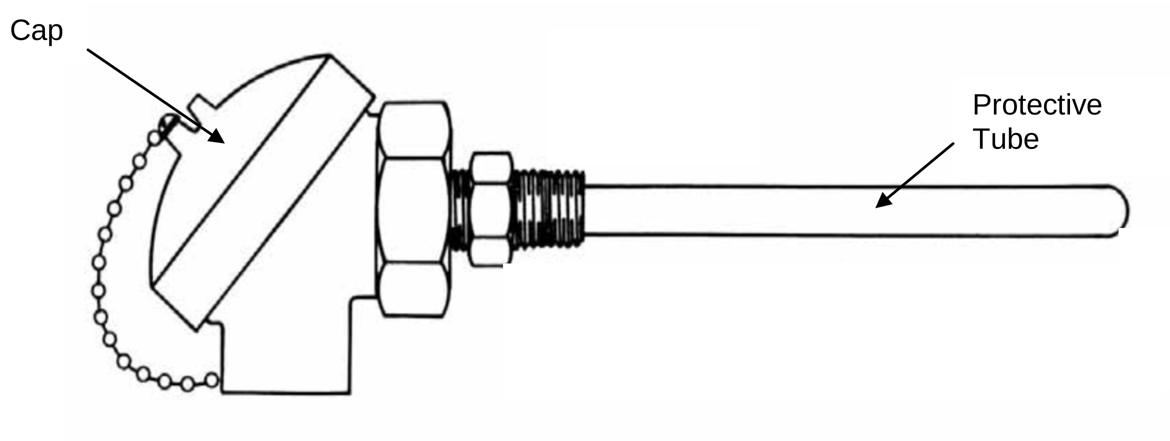
1. Clean flame sensors.
2. Clean the glass on the flame inspection window.
3. Clean spark ignitors.
4. Clean pilot assemblies.
5. Check spark ignitor lead connections.
6. Check turbulator ring.
7. Clean all filters and filter screens.
8. Lubricate all moving parts (i.e. bearings on doors, door latches & hinges, air and fuel valves, proportioning fuel valves, particularly the shafts on both air modulation valves

9. Check all motors for bearing noise, loose fans, etc.

10. Inspect fuel lines for leaks

Thermocouple: (05-002.W)

⚠ When working with electrical components ensure lock out instructions are being followed.

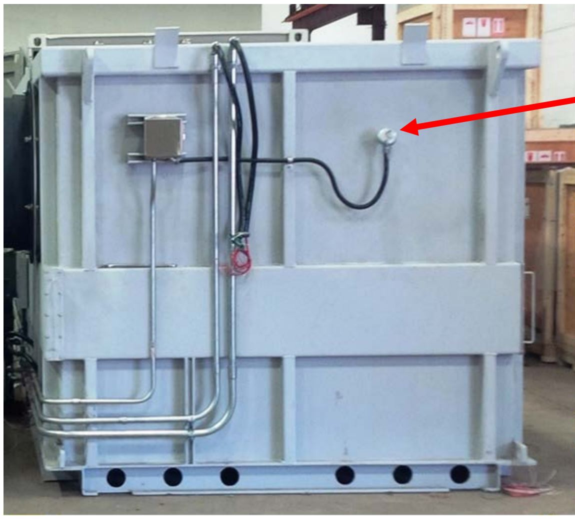


Thermocouple Assembly

Thermocouple Element

INSTRUCTION 05-002.W.01: INSPECT THERMOCOUPLE FOR DAMAGE

Turn main power to the system off - Remove thermocouple and visually inspect for damage. If damaged, see *CMI 6.3.1/05-002A*



1. Primary Chamber #1 Thermocouple

2. Two Secondary Thermocouples on Secondary Chamber body and beside the burner

3. Stack Thermocouple on Stack

i. Monthly Instructions

Primary & Secondary Chamber Blowers: (01-001.M & 02-001.M)

Do not attempt any maintenance on a fan unless the electrical supply has been completely disconnected and locked. In many cases, a fan can windmill despite removal of all electrical power. The rotating assembly should be blocked securely before attempting maintenance of any kind.

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

INSTRUCTION 01/02-001.M.01: CHECK FAN WHEEL

1. Check the fan wheel for any wear or corrosion, as either can cause catastrophic failures, if left in operation.

2. The wheel can be accessed one of two ways.
   a. Remove the blower assembly from the unit and look down the outlet of the blower.
   b. Remove the damper assembly from the inlet of the blower and inspect by looking through the inlet of the blower.

3. Check also for the build-up of material which can cause unbalance resulting in vibration, bearing wear and serious safety hazards.

4. Clean the wheel as required.

5. If replacement is necessary follow these steps:

   a. Remove damper assembly from the unit
   b. Remove the blower assembly
   c. Remove the blower housing around the wheel
   d. Loosen all set screws that are located on the wheel.
   e. A puller may be required if the wheel hasn't been removed for some time.
   f. Ensure the shaft "key" is installed on the shaft before installing the new wheel.
   g. When installing a new wheel, the wheel should be positioned in the housing with the correct spacing between the edge of the inlet cone and the wheel. The wheel to cone clearance on the Primary Blower is 0.3175 cm.
   h. Ensure that the wheel is installed securely before reassembling the blower assembly.
   i. Install the blower assembly
   j. Install the damper assembly

Primary Chamber Burner: (01-002.M)

⚠ Do not store flammable or hazardous materials in the vicinity of fuel burning appliances. Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death. Refer to the Burner manual for instructional or additional information.

INSTRUCTION 01-002.M.01: CHECK FLEXIBLE OIL LINE

1. Check flexible oil lines to make sure that they are still in good condition. This includes frayed, leaking, or worn swivel joints.

2. If any type of damage is observed replace the flexible oil lines see *CMI 6.3.3/01-002F & 6.3.3/02-0002F*

Primary Chamber Burner Flexible lines

INSTRUCTION 01-002.M.02: INSPECT BURNER PUMP DELIVERY PRESSURE

1. Remove the cover from the Burner as described in Instruction 01/02-002.W.01.

2. The pump delivery pressure must be between 180-210 psi, and can be viewed on the gauge shown below.

3. If the pressure is found to be unstable or if the pump is running noisily try the following:
    a. Detach the flexible hose from the line filter (Shown below as #1).
    b. At the tank pour fuel into the supply line.
    c. If there is fuel coming in through the filter it means the filter is not clogged. If no fuel is coming through the filter remove and replace.

Primary Chamber Burner Flexible lines

4. If the pump is found to be responsible:
    a. Loosen the bleed screw.
    b. Turn on the burner
    c. Once all the air has been bled out. Close the bleed screw.

    If the pump is still not working after these steps replace the pump.

5. If the problem lies in the suction line, check to make sure that the filter is clean and that air is not entering the piping from a loose fitting or damaged line.

INSTRUCTION 01-002.M.03: CLEAN BURNER OF DUST

1. Remove the cover from the Burners as described in Instruction 01-002.W.01.

2. Check that no dust has accumulated inside the burner fan or on fan blades.

3. If any dust is visible take a clean soft cloth to the fan or the blades and wipe clean.

INSTRUCTION 01-002.M.04: CHECK BURNER COMBUSTION HEAD

1. Remove the cover from the Burners as described in Instruction 01-002.W.01.

2. Check that all parts of the combustion head are in good condition, free of all impurities, and that no deformation has been caused by operation at high temperatures.

(Below is an example of burner in good condition)

If damage is found, please refer to *CMI 6.3.3/01-002D* & *6.3.3/02-002D*

Secondary Chamber High Output Dual Burner: (02-002.M)

Do not store flammable or hazardous materials in the vicinity of fuel burning appliances. Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death. Refer to the Burner manual for instructional or additional information.

INSTRUCTION 02-002.M.01: SECONDARY BURNER IN-LINE HEATER

1. Check all electrical connections.
2. Remove heater element from casing and inspect for build-up. Clean any deposits. When reinstalling always ensure the bundle will be restarted immersed. **NEVER** use the inline oil heater dry.

INSTRUCTION 02-002.M.02: SECONDARY BURNER SOLENOID VALVES

1. Examine solenoid valves for any deposits. Remove if necessary
2. Check electrical connections.

Refractory: (05-001.M)

When working with the refractory make sure you use the proper tools; wear goggles, dust mask and gloves

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

INSTRUCTION 05-001.M.01: INSPECT REFRACTORY

1. Ensure power is locked out.
2. Open Secondary Chamber door.
3. Fasten door open, ensuring it will not close by its own weight.
4. Enter Secondary Chamber and check the refractory for shrinkage, any gaps between the modules greater than 2.5 cm should be patched.
5. Fix gaps with supplied blanket by stuffing material into opening. (See *CMI 6.3.2/05-001A)*
6. Check for any exposed metal, if metal is exposed make sure to patch area with blanket material or new module. (See *CMI 6.3.2/05-001A* & *6.3.2/05-001B)*
7. Pay special attention to areas where the junction boxes are located, as any excessive heat may melt the wires within the box.
8. From Secondary Chamber interior look up the stack while the cap is in closed position.
9. View the surface of the bottom of the stack cap flap with a flash light
10. Some cracking is normal, however if pieces are missing or have fallen out, (See *CMI 6.3.2/05-001E)*

Lid Lifters: (06-001.M)

Controls are normally closed. Do not modify to by-pass or leave the controls open.

Always remain vigilant and avoid injury.

INSTRUCTION 06-001.M.01: CHECK HYDRAULIC FLUID

Check the level of the hydraulic fluid. Fill if necessary.

1. Always use High temperature hydraulic oil Grade 32 to fill the tank.

ii. Quarterly Instructions

Primary & Secondary Chamber Blowers: (01-001.Q & 02-001.Q)

Do not attempt any maintenance on a fan unless the electrical supply has been completely disconnected and locked. In many cases, a fan can windmill despite removal of all electrical power. The rotating assembly should be blocked securely before attempting maintenance of any kind.

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

INSTRUCTION 01/02-001.Q.01: LUBRICATE BEARINGS

1. Lubricate the bearings, but do not over lubricate.

2. Bearings are completely filled with grease at the factory; they may run at an elevated temperature during initial operation. Surface temperatures may reach 180°F and grease may bleed from the bearing seals. This is normal and no attempt should be made to replace lost grease. Bearing surface temperatures will decrease when the internal grease quantity reaches a normal operating level.

3. Bearings should be lubricated with premium quality lithium-based grease conforming to NLGI Grade 2. Examples are:

   Mobil - Mobilgrease XHP
   Texaco - Premium RB
   Chevron - Amolith #2
   Shell - Alvania #2

4. Add grease to the bearing via the grease nipple while running the fan or rotating the shaft by hand. Be sure all guards are in place if lubrication is performed while the fan is operating. Add just enough grease to cause a slight purging at the seals. Do not over lubricate.

Primary Chamber Burner: (01-002.Q)

Do not store flammable or hazardous materials in the vicinity of fuel burning appliances. Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death. Refer to the Burner manual for instructional or additional information.

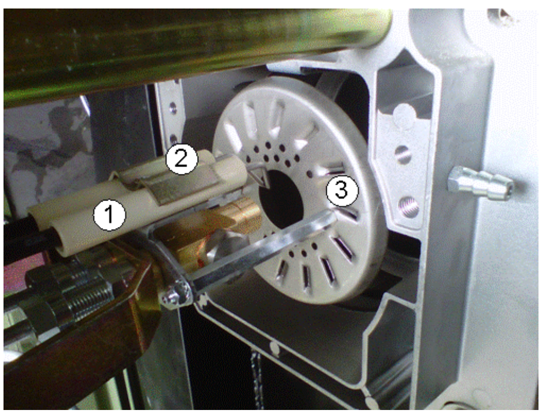
INSTRUCTION 01-002.Q.01: INSPECT COMPONENTS FOR HEAT DAMAGE

1. Check all components for heat damage.

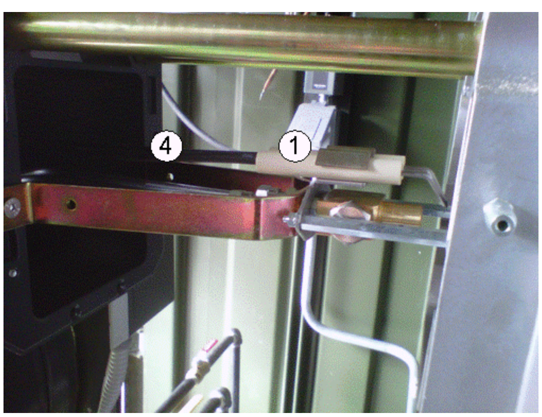
2. Look for excessive rust, deformation of all the parts including but not limited to the end cone and the diffuser disc.

3. Check to see that the High Temperature Leads (HT leads) are still intact and have not melted from any excessive heat coming back into the burner. If they are damaged replace with new HT Leads (PN: 3012995 Primary). *See CMI 6.3.3/01.002A.*

    a. The HT leads are attached to the control box and the electrode via a squeeze fitting. Remove the leads from the electrode and control box by simply pulling them out.



1. Electrode
2. U-Bolt
3. Diffuser Disc



4. HT Leads

End cone

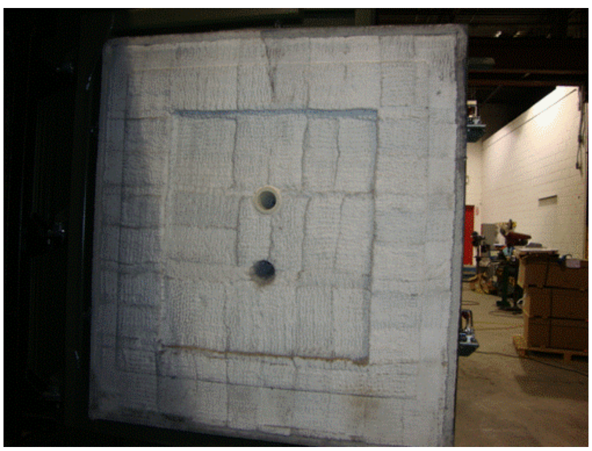
Refractory: (05-001.Q)

When working with the refractory make sure you use the proper tools; wear goggles, dust mask and gloves

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

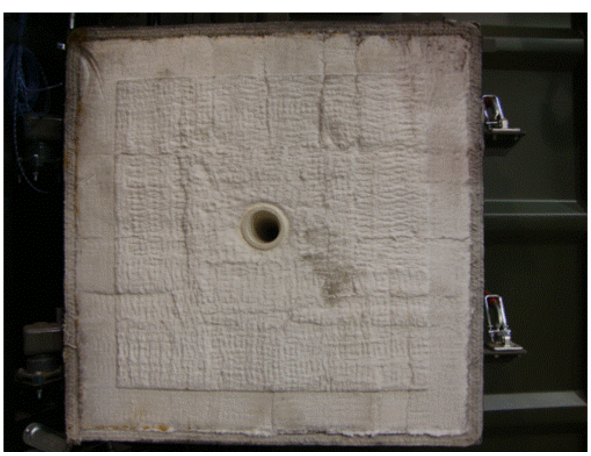
INSTRUCTION 05-001.Q.01: INSPECT DOOR GASKETS

1. Open Primary and Secondary Chamber doors.
2. Fasten doors open, ensuring the door will not close on its own.
3. Inspect door gasket for damage.
4. Replace any damaged segments of door gasket (PN: GSB 1.5") if necessary. Cut out the damaged section and replace with new door gasket. See *CMI 6.3.2/05-001C*.
5. Doors must close tightly and securely, ensuring a good seal.



Primary Door (refractory lined)

1. Primary Door Gasket



Secondary Door (refractory lined)

1. Secondary Door Gasket

INSTRUCTION 05-001.Q.02: INSPECT REFRACTORY FOR SHRINKAGE

1. Ensure power is locked out.

2. Open Primary and Secondary Chamber doors.

3. Fasten doors open, ensuring they will not close on their own.

4. Enter Primary and Secondary Chamber and check the refractory for shrinkage, anything greater than 2.54 cm should be patched.

5. Check to make sure the anchoring of the modules is still strong and intact, if any modules seem loose replace complete module with new module.

A. **REMOVAL:** Remove existing Module (physically pull away existing refractory from underlying Module Anchor).

B. Remove welded stud from steel casing (cut with hack saw or other device between Module Anchor and Furnace Casing/Shell).

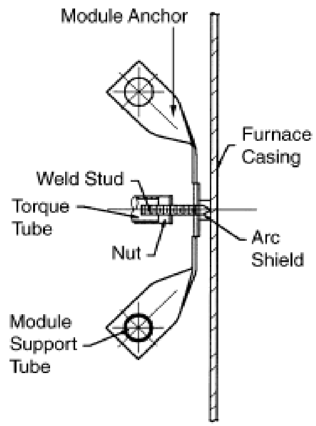


Figure 1: Side view of the Weld Loc Module

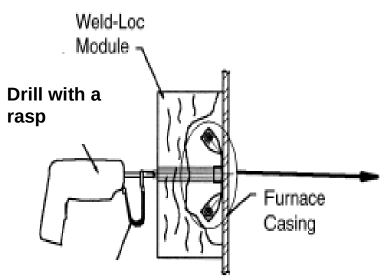


Figure 2: Stud Gun with rasp and Torque Tube.

A. **INSTALLATION**: Once the new module (PN: 433026) is in place take the stud gun (PN: ECO-STUD) with rasp to the Torque Tube and drill into place.

B. Once it has tightened the Torque Tube should come off with the drill.

Paint: (05-003.Q)

Ensure proper ventilation and proper equipment is being used when using any paint product.

INSTRUCTION 05-003.Q.01: INSPECT AND MAINTAIN EXTERIOR PAINT

1. Maintain paint exterior to protect metal from heat and corrosion damage. This includes all components in the system including containers and incinerator components.

2. If discoloration is noted and painting needs to be performed, on areas where paint will be applied, you must do a light sanding before application.

3. Follow paint manufacturer's application instructions which will include surface preparation, priming and painting.

4. If components within the container need to be painted, for example the Primary Chamber or the Secondary Chamber, proceed as above. Use a type of paint that meets the following specifications:

Paint Specifications:

Incinerator Paint: This is the paint coated directly on the incinerator shell. This includes the following components:

1. Primary Chamber
2. Secondary Chamber
3. Breech Section
4. Hot Stack Section (Black)

Finish needs to be able to withstand temperatures in the 650-750°F (340-400°C) range.

Parts: There are no paint specifications for each individual component. This is left up to the discretion of the customer.

iii. Yearly Instructions

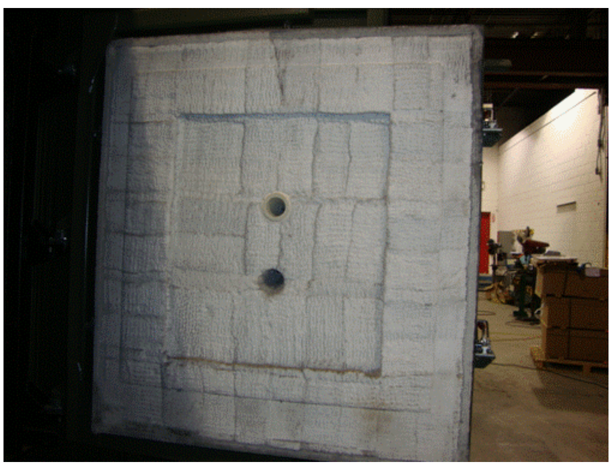
Refractory: (05-001.Y)

When working with the refractory make sure you use the proper tools; wear goggles, dust mask and gloves

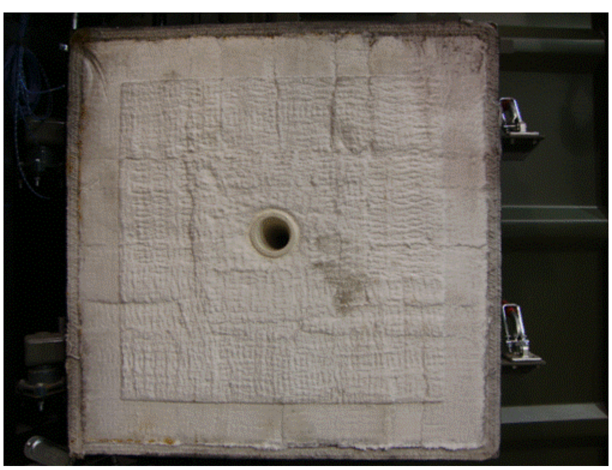
INSTRUCTION 05-001.Y.01:
CHECK DOOR GASKET ALONG PRIMARY & SECONDARY CHAMBER DOORS

1. If required replace the door gasket. The gasket can last over 2 years but will depend on the careful use by the operator when loading and unloading.

2. Remove the damaged section of door gasket from door and reinstall new gasket (PN: GSB 1.5")


Primary Door (refractory lined)

Primary Door Gasket


Secondary Door (refractory lined)

Secondary Door Gasket

Electrical: (05-004.Y)

When working with electrical components ensure lock out instructions are being followed

Please follow all instructions outlined in *Section 6.1 Zero Mechanical State & Lock Out Instructions.*

INSTRUCTION 05-004.Y.01: CHECK LIMIT SWITCHES

NOTA System must not be running or in cool down to perform this inspection.

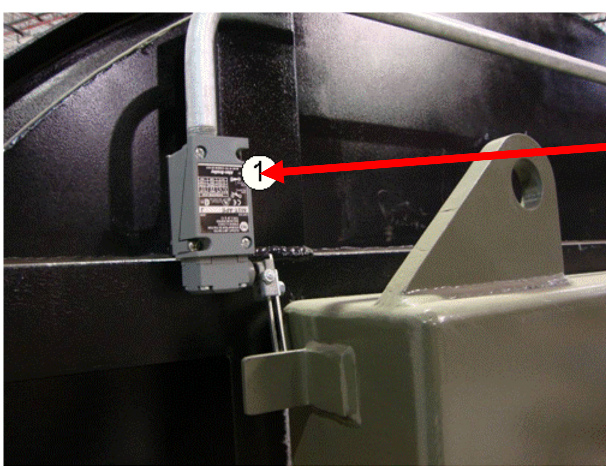
1. Open Primary and Secondary Chamber doors and check top view screen on the HMI to ensure that it indicates door is open.

2. Close Primary and Secondary Chamber doors and check top view screen on the HMI to ensure that it indicates door is open.

3. All limit switches located on the unit are checked this way.

4. Replace limit switches (PN: 802T-APE) if necessary.

Primary Chamber Limit Switch



Secondary Chamber Limit Switch

1. See *CMI 6.3.1/05-005A)*.

2. Check all other limit switches in the system.

    a. Limit Switch located at upper limit of lid lifter Primary Chamber
    b. Limit Switch located at lower limit of lid lifter Primary Chamber

CORRECTIVE MAINTENANCE INSTRUCTIONS (CMI)

The following instructions relate to the replacement or correction (fixing) of components of the EWS Incinerator Package.

These Corrective Instructions are grouped in this section by the following:

- 6.3.1 General Corrective Maintenance Instructions
- 6.3.2 Refractory Corrective Maintenance Instructions
- 6.3.3 Primary & Secondary Burner Corrective Maintenance Instructions
- 6.3.4 Primary & Secondary Blower Corrective Maintenance Instructions
- 6.3.5 Waste Oil Burner Corrective Maintenance Instructions
- 6.3.6 Main Control Panel Corrective Maintenance Instructions

the following table is utilized to identify the components of the system that require corrective maintenance.

System Component		Identification number	
Primary Blower		**01-001**	
	Air Proving Switch Replacement		6.3.4/01-001A
	Damper Calibration		6.3.4/01-001B
	Modutrol Resistor Replacement		6.3.4/01-001C
	Damper Crank Arm Replacement		6.3.4/01-001D
	Motor Replacement		6.3.4/01-001E
	Modutrol Motor & Transformer Replacement		6.3.4/01-001F
Secondary Blower		**02-001**	
	Air Proving Switch Replacement		6.3.4/02-001A
	Damper Calibration		6.3.4/02-001B
	Modutrol Resistor Replacement		6.3.4/02-001C
	Damper Crank Arm Replacement		6.3.4/02-001D
	Motor Replacement		6.3.4/02-001E
	Modutrol Motor & Transformer Replacement		6.3.4/02-001F
Primary Burner		**01-002**	
	Replacing Fuel Filter		6.3.1/01-002A
	HT Lead & Electrode Replacement		6.3.3/01-002A
	Diffuser Disc Replacement		6.3.3/01-002B
	Nozzle Replacement		6.3.3/01-002C
	End Cone Replacement		6.3.3/01-002D
	Nozzle Assembly Repair or Replacement		6.3.3/01-002E
	Burner Flexible Oil Line Replacement		6.3.3/01-002F
	Low Level Switch Replacement		6.3.3/01-002G
	Inspection Window Replacement		6.3.3/01-002H
	Fuel Pump Replacement		6.3.3/01-002I
	Control Box Replacement		6.3.3/01-002J
	Oil Tube Replacement		6.3.3/01-002K
	Burner PE Cell & UV Detector Replacement		6.3.3/01-002L
	Burner Fan Motor Replacement		6.3.3/01-002M

Refractory		**05-001**	
	Wall Refractory: Gaps between the Modules		6.3.2/05-001A
	Wall Refractory: Replacement of the Modules		6.3.2/05-001B
	Door Gasket		6.3.2/05-001C
	Castable Refractory		6.3.2/05-001D
	Temporary Repair of Castable		6.3.2/05-001E
Main Control Panel		**03-010**	
	Main Control Panel		6.3.6/03-010A
	Reboot PLC		6.3.6/03-010B
Limit Switch		**05-005**	
	Limit Switch Replacement		6.3.1/05-005A

iv. General Corrective Maintenance Instructions

LIMIT SWITCH REPLACEMENT (6.3.1/05-005A)

1. Loosen the 2 screws holding the limit switch in place.
2. Remove limit switch, replace with a new one (PN: 802T-APE).
3. Take arm off of old body and mount to new.
4. Tighten the 2 screws holding the limit switch body.

REPLACING THERMOCOUPLE (6.3.1/05-002A)

The thermocouple will require routine replacement. The environment inside the incinerator will erode the protection tube to the point of failure. If the element is exposed to this environment it will be destroyed and will need to be replaced.

1. Unscrew thermocouple lid and remove wires.
2. Remove protection tube. To aid with this a vise and a pipe wrench will be needed.
3. Remove element and replace with new element (PN: TK-K08B-0100-S) and protection tube (PN: TA-A427A-K08B-010).

4. Reinstall on incinerator.

5. After installation turn power back on. Observe the temperature reading of the thermocouple you were just working on. If the wires were installed incorrectly the temperature will read the opposite temperature. (ie 20°C would read as -20°C). If this is the case open the thermocouple housing and switch the wires.

REPLACING FUEL FILTER (6.3.1/01-002A AND 02-002A)

The fuel filter will require routine replacement to ensure clean fuel delivery to the Primary and Secondary Chamber burners.

1. Close the ball valve on the supply line.

2. Unscrew the used filter. Use a bucket to catch the surplus fuel when you unscrew the filter.

3. Before installing the filter lubricate the seal on the new filter.

4. Install the new filter, and open the supply line ball valve.

v. Refractory Corrective Maintenance Instructions

When working with the refractory make sure you use the proper tools; wear goggles, dust mask and gloves

WALL REFRACTORY: GAPS BETWEEN THE MODULES (6.3.2/05-001A)

The ceramic block refractory will shrink over time exposing the exterior metal shell. These gaps need to be filled in with ceramic refractory blanket.

1. Identify gaps in the chamber that are larger than 1” in width between the modules or if you can see exterior shell.

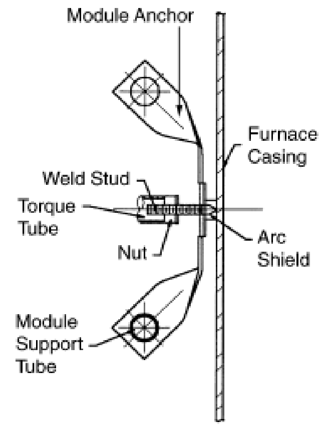
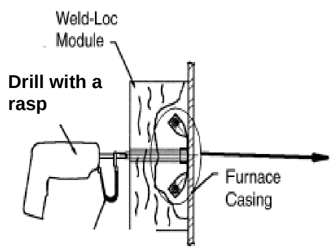
2. With a Utility knife cut a length of ceramic blanket (PN: 1" x 24" 8# 2600) that will fit in the gap between the modules.

3. Stuff the blanket into the space with a straight edge or ruler.

WALL REFRACTORY: REPLACEMENT OF MODULES (6.3.2/05-001B)

Excessive damage to a section of refractory may necessitate the replacement of modules in the incinerator. Such damage is largely due to mechanical wear. The following diagram walks through the removal and installation of new modules.

<table>
<tr>
<td>A. REMOVAL: Remove existing Module (physically pull away existing refractory from underlying Module Anchor)

B. Remove welded stud from steel casing (cut with hack saw or other device between Module Anchor and Furnace Casing/Shell)</td>
<td>Figure 1: Side view of the Weld Loc Module

</td>
</tr>
<tr>
<td>Figure 2: Stud Gun with rasp and Torque Tube (part of module assembly).

</td>
<td>C. INSTALLATION: Once the new module is in place take the stud gun (PN: Eco-Stud) with rasp to the Torque Tube and drill into place.

D. Once it has tightened the Torque Tube should come off with the drill.</td>
</tr>
</table>

DOOR GASKET REFRACTORY (6.3.2/05-001C)

The door gasket will degrade over time and will need to be replaced over time. The bottom of the door will see more degradation due to the waste burning in that vicinity.

1. Identify the damaged section of gasket that will need to be removed
2. With a utility knife cut out the section that needs to be replaced.
3. A new piece of gasket (PN: GSB 1.5") will need to be cut the same length as the removed piece.
4. With contact cement coat the gasket on one side and the door section and install.

CASTABLE REFRACTORY (6.3.2/05-001D)

Operators will notice that the castable refractory will show signs of minor cracking. The minor cracking is normal. Large sections of castable should not separate from the rest of the monolithic cast. Such occurrences are largely due to a sudden impact from machinery or dropping of the units themselves. Mortar (PN: SM3000) is supplied to help with a temporary repair while a permanent repair is resolved. Such permanent repairs are a third level repair and have to be considered on a case by case basis.

TEMPORARY REPAIR OF CASTABLE (6.3.2/05-001E)

1. Find the pieces of castable refractory that have separated.

2. Clean both the pieces of refractory and the area where the separation occurred.

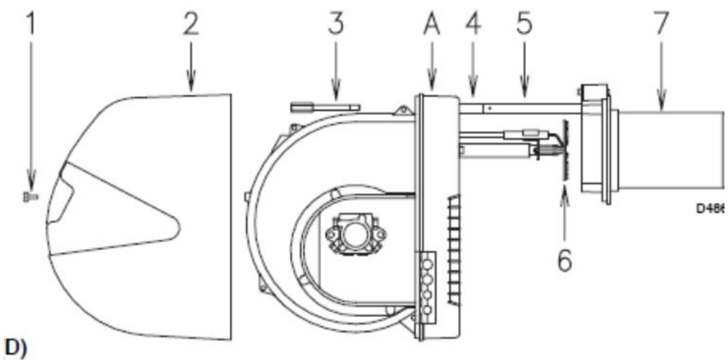
3. Spread an even amount of high temperature mortar on the pieces and the area of separation.

4. Put the pieces back where they originated and support as necessary for a minimum of an hour while the mortar cures.

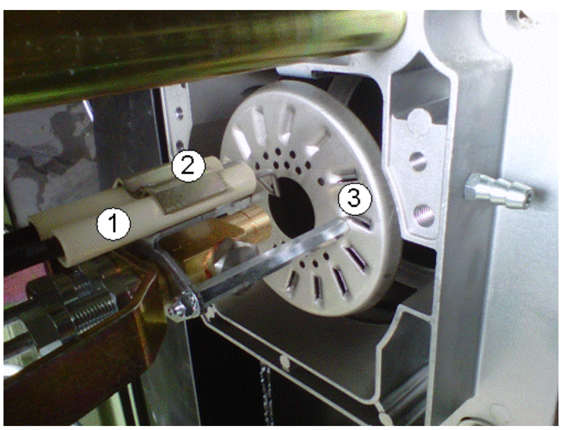
vi. Burner Corrective Maintenance Instructions

Do not store flammable or hazardous materials in the vicinity of fuel burning appliances.

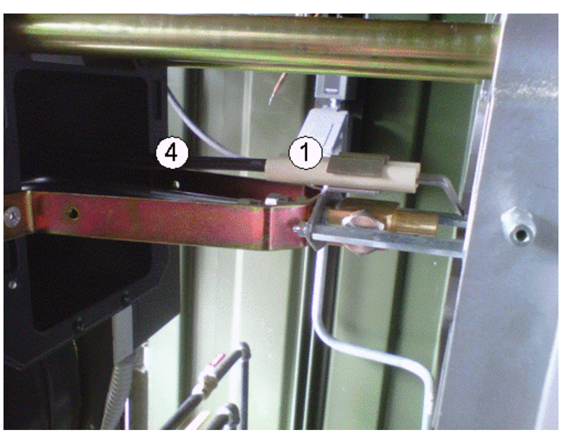
The Burners are pieces of equipment that will require routine corrective and preventive maintenance. Parts within this assembly will need to be repaired or replaced. The most common parts to be repaired or replaced are located at the front end of the burner where the parts are exposed to high temperatures.



Front End Primary Burner



1. Electrode
2. U-bolt
3. Diffuser Disc



4. HT Leads

HT LEAD & ELECTRODE REPLACEMENT (6.3.3/01-002A)

1. In order to change out the HT leads (PN: 3012995) Primary Burner or Electrode (PN: 3003796) the U-Bolt will have to be removed

2. Remove the electrode by pulling the lead out of the white ceramic tube, replace and re-install.

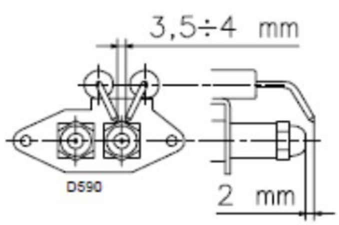
3. To change the Leads the wire will need to be removed from the burner.

4. Pull the wire out of the burner housing through the rubber grommet.

5. The other end is connected to the back of the control box. Pull the wire straight out and the spring fitting will disengage.

6. Replace the lead with a new one reversing the above directions.

7. When reinstalling the electrodes make sure that they are positioned as shown below:



Primary Burner

DIFFUSER DISC REPLACEMENT (6.3.3/01-002B)

1. Identify the diffuser disc in the above pictures.

2. The disc assembly is secured to the nozzle housing by 2 hex nuts.

3. Remove these nuts and remove the assembly from the burner.

4. The disc is attached to the assembly with 2 screws.

5. Remove the screws and replace the disc.
    - Primary Chamber Burner diffuser disc PN: 3003791

6. Reassemble.

NOZZLE REPLACEMENT (6.3.3/01-002C)

1. Identify the nozzle at the very front end of the burner just behind the diffuser disc.

2. Remove the nozzle with a wrench.

3. Install the new nozzle.
    - Primary Chamber Burner nozzle PN: C5222433

END CONE REPLACEMENT (6.3.3/01-002D)

The end cone will need replacement when the flame becomes unstable from too much heat damage.

1. Loosen and remove the 4 hex bolts that hold the burner on the flange.

2. Remove the burner completely from the incinerator. This will require more than one operator because the burner is heavy.

3. There are two screws that hold the end cone on. Remove and save the screws for the new end cone.

4. Install the new End Cone with the old screws.
    - Primary Chamber burner end cone PN: 3003807

5. Reinstall the burner.

NOZZLE ASSEMBLY REPAIR OR REPLACEMENT (6.3.3/01-002E)

The nozzle assembly is subjected to high heat cycling. The heat cycling will eventually cause the seals and assembly to leak. The assembly will have to be replaced when this occurs. First identify the location of the nozzle assembly.

The parts (seals, nozzle assembly) needed for these replacements are all included under one part number.

- Primary Chamber Burner nozzle assembly: PN: 3003814

Remove all connections to the nozzle assembly and replace with the above parts.

BURNER FLEXIBLE OIL LINE REPLACEMENT (6.3.3/01-002F)

1. Turn the inline ball valve to the closed position to isolate the fuel supply from the burner. This valve is located down line from the burner.

2. Remove flexible lines.

3. Replace with new lines.

    - Primary Chamber Burner flexible oil line: PN: C5281160

4. Open ball valve.

Primary Chamber Burner Flexible lines
(Item # 1 Above)

LEVEL SWITCH REPLACEMENT (6.3.3/01-002G & 02-002G)

The level switch is located in the Fuel Tank.

NOTA
Tanks do not have to be emptied to replace.

1. Unplug the level switch.
2. Disconnect the cord and remove the level switch.
3. Replace level switch (PN: FS301-01) and reconnect the cord.
4. Plug in the level switch.

INSPECTION WINDOW REPLACEMENT (6.3.3/01-002H & 02-002H)

To replace the inspection window simply remove the old inspection window and replace with a new one:

- Primary Burner inspection window PN: 3003763

FUEL PUMP REPLACEMENT (6.3.3/01-002I)

Identify the pump on the burner you wish to replace.

Remove all fuel connections to the pump with the appropriate wrench. Unbolt the pump from the main body of the burner and pull the pump away from the burner to remove.

Reinstall the new pump, and reattach all fuel connections.

- Primary Burner: PN: 3013027

CONTROL BOX REPLACEMENT (6.3.3/01-002J & 02-002J)

Identify the control box on the burner you wish to replace:

Ensuring the power is off unscrew the old control box and install the new one.

- Primary Burner: PN: 3012933

OIL TUBE REPLACEMENT (6.3.3/01-002K)

Oil tubes leak due to heat cycling which causes the fittings to fail or a loose fitting.

1. Identify the oil tubes on the Primary Burner and on the Secondary burner.
2. First try tightening the fittings to see if the leak stops. If the leak does not stop:
3. Remove the old oil tubes with a wrench and install the new ones:
    - Primary Burner Tubes: PN: 3003821
      PN: 3003822

BURNER PE CELL REPLACEMENT (6.3.3/01-002L)

Primary Burner: If the PE cell has been damaged, then it will need to be replaced. The PE cell while removed needs to be unplugged from the control box. This is accomplished by pulling the connection towards you. With the new PE cell install the control box end first by pushing the connection hard. Reinstall the PE cell in the burner.

BURNER FAN MOTOR REPLACEMET (6.3.3/01-002M)

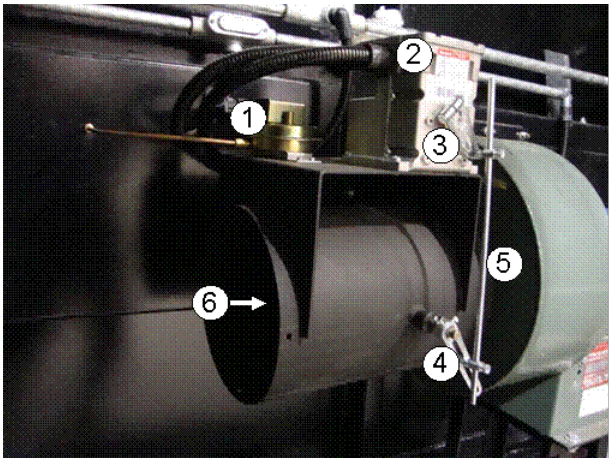
Identify the malfunctioning motor in the affected burner:

Unbolt and remove the malfunctioning motor from the housing. Disconnect all electrical connections. Reinstall the new motor exactly how the old motor was installed.

vii. Primary & Secondary Blower Corrective Maintenance Instructions

Do not attempt any maintenance on a fan unless the electrical supply has been completely disconnected and locked. In many cases, a fan can windmill despite removal of all electrical power. The rotating assembly should be blocked securely before attempting maintenance of any kind.

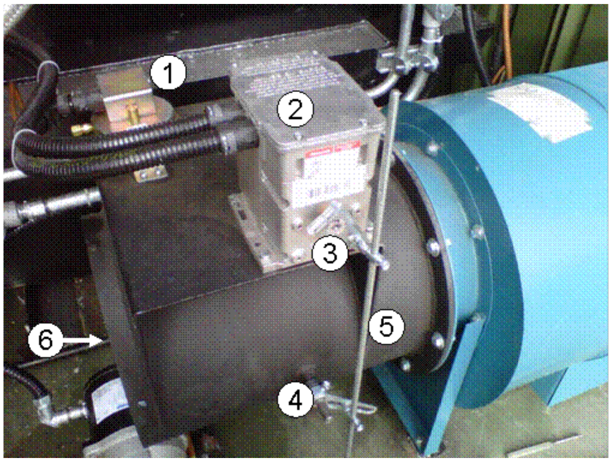
Primary Blower assemblies are not a commonly repaired part on the incinerator. Parts within this assembly will need to be repaired or replaced. They are outlined below.



Primary Blower

1. Air Proving Switch
2. Modutrol Motor
3. Motor Crank Arm
4. Damper Crank Arm
5. Rod
6. Damper

Secondary Blower assemblies are not a commonly repaired part on the incinerator. Parts within this assembly will need to be repaired or replaced. They are outlined below.



*Sample picture of a Secondary Blower and its assembly

Secondary Blower

1. Air Proving Switch
2. Modutrol Motor
3. Motor Crank Arm
4. Damper Crank Arm
5. Rod
6. Damper

AIR PROVING SWITCH REPLACEMENT (6.3.4/01-001A & 02-001A)

1. Ensure all power is locked out.
2. Remove wiring from switch.
3. Remove tubing from switch.
4. Unscrew screws at the two locations and remove switch.
5. Reinstall new switch (PN: SML8221210034) complete with tubing and wiring and then retighten.
6. Turn power back on.

DAMPER CALIBRATION (6.3.4/01-001B & 02-001B)

Sometimes the damper linkage will slip when the connections become loose (Items 3,4,5 in the Secondary Blower photo) In order to ensure that the linkage is correctly calibrated the operator will need to look at the display screen on the control panel while the unit is in operation

1. Read the % Open value on the control panel operator interface (PanelView) for the Primary Blower.
2. During operation the damper is factory preset to be 0% open, or fully closed.
3. Look inside the damper (Item 6) and ensure that the linkage is completely closed.
4. If it is then this maintenance is complete.
5. Should the damper be open even a small percentage the linkages are to be loosened and the damper adjusted to be completely closed, and then retighten.

MODUTROL RESISTOR REPLACEMENT (6.3.4/01-001C & 02-001C)

The Modutrol resistors are located inside the top lid of the Modutrol motor. Remove the lid to the Modutrol motor by unscrewing the top four (4) screws. The connection between the control panel and the Modutrol is made with a small white connector with 3 terminals. Jumpered between these terminals is the resistors.

Remove and replace the resistors one at a time to ensure the correct resistors are replaced. You identify the correct resistor by examining the color band on the center node of the resistor. Replace like resistors.

DAMPER CRANK ARM REPLACEMENT (6.3.4/01-001D & 02-001D)

The crank arm will only need to be replaced if the arm is damaged due to misuse. Identify the damper crank arm (Item #4 in the picture on the previous page).

Identify the location of the linkage on the rod and the damper arm with a marker, so the new crank arm will be in the same spot when reinstalled. Remove the connections to the crank arm and replace with the new one (PN: 26026G) and ensure it is in the same spot as the old one.

MODUTROL MOTOR & TRANSFORMER REPLACEMENT (6.3.4/01-001F & 02-001F)

To replace the Modutrol motor all power needs to be off to the system as you will need to expose electrical connections. Firstly get the new motor and orientate the motor in the same direction as the old motor. Identify where the conduit is connected on the old motor and punch the connector holes for the new motor.

Removal

1. Remove all electrical terminations and remove the transformer.
2. Install the transformer in the new Modutrol motor.
3. Remove all conduit connections on the motor.
4. Remove the damper arm and linkage from the motor.
5. Unbolt the motor from the damper, and ensure all nuts and bolts are kept for the new motor install

Install

1. Bolt the new motor in the same orientation as the old motor.
2. Install the damper arm and linkage to the motor
3. Install all conduit connections

Terminate all electrical connections the same as the old motor.

REPLACE THE BLOWER CONTACTOR 6.3.4/01-001G

1. Turn the Main Disconnect Switch off.
2. Open Panel.
3. Remove the wires from M1.
4. Pull the retaining clip up.
5. Tilt contactor forward and remove.
6. To reinstall tilt new contactor (PN: 100-C09D10) until it clicks back in.
7. Pull the retaining clip back down to lock.
8. Reinstall wires to M1.
9. Close panel.
10. Turn power back on.

viii. Main Control Panel Corrective Maintenance Instructions

MAIN CONTROL PANEL (6.3.6/03-010A)

All control panel diagnostics are to be completed by certified or trained technicians. Electrical drawings / diagrams are provided to aid electricians with any diagnostics.

REBOOT PLC (6.3.6/03-010B)

Turn Main Disconnect to the off position on the front of the Control Panel. Turn the main disconnect back on.

SECTION 7

PARTS LIST

ECO WASTE SOLUTIONS

ECO 1.75TN 1PV100L Parts List

General Incinerator Components	Quantity	Part #	Supplier
Primary Door Bearings		F4B-E-200R DGE	Canadian Bearings Ltd.
Secondary Door Bearings	5	F4B-E-104R DGE	Canadian Bearings Ltd.
Stack Bearings	2	P2B-SC-100	Canadian Bearings Ltd.
Toggle Clamps US$	6	51335A66	McMaster-Carr
View Ports	5	P1030/8	Pegasus
Thermocouple	4	TA-A427A-K08B-010.0	Thermo-Kinetics Company Ltd.
Metal ash bins 2.5 yds with lid	2	JT-2.5-60-188	JT Fabrication Ltd..
Blower Assemblies	Quantity	Part #	Supplier
Primary Chamber Blower	1	BI10	Canarm
Secondary Chamber Blower w/flanges	1	BI13	Canarm
Modutrol	2	M9184D4009	Yorkland Controls Limited
Air Proving Switch	3	SML 8221210034	Yorkland Controls Limited
Primary Chamber Burner	Quantity	Part #	Supplier
Primary Burner RL 28/2	1	C9511200	Riello
Fuel Tank 4500l	1	6011000	Hassco Industries Inc.
Ktech 37.5" low level switch stainless steel	1	FS301SF-1 28”NC	Ktech Industrial Products Inc.
Diesel filter	1	VF1210	National Energy Equipment Inc.
5 micron pleated paper filter	2	KPP21005B	National Energy Equipment Inc.
High Output Used Oil Burner	Quantity	Part #	Supplier
Special 6514-8-A fireall dual fuel burner complete with refractory tile, standard capacity iron nose	1	6514-8-A/LX/1.0A-X13546	Fives North American Combustion
3/4" Pilot Set	1	4015-0-T	Fives North American Combustion
1/2" std regulator	1	7218-01	Fives North American Combustion
3/8" sensitrol oil valve	1	1813-02-D	Fives North American Combustion
1/2”dia. x 18” AOL; 1/2” mnpt connectors e/e; braided CGA approved and tagged	1	C8777-01/18-CGA	Fives North American Combustion
2" butterfly valve	1	1122-4	Fives North American Combustion
Gauge, 0 - 60" wc and 0 - 35 osi	2	8735-HI	Fives North American Combustion
8" wafer valve	1	1156-9	Fives North American Combustion
Control motor, 310 IN/LBS, 37 second timing,4-20 ma, no feedback signal, 1000 ohm potentiometer, 135 degree travel, 110-120VAC	1	1615-F	Fives North American Combustion
Bracket and Linkage for 1615-A through N, for 1136, 1146, and 1156-9 through -22	1	2-9004-205	Fives North American Combustion
Pressure switch, 12 - 60" wc	1	8757-GAO-A4/4/6	Fives North American Combustion
DIF. PRES. SW 1-20"W.C.AUTO.RST	1	C8757-DG50T-DIF	Fives North American Combustion
1/2" ball valve	4	C1821-01	Fives North American Combustion
1/4" ball valve	5	C1821-03	Fives North American Combustion
Pressure gauge, 2-1/2"; 0-60 psi/400 kPa, dual scale; liquid filled 1/4" bottom; SS case;	2	C8735-M-LF	Fives North American Combustion
1/2" pressure regulator	1	7142-01-25	Fives North American Combustion
1/2" relief valve	1	7177-01-75	Fives North American Combustion

ECO WASTE SOLUTIONS

ECO 1.75TN 1PV100L Parts List

	Quantity	Part #	Supplier
Pressure switch #B424B range=0-100 psi	2	C8757-B424B-100	Fives North American Combustion
1/2" oil solenoid valve, NEMA 3R	1	1483-01	Fives North American Combustion
1/2" automatic reset oil shutoff valve 120/1/60	1	1517-01	Fives North American Combustion
1/4" Oil flow meter nickel-plated brass housing Buna o-ring 0.2-0.9 GPM SS orifice and spring vertical flow up	1	8598B-03-0.9-VU	Fives North American Combustion
1/2" ratiotrol with gauges	1	7052-01-WG	Fives North American Combustion
1/2" expansion chamber	1	C7000-0-HSR	Fives North American Combustion
3/4" regulator	2	C1485-01	Fives North American Combustion
Combution Blower -Chicago Blower	1	D53 E4	Canada Blower
Burner control	1	RM7895C1012	Yorkland Controls Limited
1" three way valve	1	4093T25	McMaster-Carr
1/2" three way valve	1	4093T23	McMaster-Carr
Used Oil Pump	1	03HB1131 code10/13	Albany Pump Company Ltd.
Basket suction strainer with 60 mesh	1	SBS-100	Albany Pump Company Ltd.
Ball Valve, 1" NPT, cUL Listed	1	BAVA-100	Albany Pump Company Ltd.
Relief Valve c/w WS spring (30-100 PSI)	1	FVJ-3R-SS	Albany Pump Company Ltd.
Pressure gauge, 4" Dial; liquid filled, 100 PSI	1	PG100LF-100	Albany Pump Company Ltd.
Compound Gauge;4" Dial; liquid filled; 30-0-30 PSI	1	CG100LF-30/30	Albany Pump Company Ltd.
Watson McDaniel size 3/4" Series 'B' pressure reducing valve	1	with Viton disc and diaphragm. 1-50 psig	Albany Pump Company Ltd.
Waste Oil ciculation heater with controller 600v. 3ph, 4687watts	1	CBLS747E13S	Hassco Industries Inc.
Transfer Pump	1	FR450B	National Energy Equipment Inc.
Oil Filter	1	VF1210	National Energy Equipment Inc.
5 micron pleated paper filter	2	KPP21005B	National Energy Equipment Inc.
Waste oil Tank 5000L	1	CUSTOMTANK	Hassco Industries Inc.
Level Switch	1	FS301SF-1 45"NC for 60 dia. tank	Ktech Industrial Products Inc.
Mixer	2	NP HGL-3.3	Metex Corporations
Waste oil totes IBC containment	2	H4435	ULINE CANADA CORPORATION
Waste oil totes IBC	2	H-3886	ULINE CANADA CORPORATION
Salt and/or sand box spillage kit	2	S18304	ULINE CANADA CORPORATION
Top Loading Package	Quantity	Part #	Supplier
Lid lifter HT 3500 Stoke 72"	1	9-LL-3500-72-BE-575	Canada Hydraulique Equipment Inc.
Lid Lifting Link Assembly	4	ECO5TN2PV-06-XX	P.D.S. WELDING LTD
Jaw Only 3/4" - 10 Right Hand Thread 12" max adj	4	3001T23	McMaster-Carr
18-8 Stainless Steel Clevis Pin, 3/4" Dia 2" L	4	92390A521	McMaster-Carr
Opacity Monitor	Quantity	Part #	Supplier
Compliance Opacity Monitoring System (EPA PS-1)	1	PN 80-0290	Akrulogic
Includes:			
Transceiver / Reflector			
Stack Mounting Flanges			
Local Control Panel			
1hp Air Purge Assembly			

ECO WASTE SOLUTIONS

ECO 1.75TN 1PV100L Parts List

-60C Air Purge Hose (2 pcs @ 20')	1	PN 80-3411 (Upgrade)	Akrulogic
Opacity Optic Head Extension Control Cable	1	PN 80-0297	Akrulogic
Scale	Quantity	Part #	Supplier
4 x 4 Scale w/ digital indicator, analog output and weather gland	1		Matrix Scale Service Inc.
Electrical	Quantity	Part #	Supplier
IEC 60 amp 600 volt rotary disconnect	1	GS2GU3N	Graybar
Disconnect operating handle	1	GS2AH420	Graybar
Operating shaft	1	GS2AE81	Graybar
175 amp power distribution block	1	PDB220-3	Graybar
175 amp power distribution block cover	1	CPB162-1	Graybar
Ground lug	1	LAMA2/0-14-QY	Graybar
600 volt 30 amp 3 pole class J fuse block	11	JT60030	Graybar
250 volt 30 amp 1 pole class RK1 fuse block	11	H25030-1CR	Graybar
600 volt 60 amp class J fuse	3	LPJ-60SP	Graybar
600 volt 17 amp class J fuse	3	LPJ-17SP	Graybar
600 volt 10 amp class J fuse	3	LPJ-10SP	Graybar
600 volt 7 amp class J fuse	8	LPJ-7SP	Graybar
600 volt 4 amp class J fuse	9	LPJ-4SP	Graybar
250 volt 30 amp class RK1 fuse	1	LPNRK-30SP	Graybar
250 volt 10 amp class RK1 fuse	1	LPNRK-10SP	Graybar
250 volt 6 amp class RK1 fuse	1	LPNRK-6SP	Graybar
250 volt 5 amp class RK1 fuse	2	LPNRK-5SP	Graybar
250 volt 2 amp class RK1 fuse	2	LPNRK-2SP	Graybar
250 volt 1 amp class RK1 fuse	4	LPNRK-1SP	Graybar
12 amp IEC contactor 120 VAC coil	1	LC1D12G7	Graybar
9 amp IEC contactor 120 VAC coil	6	LC1D9F7	Graybar
4 N.O. top mount auxilary contact	1	LADN40	Graybar
IEC solid state overload relay range 6.4- 32 a	1	LR9D32	Graybar
IEC solid state overload relay range 1.6-8 a	2	LR9D08	Graybar
IEC solid state overload relay range 0.2- 2 a	2	LR9D02	Graybar
16 amp SPDT slim line relay 120 VAC coil	10	RXG15F7	Graybar
Base slim line relay	10	RGZE1S35M	Graybar
8 PIN tube based relay 120VAC coil	10	RUMC23F7	Graybar
DPDT 8 PIN tube based relay base	10	RUZC2M	Graybar
600 to 120 VAC 3000 VA transformer	1	CE3000JA	Graybar
24 VDC 1.3 amp switching power supply	1	PS5R-SC24	SnS
5 port unmanaged ethernet switch US$99	1	SE-SW5U	Automation Direct
Current transducer US$75.5	1	ACT050-42L-F	Automation Direct
10.4" TFT touch panel with Intouch run time	1	TCND1U-10AC-CM2	Wonderware Canada East
600 volt 3 H.P. V.F.D.	1	ACS25-03U-04A1-6	Gerrie
480 volt 8 amp line reactor	1	3PR-004C5H	Graybar
0-1" H2O draft transmitter	1	616KD-00	Furneco
Ethernet PLC programing port	1	P-R2-F3R0	Gerrie

ECO WASTE SOLUTIONS

ECO 1.75TN 1PV100L Parts List

22mm Green illuminated push button operator	2	ZB5AW333	Graybar
22mm Emergency stop push button operator	1	ZB5AS844	Graybar
22mm 3 position return to center selector switch	1	ZB5AD5	Graybar
22mm Green flush push button operator	2	ZB5AA34	Graybar
22mm Black flush push button operator	2	ZB5AA24	Graybar
22mm Red extended push button operator	2	ZB5AL4	Graybar
Green integrated led module	2	ZBVG3	Graybar
N.O. contact block	5	ZBE101	Graybar
N.C. contact block	3	ZBE102	Graybar
Limit switch	4	802T-AP	Gerrie
Limit switch lever	4	802T-W2B	Gerrie
18 mm AC inductive proximity switch US$31	2	VK1-AO-1B	Automation Direct
Pt100 RTD for cold junction compensation	1	TFD	Omega
Unity CPU cw 1 Enet port and 1 serial port	1	BMXP342020	Graybar Canada Inc.
8 Slot Backplane	1	BMXXBP0800	Graybar Canada Inc.
110Vac Power supply	1	BMXCPS2000	Graybar Canada Inc.
16 point 120 vac input module	2	BMXDAI1604	Graybar Canada Inc.
8 channel analog input module	1	BMXAMI0810	Graybar Canada Inc.
4 channel thermocouple input module	1	BMXART0414	Graybar Canada Inc.
16 point relay output module	1	BMXDRA1605	Graybar Canada Inc.
4 Channel analog output module	1	BMXAMO0410	Graybar Canada Inc.
Connectors for all modules except AMI0810 and ART0814	4	BMXFTB2000	Graybar Canada Inc.
Connector for AMI080	1	BMXFTB2800	Graybar Canada Inc.
Connector	1	BMXFCW301S	Graybar Canada Inc.
IEC solid state overload relay range 0.2- 2 a	1	LR9D02	Graybar
1hp VFD ABB	1	ACS250-03U-02A1-6	Gerrie
1hp line reactor	1	REX3PR0002C5H	Graybar Canada Inc.
Type K Thermocouple 20AWG	300	K-20S-TT	Thermo-Kinetics Company Ltd.

APPENDIX B • TECHNICAL SPECIFICATIONS OF WASTE OIL BURNER

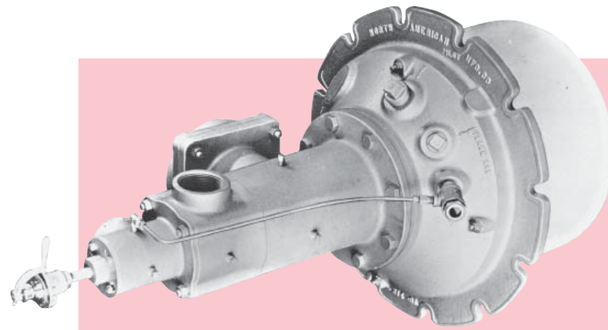
fives north american

FIRE•ALL™ DUAL-FUEL™ BURNERS

Bulletin 6514

February 2011

- **Dual Fuel Burner – gas or oil (light or heavy grade oil)**
- **Conventional forward flame pattern**
- **1.8 to 30 million Btu/hr**
- **Chambers up to 2400F (with alloy nose)**
- **Includes low pressure fuel oil atomizer**



6514 Burner Complete shown with optional (recommended) Sensitrol™ Oil Valve.

6514 FIRE•ALL Dual-Fuel Burners are nozzle mix, sealed-in burners for gas, light oil, or heavy oil. Capable of efficient operation throughout a wide temperature range, these burners are equally at home on low temperature ovens and high temperature forge and melting furnaces.

Ruggedly built for sustained, maintenance-free operation, 6514 Burners also provide for quick change of fuels without disturbing process operations.

Sealed mountings help maintain furnace pressure, controlled atmosphere, and closer air/fuel ratio control--all contributing to better product quality.

Fire•All Burners are a proven workhorse on all types of furnaces.

COMBUSTION CHARACTERISTICS

Oil. Oil viscosity at the burners must not exceed 100 SSU. Oil pressure at air/fuel Ratiotrol™ should be between 25 and 30 psi. Oil pressure at rated capacity is 10 to 15psi at Sensitrol™ and less than 1 psi at burner. Minimum atomizing air pressure at the burners is 14 osi for light oil, 22 osi for heavy oil.

Gas. Atomizing air (4 osi minimum) should be left on to protect the atomizer. Maximum required natural gas pressure at the burner for stoichiometric ratio is less than 4osi.

Air/Fuel Ratio. 6514 Dual-Fuel Burners are stable throughout a wide range from excess fuel to excess air. They can operate with excess fuel without forming carbon, but additional air for complete combustion must be available in the furnace near the burner.

For limits in a specific case, either rich or lean, consult Fives North American.

Turndown. Fire•All Burners can be turned down to atomizing air only (with fuel to match) except when burning residual oils in a cold, tight furnace.

Total air capacities (including main and atomizing air)

	16 osi air pressure drop across the burner				24 osi air pressure drop across the burner				
Burner designation	**Air① scfh**	**Light oil② gph**	**Heavy oil③ gph**	**Gas④ scfh**	**Air scfh**	**Light oil gph**	**Heavy oil gph**	**Gas scfh**	**Approx. flame lengths with 16 osi main air (in open furnace)**
6514-6	17 900	13	12	1 790	21 900	16	15	2 190	4' - 5'
6514-7	28 400	21	19	2 840	34 800	26	23	3 480	5' - 6'
6514-8-A	48 900	36	33	4 890	60 000	44	40	6 000	8' - 9'
6514-8-B	81 500	60	54	8 150	100 000	74	67	10 000	9' - 12'
6514-9	165 000	122	110	16 500	202 000	150	135	20 200	15' - 18'
6514-10	247 000	183	165	24 700	303 000	224	202	30 300	20'

① For Btu/hr, multiply by 100 ② Light oil at 135 000 Btu/gal. ③ Heavy oil at 150 000 Btu/gal. ④Natural gas at 1000 Btu/cf.

	Main air capacities in scfh — Air pressure drop across the burner in osi						**Atomizing air capacities in scfh** — Air pressure drop across the burner in osi					
Burner designation	**1**	**5**	**6**	**8**	**12**	**16**	**14**	**16**	**18**	**20**	**22**	**24**
6514-6	3 710	8 300	9 100	10 500	12 900	14 900	2 800	3 000	3 180	3 360	3 510	3 660
6514-7	6 100	13 600	15 000	17 200	21 000	24 400	3 770	4 030	4 270	4 500	4 720	4 900
6514-8-A	10 600	23 700	26 000	30 000	36 700	42 400	6 050	6 500	7 000	7 300	7 600	7 850
6514-8-B	17 600	39 200	43 000	49 600	60 500	70 000	10 600	11 300	12 000	12 700	13 200	13 800
6514-9	36 600	82 000	89 500	104 000	127 000	146 000	17 200	18 400	19 600	20 700	21 600	22 500
6514-10	54 500	122 000	135 000	154 000	189 000	218 000	27 200	29 100	30 900	32 600	34 100	35 500

Flame Supervision. An ultraviolet cell‡ will monitor pilot or main flame on gas or oil. For maximum safety, Fives North American urges **interrupted** pilots when flame safeguards are used--pilots should be on only for a preset ignition period (usually 15 seconds), after which flame supervision detects main fire only. Adapters for mounting flame detection devices on 6514 Burners are tabulated on Bulletin 8832.

Tile/Installation. Burner tiles are cast refractory rated for 2800F furnace temperature. They should be supported securely in the furnace wall by castable refractory (not insulation) at least 9" thick all around the tile, extending back to the furnace shell and securely anchored to it. (See Supplement DF-M1.)

Tiles are replaceable in the field except for the 6514-10, whose mounting must be returned to the factory for tile replacement (or purchase a spare mounting plate with a tile cast onto it).

Complete burners include tile, mounting plate, and an observation port into which a small quantity of atomizing air is introduced to keep the glass clear. Order pilot tips and Sensitrol™ Oil Valve separately. See 6514 Dimension Sheet for recommended Sensitrol™ oil valve and premix pilot tip.

Jacketed Tile options are available for applications where the tile is not supported by furnace refractory. Jackets are available in three different metals and have maximum temperature ratings for each. They must be protected with sufficient insulation so as not to exceed rated temperature.The maximum temperature rating depends upon frequency of heat-up/cool-down cycles. As an example, batch annealing furnaces that are heated and cooled every day should use the "intermittent exposure" ratings. Continuous annealing furnaces that remain at the same temperature for months at a time, can use the higher "continuous" rating.

Designation	Jacket Metal	Continuous max.temp.	Intermittent exposure
6514- -LC	carbon steel	700 F	700 F
6514- -L4	304 stainless	1600 F	1500 F
6514- -L9	309 stainless	1900 F	1800 F

‡ Cleaning air must be introduced into the port downstream of the sensor to keep oil and poc's off the lens.

Burner Nose options are available for sizes shown below and can be specified in the product number. The burner nose establishes main combustion air flow and influences flame propagation. Nose material is either cast iron that is suitable for cold air applications up to 1800F, or cast stainless alloy for preheated air (maximum 700F) applications up to 2400F.

Mat'l	Cap'y	-6	-7	-8A	-8B	-9	-10
Cast iron	1.0	√	√	√	√	√	√
Cast Alloy	1.0	√	√	√	√	√	√
Cast iron	1.1		√	√	√	√	√
Cast Alloy	1.1		√	√	√	√	√
Cast iron	1.2			√	√	√	√
Cast Alloy	1.2			√	√	√	√
Cast iron	1.3			√	√	√	√
Cast Alloy	1.3			√	√	√	√

The product designation 1.0 represents standard main air capacity shown on page 1. Use of an extra capacity burner nose will result in either more air at 16 osi or standard air flow at lower pressure. Extending the capacity of the burner by increasing air pressure beyond 16 osi, or using the extra capacity nose, is acceptable for most gas and light oil applications. Specific applications involving either low Btu fuels or heavy oil and extra capacity should be reviewed with Fives North American.

Also, when firing extra capacity, the combustion air flow velocity within the supply piping, and associated pressure loss, can be excessive for some burners. The -8B, -9 and -10 products when operated at 1.2 or 1.3 capacity will develop high pipe velocity based on the burner's air connection size. As an alternative to increasing blower pressure, an oversized air inlet can be purchased separately for these size burners. The connections are SW-type (slip-on sleeve or welded construction) and are one pipe size larger than the standard supply. Nose and oversize air connection part numbers can be found in supplement literature (see Parts List and Burner Options documents).

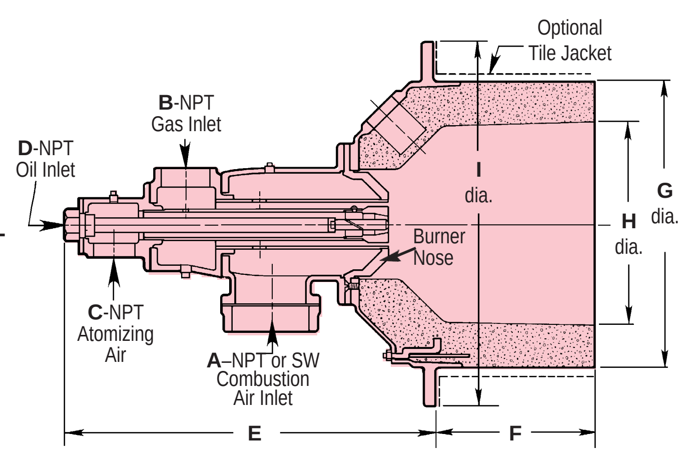
Options are available for the 6514 burner but require consultation with your Fives North American for application and ordering information. See Sheet 6514-3 for an overview of burner options.

CLEARANCE DIMENSIONS (for details, see Dimensions 6514)

Burner designation	A†	B	C	D	E	F	G	H	I	Wt. lbs.
6514-6	3	2	1½	⅜	18¾	9	15	10⅜	19½	195
6514-7-	4	2½	2	⅜	20 13/16	8⅞	16	11⅜	20½	225
6514-8-A	6	2½	2½	⅜	27 7/16	10	17¾	12⅜	22¾	335
6514-8-B	6	3	3	⅜	31¼	12⅞	19	13½	24	450
6514-9	8	4	4	½	38⅝	13 7/16	23	16	28	795
6514-10	10	6	6	½	45⅛	13⅝	27½	20½	32½	1035

(dimensions in inches)

† SW connection standard for -9 and -10 only.



DIMENSIONS SHOWN ARE SUBJECT TO CHANGE. PLEASE OBTAIN CERTIFIED PRINTS FROM FIVES NORTH AMERICAN COMBUSTION, INC. IF SPACE LIMITATIONS OR OTHER CONSIDERATIONS MAKE EXACT DIMENSION(S) CRITICAL.

Ordering Information

6514 - _ _ _ / _ _ / _ _ _ _

Product Size

Product Size	Connection
6	3"
7	4"
8-A	6"
8-B	6"
9	8"
10	10"

Tile

- BO .. burner only
- LX ... refractory tile (no jacket)
- LC ... steel tile jacket
- L4 ... 304 stainless jacket
- L9 ... 309 stainless jacket

Burner Nose

Capacity	Material
1.0 ... main air capacity	H ... cast iron
1.1 ... 1.1 x main air capacity	A ... alloy
1.2 ... 1.2 x main air capacity	
1.3 ... 1.3 x main air capacity	

Example 1	6514-8-A/LC/1.2A	Fireall gas burner complete with carbon steel jacketed tile and 1.2 capacity alloy nose
Example 2	6514-6/BO/1.0H	Fireall gas burner only with standard capacity iron nose
Example 3	6514-9/LX/1.2H	Fireall gas burner complete with refractory tile and 1.2 capacity iron nose

Note: See Supplement 6514-6 for cross referencing old product numbers.

Fives North American Combustion, Inc. - 4455 East 71st Street - Cleveland, OH 44105 USA - Phone 216.271.6000
Fax 216.641.7852 - email: fna.sales@fivesgroup.com - www.fivesgroup.com/fivesna

APPENDIX C • REGISTRATION FORM FROM THE NUNAVUT DEPARTMENT OF ENVIRONMENT: USED OIL AND WASTE FUEL APPLIANCE

REGISTRATION FORM: USED OIL AND WASTE FUEL APPLIANCE

A copy of the Used Oil and Waste Fuel Appliance registration form and user's guide is available by contacting the Nunavut Department of Environment or by downloading the documents at http://env.gov.nu.ca/programareas/environmentprotection. Although registration is voluntary, it enables Nunavut's Department of Environment to better manage used oil and waste fuel by maintaining an up-to-date inventory of certified appliances operating in Nunavut.

Instructions

1. The following information must be provided in order to register a used oil or waste fuel appliance and obtain a registration number. Incomplete applications will be returned to the applicant.
2. Completed registration forms are to be forwarded to the Environmental Protection Division, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to EnvironmentalProtection@gov.nu.ca.
3. Use additional pages to provide information as required.
4. Applicants should refer to the accompanying user's guide for further assistance on completing the generator registration form.
5. There is no fee for registering a used oil or waste fuel appliance with the Department of Environment.

Section 1 - Identification

Applicant (Legal Name) Agnico Eagles Mines Limted- Meliadine Project

Mailing Address Suite 879- Rankin Inlet, Nunavut, Canada

Postal Code X0C 0G0

Principle Contact Person Martin Theriault

Title Compliance counselor

Phone 1-819-759-3555; EX: 4608171

Email martin.theriault@agnicoeagle.com

Section 2 – Description of Operation

General Type of Business Mining Industry

Site Location(s) Where the Waste is Generated Meliadine project, Rankin Inlet- Incinerator area

Make, Model and Size of the Appliance 5000L waste oil tank- Hassco- 5000L DW S601

Waste Oil tank level switch- Ketch industrail FS301-01: Mixer- NP HGL 3.3

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person ______________________

Date (dd/mm/yy) 2019-01- 16

Print Name of Contact Person Martin Theriault

Title Compliance counselor

Phone 1-819-759-3555; EX: 4608171

Email martin.theriault@agnicoeagle.com

For Department Use Only

Appliance Registration Number NUA# __________ Approved by ______________ Date ____________

APPENDIX D • CONSULAIR AIR & ENIVIRONMENT GLOBAL MANAGEMENT AIR EMISSIONS REPORT

CONSULAIR
AIR & ENVIRONMENT GLOBAL MANAGEMENT

PROFESSIONNAL SERVICES
STACK TESTING PROGRAM
AIR EMISSIONS QUANTIFICATION
DOMESTIC WASTE INCINERATOR

AGNICO EAGLE

AGNICO EAGLE MINES LTD,
Rankin Inlet (Nunavut)
MELIADINE DIVISION
Kevin Buck
General Supervisor Environment

O/REF: **#18-5528**

consul-air.com

Quebec
2022, Lavoisier Street, Suite 125, Quebec
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PHONE - 450 654.8000
FAX - 450 654.6730

AGNICO EAGLE

Revision history

Version name	Date	Detail	Reviewed by
	---	---	---

PREPARED BY:

Louis Lawson, project manager

VERIFIED BY:

Cristina Danatoiu, engineer.

Quebec, December 2018

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

GLOSSARY

PM: Particulate matter

SVOC (PCDD/F): Dioxins and furans

ME: Metals

O_2: Oxygen

CO_2: Carbon dioxide

CO: Carbone monoxide

NO_X: Nitrogen oxide

ACFM: Actual cubic feet per minute

ECCC: Environment and Climate Change Canada

USEPA: United Stated Environmental Protection Agency

QA/QC: Quality Assurance / Quality Control

ΔP: Differential pressure read at the stack

ΔH: Differential pressure read at the control unit

DL: Detection Limit

SUMMARY

Consulair was mandated by Agnico Eagle Mines, Meliadine Division, to sample the atmospheric emissions at the outlet of an incinerator of its plant located near Rankin Inlet, Nunavut.

The objectives of the characterization of atmospheric emissions were to:

- Evaluate the physical characteristics of the gas flow in the stack;
- Evaluate the concentration and the emission rate of the particulate matter (P), Metals (ME) and Hydrogen chloride (HCl);
- Demonstrate the performance of the incinerator to meet the standards for mercury (Hg) and dioxins and furans (PCDD/F);
- Ensure that QA/QC of Consulair is respected throughout the stack sampling program.

For this project, the applicable standards are shown below with the tests results. The applicable standards for dioxins and furans (PCDD/F) were met for all tests, as well as the applicable standard for mercury (Hg). The standards come from the “Environmental Guideline for the Burning and Incineration of Solid Waste” emitted by the Department of Environment of the Government of Nunavut base on the Canadian Council of Ministers of the Environment (CCME) Canada - Wide Standards for Dioxins and Furans and Mercury Emissions.

The government of Nunavut presented a guideline document in October 2010, which was revised in January 2012, for the burning and incineration of solid waste. The document presented two criteria for air emissions which are applicable in the current project. A standard for Dioxins and Furans is stated at 80 pg I-TEQ/m^3 and another standard for mercury is stated at 20 µg/Rm^3. The reference conditions are stated at 101.3 kPa and 25°C and both standards are corrected to 11% O_2.

APPLICABLE STANDARDS		
CONTAMINANTS	TEST RESULTS	STANDARDS
MERCURY (Hg)	0.23 µg / Rm^3 @ 11 % v/v O_2	20 µg / Rm^3 @ 11 % v/v O_2
DIOXINS AND FURANS (PCDD/F)	0.042 ng / Rm^3 @ 11 % v/v O_2	0.08 ng TEQ / Rm^3 @ 11 % v/v O_2

R: Reference conditions 25 °C and 101.3 kPa on a dry basis.

SUMMARY

INORGANIC SAMPLING TRAIN	
STACK GAS PROPERTIES	
TEMPERATURE (°C)	744
MOISTURE (% v/v)	6.0
VELOCITY (m/s)	11.9
VOLUMETRIC FLOW RATE (m^3/h)	22,871
VOLUMETRIC FLOW RATE (Rm^3/h)	6,282
PARTICULATE MATTER	
PARTICULATE MATTER (mg/Rm^3)	26.8
PARTICULATE MATTER (mg/Rm^3) at 7 % O_2	58.3
PARTICULATE MATTER (mg/Rm^3) at 11 % O_2	41.5
PARTICULATE MATTER (kg/h)	0.16
PARTICULATE MATTER (g/s)	0.045
METALS (µg/Rm^3) @ 11% O_2	
CONCENTRATION	7,440
CLASS I (Cu, Pb, V & Zn)	352
CCME GUIDELINE	1,500
CLASS II (As, Cr & Ni)	22
CCME GUIDELINE	500
CLASS III (Cd, Hg & Tl)	2.3
CCME GUIDELINE	150
HCl	
HCl (mg/Rm^3)	25.7
HCl (mg/Rm^3) at 11 % O_2	37.3
HCl (ppm)	17.2
HCl (kg/h)	0.16
ORGANIC SAMPLING TRAIN	
STACK GAS PROPERTIES	
TEMPERATURE (°C)	743
MOISTURE (% v/v)	6.1
VELOCITY (m/s)	12.1
VOLUMETRIC FLOW RATE (m^3/h)	23,252
VOLUMETRIC FLOW RATE (Rm^3/h)	6,386
PCDD/F	
PCDD/F TEQ (ng/Rm^3) at 11 % O_2	0.042
STANDARD (ng/Rm^3) at 11% O_2	0.08
PCDD/F TEQ (µg/h)	0.18
R: Reference conditions 25 °C, 101.3 kPa on a dry basis.	

SUMMARY (Cont'd)

GAS	
OXYGEN (O_2)	
O_2 (% v/v d) - average	14.3
CARBON DIOXIDE (CO_2)	
CO_2 (% v/v d) - average	5.1
CARBON MONOXIDE (CO)	
CO (ppmvd) - average	2.8
CO (mg/Rm^3)	3.3
CO (kg/h)	0.021
NITROGEN OXIDES (NO_X) as NO_2	
NO_X (ppmvd) - average	53
NO_X as equivalent NO_2 (mg/Rm^3)	100
NO_X (kg/h)	0.65
SULPHUR DIOXIDE (SO_2)	
SO_2 (ppmvd) - average	0.2
SO_2 (mg/Rm^3)	0.6
SO_2 (kg/h)	0.004
R: Reference conditions 25 °C, 101.3 kPa on a dry basis.	

The sampling was performed in compliance with the rules of the requirements of the Report No. EPS 3/UP/2, including methods recommended by "Environment and Climate Change Canada" (ECCC) of the Government of Canada inside "Environment Canada, The National Incinerator Testing and Evaluation Program: Air Pollution Control Technology". Report No. EPS 3/UP/2, Ottawa, 1986.

1 INTRODUCTION

Consulair was mandated by Agnico Eagle Mines, Meliadine Division (Nu), to demonstrate the performance of the incinerator to meet the standards for mercury (Hg) and dioxins and furans (PCDD/F).

1.1 Sampling scope

The objectives of the characterization of atmospheric emissions were to:

- Evaluate the physical characteristics of the gas flow in the stack;
- Evaluate the concentration and the emission rate of particulate matter (P), Metals (ME) and Hydrogen chloride (HCl);
- Demonstrate the performance of the incinerator to meet the standards for mercury (Hg) and dioxins and furans (PCDD/F);
- Ensure that QA/QC of Consulair is respected throughout the stack sampling program.

The study included sources and pollutants referred in the following table.

Table 1-1 – OVERALL TEST MATRIX

SOURCE	POLLUTANTS	SAMPLING METHODS
Incinerator outlet	Particulate matter (PM)	EPS 1/RM/8 EC
	Hydrogen chloride (HCl)	EPS 1/RM/1 EC
	Metals	USEPA 29
	SVOC (PCDD/F)	EPS 1/RM/2 EC

2 SAMPLING TEAM AND PARTICIPANT

The interveners of this testing program are listed in Table 2-1 and 2-2. The analysis laboratory used is defined in Table 2-3.

Table 2-1 – CLIENT CONTACT

CLIENT	CONTACT	FUNCTION
Agnico Eagle Mines Limited Meliadine Division Rankin Inlet, Nunavut, Canada X0C 0G0	Kevin Buck General Supervisor Environment Tel: 819-759-3555 Kevin.buck@agnicoeagle.com	Test program coordination

Table 2-2 – SAMPLING TEAM

STAFF	TITLE	FUNCTION
Louis Lawson	Project Manager	On-site team leader On-site sampling Report writing
Jean-François Guay	Health and Safety Manager	On-site sampling
Cristina Danatoiu	Engineer	Report validation

Table 2-3 – ANALYSIS LABORATORY

LABORATORY	ANALYSIS	FIELD OF ACCREDITATION DR-12-LLA
Consulair	Particulate Matter	400
	Hydrogen chloride (HCl)	---
Maxxam	Metals	404 - 406
Agat	PCDD/F	510

3 SAMPLING

3.1 Process operation

A representative of the Agnico Eagle mines company had the responsibility to monitor the operating conditions to ensure the representativeness of the sampling. In order to perform the sampling program under representative conditions, a tight liaison was maintained with the operators during testing.

Process operating conditions of the incinerator were under Agnico-Eagle’s responsibility. The operating conditions were maintained stable throughout each days of the test program.

3.2 Source description

The number of measuring points in the stack was determined in accordance with the requirements of Environment Canada’s EPS 1/RM/8 sampling method entitled: "Reference methods for source testing: measurement of releases of particulate from stationary sources".

Stacks characteristics are described in the following table.

Table 3-1 – SAMPLED SITE CHARACTERISTICS

SOURCE	DIMENSION(S) Stack (m)	DIAMETER NUMBER)		NUMBER OF SAMPLING POINTS	
		A_D	B_D	Number of port used and sampling points	Total
Incinerator outlet	0.826	5.0	2.0	2 x 6	12

3.3 Sampling methodology

Sampling methods used in this project are methods approved and recommended by known organisms such as the United States Environmental Protection Agency (US EPA) and Environment Canada (EC).

The following table shows the sampling methods that were used during testing.

Table 3-2 – SAMPLING METHODS

PARAMETERS	METHODS	SAMPLING DURATION (min)
Manual sampling methods		
Temperature	Thermometer or thermocouple	With isokinetic value
Gas flow	SPE 1/RM/8, method B – Environment Canada	With isokinetic value
O_2, CO_2, CO	SPE 1/RM/8, method C – Environment Canada	With isokinetic value
Moisture content	SPE 1/RM/8, method D – Environment Canada	With isokinetic value
Particulate matter (PM)	SPE 1/RM/8, method E – Environment Canada	120 / 170 / 180
HCl	SPE 1/RM/1 – Environment Canada	
Metals	USEPA, CFR 40, Part 60, Method 29	
SVOC (PCDD/F)	SPE 1/RM/2 – Environment Canada	240 / 150 / 180
Instrumental sampling method		
NO_X	USEPA, CFR 40, Part 60, Method 7E	60
SO_2	USEPA, CFR 40, Part 60, Method 6C	60

The distribution of parameters within the sampling train is presented in the following table.

Table 3-3 – DISTRIBUTION OF PARAMETERS FOR EACH SAMPLING SYSTEM

SAMPLING TRAIN	PARAMETERS
Metals & Particulate matter & HCl	PM & Metals & HCl
SVOC	PCDD/F

3.4 Temperature, moisture content and flowrate

Gas temperature, flowrate, velocity and moisture content will be measured at the sampling sites according to "Reference methods for source testing: measurement of releases of particulate from stationary sources". Methods B and D, Environment Canada, December 1993, EPS 1/RM/8.

3.5 Isokinetic sampling

Isokinetic sampling allows to collect particles in the sampling nozzle at the same velocity as the gas stack velocity. In non-isokinetic conditions, if the sampling velocity is inferior than the gas stack velocity, more large particles would be collected resulting in an overestimation of the true mass concentration. On the opposite, if the sampling velocity is superior than the gas stack velocity, less large particles would be collected resulting in underestimation of the true mass concentration. In either case, the sample collected would not be an accurate reflection of the gas stack stream.

The following table presents a test acceptance criteria according to the methods (sampling systems) used.

Table 3-4 – SAMPLING ACEPTANCE CRITERIA

PARAMETERS	METHOD	ACCEPTANCE CRITERIA
Particulate Matter	SPE 1/RM/8	• Isokinetic rate comprised between 90 % and 110 % • Less than 10% of the sampled points out of the 90 % to 110 % range
Metals	Method 29 from USEPA	
SVOC	SPE 1/RM/2	

3.5.1 Particulate matter (PM), metals & HCl

Particulate matter (PM) and metals (Al, Sb, Ag, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Sn, Fe, Li, Mg, Mn, Mo, Ni, Pb, K, Se, Na, Ti, V, Zn, Sr, Tl, Si (Silicium soluble), Hg) were sampled in accordance with the requirements of Environment Canada EPS 1/RM/8 sampling method entitled: "Reference methods for source testing: measurement of releases of particulate from stationary sources". This method was combined with USEPA method 29 entitled “Metals emissions from stationary sources" in order to allow for metals sampling (including Hg). HCl was analyzed in the first impinger of that sampling train.

Table 3-5 – MAIN COMPONENTS OF THE PM/HCl/METALS SAMPLING SYSTEM

SAMPLING PROBE	SAMPLING TRAIN	CONTROL UNIT
• Quartz nozzle; • Quartz probe; • S type Pitot tube for the gas velocity attached to the sample probe; • Thermocouple for temperature attached to the sample probe.	• A 0.3 µm porosity pre-weighted quartz filter mounted in a Pyrex filter holder and placed in a heated oven to avoid moisture condensation; • Seven impingers placed in series and containing: ○ # 1: 100 mL H_2O; ○ # 2 and # 3: 100 mL HNO_3 (5%) / H_2O_2 (10%) solution; ○ # 4: empty; ○ # 5 and # 6: 100 mL $KMnO_4$ (4%) / H_2SO_4 (10%) solution; ○ # 7: silica gel; • Impingers placed in an ice bath to condense all the flue gas moisture.	• Sampling cord that connects the train to the sampling console; • Sampling console with oil manometer, a dry gas meter, an orifice, a temperature reader and temperature controllers; • Diaphragm vacuum pump.

3.5.2 Semivolatile organic compounds (SVOC) (PCDD/DF)

Semi Volatile Organic Compounds (SVOC) are defined as organic compounds with boiling points greater than 100 °C. This class of compounds includes PCDD (PolyChlorinated Dibenzo p Dioxins), PCDF (PolyChlorinated DibenzoFurans),

SVOCs (PCDD/F) were sampled in accordance with the requirements of Environment Canada EPS 1/RM/2 sampling method entitled: " Reference Method for Source Testing: Measurement of Releases of Selected Semi-Volatile Organic Compounds from Stationary Sources ". For this project, SVOCs included polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF). A minimal volume of at least 3.0 Rm^3 was sampled during each run.

For one series of three SVOC tests, a blank train was taken to the stack sampling site. A volume of ambient air equal to the sum of all leak check volumes during the SVOC test was pumped through the blank train, according to the requirements of reference method EPS 1/RM/2.

The following table shows the various components of the sampling system for PCDD/F.

Table 3-6 – MAIN COMPONENTS OF A SVOC SAMPLING SYSTEM

SAMPLING PROBE	SAMPLING TRAIN	CONTROL UNIT
• Glass nozzle of a precisely measured diameter to allow isokinetic sampling; • Glass heated probe to avoid moisture condensation; • Probe is fastened to an "S" type Pitot tube for gas velocity measurement and to a thermocouple for temperature measurement.	• A 0.3 µm porosity pre-weighted fiber glass filter mounted on an accurate holder and placed in a heated oven to avoid moisture condensation; • Condenser; • XAD-2 resin cartridge; • Condensate trap; • Three impingers placed in series and containing: o # 1: 100 mL ethylene glycol; o # 2: empty; o # 3: silica gel; • Impingers placed in an ice bath to condense all the flue gas moisture.	• Sampling cord that connects the train to the sampling console; • Sampling console with oil manometer, a dry gas meter, an orifice, a temperature reader and temperature controllers; • Diaphragm vaccum pump.

3.6 Gaseous parameters (O_2, CO_2, CO, SO_2 & NO_X)

One CEM (Continuous Emission Monitoring) systems was used to determine the concentration of O_2, CO_2, CO, SO_2 & NO_X. The CEM system includes a gas extraction system, one analyzer and a data acquisition system. The moisture-free gas was analysed for O_2, CO_2, CO, SO_2 & NO_X with an analyzer as described in the following table.

Graphics of continuous measurements of gas are presented in Appendix 2 of the report.

Table 3-7 – GAS ANALYZER

ANALYZER	O_2/CO_2	CO	SO_2	NO_X
Method	USEPA 3A	USEPA 10	USEPA 6C	USEPA 7E
Brand	Horiba	Horiba	Horiba	Horiba
Model	PG250	PG 250	PG 250	PG 250
Detector	Galvanic Cell / Infrared	Infrared	Infrared	Chemiluminescence
Zero gas	Nitrogen			
Working Scale	0 - 30 %v	0 – 100 ppmv	0 – 500 ppmv	0 – 1,000 ppmv

3.7 Testing schedule

Table 3-8 – TESTING SCHEDULE

SOURCE	DATE	TIME	TEST
Outlet of incinerator	2018-09-22	13:44-17:44	GAS & SVOC # 1
	2018-09-28	11:32-14:02	GAS & SVOC # 2
	2018-09-29	16:13-19:13	GAS & SVOC # 3
	2018-09-22	14:45-16:45	PM/Metal/HCl # 1
	2018-09-28	11:33-14:23	PM/Metal/HCl # 2
	2018-09-29	16:14-19:14	PM/Metal/HCl # 3

3.8 LAWS AND REGULATIONS

The government of Nunavut presented a guideline document in October 2010, which was revised in January 2012, for the burning and incineration of solid waste. The following emission standards apply to existing, new or expanding solid waste incinerators operating in Nunavut and have been adopted from the Canadian Council of Ministers of the Environment (CCME) Canada - Wide Standards for Dioxins and Furans and Mercury Emissions. The document presented two criteria for air emission which are applicable in the current project. A standard for Dioxins and Furans is stated at 80 pg I-TEQ/m^3 and another standard for mercury is stated at 20 µg/Rm^3. The R conditions are stated at 101.3 kPa and 25°C. Both standards are corrected to 11% O_2.

4 QUALITY CONTROL PROCEDURES (QA/QC)

The quality insurance program and control at Consulair has several elements to validate the methodologies used during sampling. The main points are detailed within this section.

4.1 QA/QC – PRE-TEST

4.1.1 Equipment, instruments and reagents

The sampling train glassware and sample containers were cleaned and checked according to the applicable reference methods.

The instruments used were subject of regular maintenance and are calibrated for less than a year. The calibration constants of the equipment used are shown in Tables 4-1 to 4-3. Calibration certificates of equipment are presented in Appendix 3 of the report.

The gas standards used for calibration of the analyzer were valid at the time of use considering the retention periods imposed by the supplier. The standard gases are certified to ± 2% by the supplier.

4.1.2 Field forms

The forms that present field data for the target parameters are shown in Appendix 5.

4.2 Sample tracking

A clean room inside the incinerator building was used for the assembly and the different stages of recovery of sampling trains. Recovery of samples was performed according to the procedures recommended by the methods.

The samples were collected in suitable containers as specified by the methods. All samples were kept cool during the sampling period and until the delivery of samples to analytical laboratories. Consulair used an identification system for the samples that allowed tracking the origin easily by a unique code coupled to a lookup table. Each sample number includes the date, test number, the precise location of the sampling, the nature and destination (analysis, archiving). This information is indicated on the chain of custody listing and the information is available on the analysis reports.

4.3 Validation criteria

Consulair ensured that each step of the air emission characterization program (including QA / QC program) will achieve the defined objectives, while respecting the deadline set by the customer.

4.3.1 Analytical laboratory

The particulate samples analysis was done in the laboratory of Consulair. This laboratory is accredited by the *Centre d'Expertise en Analyse Environnementale du Québec* (CEAEQ) for particulate matter (domain 400 of the air chemical section). The metals samples were analysed by Maxxam's laboratory, which is accredited by the *Centre d'Expertise en Analyse Environnementale du Québec* (CEAEQ) for metallic analysis (domain 404 of the air chemical section). The PCDD/F samples were analysed by AGAT's laboratory, which is accredited by the *Centre d'Expertise en Analyse Environnementale du Québec* (CEAEQ) for PCDD/F analysis (domain 510 of the air chemical section).

The analytical reports have been signed by a chemist and are presented in appendix 4. The laboratory also made available, in its report, the QA/QC program specific to the analysed contaminants.

4.3.2 Validation criteria – Particulate matter / Metals / HCl (PM/ME/HCl)

The following tables show the validation criteria of the methodology used.

Table 4-1 – QA/QC METHODOLOGY – PM/METALS/HCl

SPE 1/RM/8 METHODOLOGICAL INFORMATION				
TEST	ME-1	ME-2	ME-3	**CRITERIA**
CYCLONIC FLOW	0			≤ 15°
REVERSE FLOW	NO			NO
STACK DIAMETER (m)	0.826			≥ 0.3
A_0	2.0			≥ 0.5
B_0	5.0			≥ 2.0
SAMPLING TIME (min)	120	170	180	≥ 120
VOLUME SAMPLED (Rm^3)	2.76	2.83	3.77	≥ 2.8
ISOKINETICITY AVERAGE (%)	102	101	102	90 ≤ ISO ≤ 110
POURCENTAGE OF ISOKINETIC POINTS	100%	100%	100%	≥ 90
SAMPLING VELOCITY	OK	OK	OK	3.0 ≤ V ≤ 30 m/s
PROBE TEMPERATURE	NOT MEASURED			223 ≤ T ≤ 273 °F
FILTER TEMPERATURE	OK	OK	OK	223 ≤ T ≤ 273 °F
OUTLET TEMPERATURE	OK	OK	OK	32 ≤ T ≤ 68 °F
4% D_{MOY} (pi^3/min)	0.03	0.02	0.03	---
FLOW LEAK BEFORE at -15in Hg (ft^3/min)	0.020	0.020	0.020	≤ 0.02 or 4% Dmoy
FLOW LEAK AFTER (ft^3/min)	0.020	0.020	0.020	≤ 0.02 or 4% Dmoy
EQUIPMENT INFORMATION				
SAMPLING MODULE NO.	25	25	25	
METER FACTOR K_C	0.999	0.999	0.999	0.95 < K_C < 1.05
ORIFICE FACTOR K_O	0.733	0.733	0.733	
Δh@	2.529	2.529	2.529	
PITOT ID	05-07 5Q-501	05-07 5Q-501	05-07 5Q-501	
PITOT FACTOR	0.774	0.774	0.774	
NOZZLE ID	5Q-502	5Q-434	5Q-434	
NOZZLE DIAMETER (in)	0.4684	0.4366	0.4366	
R: Reference conditions at 101.3 kPa et 25°C, and dry basis.				

The sampling volume for the first test run is slightly lower than the 2.8 m^3 limit of the test method but should not have any impact on the result.

Table 4-2 – QA/QC METHODOLOGY – SVOC

TEST	PCDD/DF-1	PCDD/DF-2	PCDD/DF-3	CRITERIA
EQUIPEMENT INFORMATION				
SAMPLING MODULE NO.	19	19	19	N/A
METER FACTOR K_C	0.997	0.997	0.997	0.95 - 1.05
ORIFICE FACTOR K_O	0.994	0.994	0.994	N/A
PITOT ID	03-06 3Q-371	03-06 3Q-503	03-06 3Q-503	N/A
PITOT FACTOR	0.778	0.781	0.781	N/A
NOZZLE ID	3Q-371	3Q-503	3Q-503	N/A
NOZZLE DIAMETER (in)	0.3741	0.4958	0.4958	N/A
METHODOLOGICAL INFORMATION				
SAMPLING POINTS NUMBER	12	12	12	24
GAS VELOCITY (m/s)	11.7	10.6	13.9	3.0 - 30
SAMPLING TIME (min)	240	150	180	≥ 180
VOLUME SAMPLED (Rm^3)	3.38	3.39	4.99	≥ 3
SAMPLING RATE (pi^3/min)	0.48	0.78	0.95	N/A
ISOKINETICITY AVERAGE (%)	101	101	101	90 - 110
POURCENTAGE OF ISOKINETIC POINTS	100	100	100	≥ 90
PROBE TEMPERATURE (°F)	NOT MEASURED			223 - 273
FILTER TEMPERATURE (°F)	240 - 258	246 – 253	246 - 257	223 - 273
OUTLET TEMPERATURE (°F)	39 - 58	56 - 91	40 - 63	32 - 68
TRAP TEMPERATURE (°F)	46 - 69	38 - 63	41 - 69	33 - 68
FLOW LEAK BEFORE at -15in Hg (ft^3/min)	< 0.020	< 0.020	< 0.020	< 0.02
FLOW LEAK AFTER (ft^3/min)	< 0.020	< 0.020	< 0.020	< 0.02
R: Reference conditions at 101.3 kPa et 25°C, and dry basis.				

The sampling time for the second run of SVOC is under the 180 minutes limit of the method because of a process malfunction and the sampling had to be stopped. However, since the sampling volume for this test run is higher than the 3.0 m^3 limit of the method, this should have no impact on the result.

5 RESULTS

The reference values are reported at a temperature of 25°C and an atmospheric pressure of 101.3 kPa, on a dry basis.

For the inorganic results, a laboratory analysis value preceded of "<" means that the laboratory result is less than the detection limit reported (LDR) and represents a maximum result. In this case, the detection limit reported (LDR) is the value used.

The PCDD / F result tables include all toxic congeners (17) calculated with TEF (Toxic Equivalency Factor). The term "toxic equivalency (TEQ)" is the sum of the 17 toxic congeners calculated according to the TEF and when a congener was not detected by the laboratory analysis, it was replaced by "zero".

Unless otherwise indicated, the averages indicated in the tables below are the average of all tests carried out to the same source for the same operating condition.

Computer compiled data is presented in Appendix 1.

Table 5-1 – STACK GAS PROPERTIES

TESTS SCHEDULE				
TEST	RUN-1	RUN-2	RUN-3	AVERAGE
DATE	2018-09-22	2018-09-28	2018-09-29	(1 to 3)
START HOUR OF THE FIELD TEST	14:45	11:33	16:14	
END HOUR OF THE FIELD TEST	16:45	14:23	19:14	
STACK GAS PROPERTIES – METAL SAMPLING TRAIN				
TEMPERATURE (°C)	727	724	782	744
MOISTURE (% v/v)	6.2	5.5	6.3	6.0
VELOCITY (m/s)	12.0	10.2	13.5	11.9
STACK GAS FLOW RATE (m^3/h)	23 080	19 600	25 932	22 871
STACK GAS FLOW RATE (ft^3/min) (ACFM)	6 498	5 503	6 844	6 282
STACK GAS FLOW RATE (Rm^3/h)	13 585	11 536	15 263	13 461
STACK GAS FLOW RATE (Rft^3/min) (SCFM)	3 825	3 239	4 028	3 697
STACK GAS PROPERTIES – SVOC SAMLING TRAIN				
TEMPERATURE (°C)	726	723	780	743
MOISTURE (% v/v)	6.6	5.1	6.6	6.1
VELOCITY (m/s)	11.7	10.6	13.9	12.1
STACK GAS FLOW RATE (m^3/h)	22 509	20 452	26 796	23 252
STACK GAS FLOW RATE (ft^3/min) (ACFM)	13 248	12 038	15 771	13 686
STACK GAS FLOW RATE (Rm^3/h)	6 314	5 774	7 070	6 386
STACK GAS FLOW RATE (Rft^3/min) (SCFM)	3 717	3 398	4 161	3 759
GAS COMPOSITION				
CO_2 (% v/v d)	5.2	4.4	5.6	5.1
O_2 (% v/v d)	14.1	15.1	13.6	14.3
CO (ppmvd)	3	3	3	3
R: Reference conditions at 101.3 kPa and 25°C on a dry basis.				

Table 5-2 – RESULTS PM – HCL

TESTS SCHEDULE				
TEST	MEL-ME-1	MEL-ME-2	MEL-ME-3	AVERAGE
DATE	2018-09-22	2018-09-28	2018-09-29	(1 to 3)
START HOUR OF THE FIELD TEST	14:45	11:33	16:14	
END HOUR OF THE FIELD TEST	16:45	14:23	19:14	
DURATION OF THE TEST (MINUTES)	120	170	180	
PARTICULATE MATTER				
PARTICULATE MATTER (mg/Rm^3)	30.9	35.8	13.6	26.8
PARTICULATE MATTER (mg/Rm^3) at 7 % O_2	63.4	85.7	25.9	58.3
PARTICULATE MATTER (mg/Rm^3) at 11 % O_2	45.2	61.0	18.4	41.5
PARTICULATE MATTER (kg/h)	0.20	0.20	0.093	0.16
HCl				
HCl (mg/Rm^3)	32.4	12.0	32.6	25.7
HCl (mg/Rm^3) at 11 % O_2	**47.4**	**20.5**	**44.1**	**37.3**
HCl (ppm)	21.7	8.1	21.8	17.2
HCl (kg/h)	0.210	0.066	0.223	0.167
HCl (g/s)	0.0584	0.0184	0.0619	0.0463
R: Reference conditions at 101.3 kPa and 25°C on a dry basis.				

Table 5-3 – METALS CONCENTRATION

SCHEDULE OF TESTS				
TEST	MEL-ME-1	MEL-ME-1	MEL-ME-1	AVERAGE
DATE	2018-09-22	2018-09-28	2018-09-29	(1 to 3)
START HOUR OF THE FIELD TEST	14:45	11:33	16:14	
END HOUR OF THE FIELD TEST	16:45	14:23	19:14	
DURATION OF THE TEST (MINUTES)	120	170	180	
METALS (µg/Rm^3) @ 11% O_2				
Aluminium (Al)	307	24	21	118
Antimony(Sb)	129	2.3	78	70
Silver (Ag)	1.5	< 1.6	1.2	1.4
Arsenic (As)	9.2	0.96	11	7.1
Baryum (Ba)	4.1	0.72	0.45	1.7
Beryllium (Be)	< 0.13	< 0.16	< 0.089	< 0.13
Bismuth (Bi)	0.55	0.19	1.8	0.85
Boron (B)	14	8.6	37	20
Cadmium (Cd)	2.0	0.57	3.5	2.0
Calcium (Ca)	1,095	239	142	492
Chromium (Cr)	9.8	3.2	26	13
Cobalt (Co)	0.42	< 0.24	0.18	0.28
Copper (Cu)	48	15	48	37
Tin (Sn)	54	16	68	46
Iron (Fe)	576	331	49	318
Lithium (Li)	5.8	21	13	13
Magnesium (Mg)	167	28	27	74
Manganese (Mn)	36	14	2.1	17
Mercury (Hg)	0.47	0.21	0.018	0.23
Molybdenum (Mo)	3.6	< 1.6	3.9	3.0
Nickel (Ni)	4.6	0.48	0.82	2.0
Lead (Pb)	68	23	160	83
Potassium (K)	5,348	716	3,662	3,242
Selenium (Se)	0.74	0.48	0.36	0.52
Silicium (Si)	409	107	212	243
Sodium (Na)	4,180	520	2,473	2,391
Strontium (Sr)	2.8	0.42	0.25	1.2
Thallium (Tl)	< 0.21	< 0.24	< 0.14	< 0.20
Titanium (Ti)	29	4.2	3.2	12
Vanadium (V)	0.79	< 0.48	0.39	0.55
Zinc (Zn)	274	34	385	231
DETECTED METAL	**12,780**	**2,111**	**7,430**	**7,440**
TOTAL METALS	**12,780**	**2,115**	**7,430**	**7,442**
R: Reference conditions at 101.3 kPa and 25°C on a dry basis.				

Table 5-4 – METALS EMISSION RATE

SCHEDULE OF TESTS				
TEST	MEL-ME-2	MEL-ME-1	MEL-ME-3	AVERAGE
DATE	2018-09-22	2018-09-28	2018-09-29	(1 to 3)
START HOUR OF THE FIELD TEST	14:45	11:33	16:14	
END HOUR OF THE FIELD TEST	16:45	14:23	19:14	
DURATION OF THE TEST (MINUTES)	120	170	180	
METALS (g/h)				
Aluminium (Al)	1.4	0.078	0.11	0.52
Antimony(Sb)	0.58	0.0076	0.40	0.33
Silver (Ag)	0.0068	< 0.0051	0.0060	0.0060
Arsenic (As)	0.041	0.0031	0.057	0.034
Baryum (Ba)	0.018	0.0023	0.0023	0.0076
Beryllium (Be)	< 0.00059	< 0.00051	< 0.00045	< 0.00052
Bismuth (Bi)	0.0024	0.00062	0.0091	0.0041
Boron (B)	0.063	0.028	0.19	0.093
Cadmium (Cd)	0.0091	0.0018	0.018	0.0096
Calcium (Ca)	4.9	0.78	0.72	2.1
Chromium (Cr)	0.044	0.010	0.13	0.063
Cobalt (Co)	0.0019	< 0.00078	0.00091	0.0012
Copper (Cu)	0.22	0.050	0.24	0.17
Tin (Sn)	0.24	0.051	0.34	0.21
Iron (Fe)	2.6	1.1	0.25	1.3
Lithium (Li)	0.026	0.070	0.064	0.053
Magnesium (Mg)	0.75	0.091	0.14	0.32
Manganese (Mn)	0.16	0.045	0.011	0.072
Mercury (Hg)	0.0021	0.00070	0.000091	0.00096
Molybdenum (Mo)	0.016	< 0.0051	0.020	0.014
Nickel (Ni)	0.020	0.0016	0.0042	0.0087
Lead (Pb)	0.30	0.074	0.81	0.40
Potassium (K)	24	2.3	19	15
Selenium (Se)	0.0033	0.0016	0.0018	0.0022
Silicium (Si)	1.8	0.35	1.1	1.1
Sodium (Na)	19	1.7	13	11
Strontium (Sr)	0.012	0.0014	0.0013	0.0050
Thallium (Tl)	< 0.00094	< 0.00078	< 0.00073	< 0.00082
Titanium (Ti)	0.13	0.014	0.016	0.053
Vanadium (V)	0.0035	< 0.0016	0.0020	0.0024
Zinc (Zn)	1.2	0.11	2.0	1.1
DETECTED METAL	**57**	**6.9**	**38**	**34**
TOTAL METALS	**57**	**6.9**	**38**	**34**
R: Reference conditions at 101.3 kPa and 25°C on a dry basis.				

Table 5-5 – CONCENTRATION - PCDD/F CONGENERS

SCHEDULE OF TESTS				
SERIAL NUMBER TEST	MEL-COSV-1	MEL-COSV-2	MEL-COSV-3	**AVERAGE**
DATE	2018-09-22	2018-09-28	2018-09-29	**(1 to 3)**
START OF TEST	13:44	11:32	16:13	
END OF TEST	17:44	14:02	19:13	
DURATION OF THE TEST (MINUTES)	240	150	180	
PCDD/DF CONGENERS (ng/Rm^3)				
2,3,7,8 - Tetra CDD	< 0.00030	0.0015	< 0.0014	0.0011
1,2,3,7,8 - Penta CDD	< 0.00089	0.014	0.0046	0.0065
1,2,3,4,7,8 - Hexa CDD	< 0.00089	0.016	0.0056	0.0074
1,2,3,6,7,8 - Hexa CDD	0.00089	0.021	0.013	0.011
1,2,3,7,8,9 - Hexa CDD	< 0.00089	0.024	0.013	0.013
1,2,3,4,6,7,8 - Hepta CDD	0.0050	0.093	0.061	0.053
1,2,3,4,6,7,8,9 - Octa CDD	0.0098	0.047	0.060	0.039
2, 3, 7, 8 - Tetra CDF	0.0044	0.014	0.043	0.021
1,2,3,7,8 - Penta CDF	< 0.0024	0.0062	0.012	0.0070
2,3,4,7,8 - Penta CDF	0.0027	0.013	0.033	0.016
1,2,3,4,7,8 - Hexa CDF	0.0039	0.018	0.065	0.029
1,2,3,6,7,8 - Hexa CDF	0.0027	0.0074	0.024	0.011
2,3,4,6,7,8 - Hexa CDF	0.0024	0.015	0.055	0.024
1,2,3,7,8,9 - Hexa CDF	< 0.0018	< 0.0059	0.0060	0.0046
1,2,3,4,6,7,8 - Hepta CDF	0.0047	0.019	0.095	0.040
1,2,3,4,7,8,9 - Hepta CDF	< 0.0018	0.0024	0.020	0.0081
1,2,3,4,6,7,8,9 - Octa CDF	0.0059	0.0050	0.045	0.019
Total Tetra CDD	0.0027	0.047	0.043	0.031
Total Penta CDD	0.0033	0.13	0.081	0.072
Total Hexa CDD	0.0074	0.27	0.14	0.14
Total Hepta CDD	0.0059	0.099	0.063	0.056
CDD TOTALS	**0.029**	**0.59**	**0.39**	**0.34**
Total Tetra CDF	0.030	0.083	0.23	0.11
Total Penta CDF	0.021	0.12	0.31	0.15
Total Hexa CDF	0.0095	0.051	0.19	0.084
Total Hepta CDF	0.0083	0.036	0.18	0.074
CDF TOTALS	**0.075**	**0.30**	**0.95**	**0.44**
CONGENERS TOTALS TOXIC	**0.051**	**0.32**	**0.56**	**0.31**
TOTAL HOMOLOGUOUS GROUPS	**0.19**	**1.7**	**2.6**	**1.5**
R: Reference conditions at 101.3 kPa and 25°C on a dry basis.				

Table 5-6 – CONCENTRATION - PCDD/F TEQ

SCHEDULE OF TESTS				
SERIAL NUMBER TEST	MEL-COSV-1	MEL-COSV-2	MEL-COSV-3	**AVERAGE**
TEQ - PCDD/F (ng/Rm³) at 11 % O_2				
2,3,7,8 - Tetra CDD	< LD	0.0025	< LD	0.0016
1,2,3,7,8 - Penta CDD	< LD	0.024	0.0062	0.010
1,2,3,4,7,8 - Hexa CDD	< LD	0.0027	0.00076	0.0012
1,2,3,6,7,8 - Hexa CDD	0.00013	0.0036	0.0017	0.0018
1,2,3,7,8,9 - Hexa CDD	< LD	0.0041	0.0018	0.0020
1,2,3,4,6,7,8 - Hepta CDD	0.000074	0.0016	0.00083	0.00083
1,2,3,4,6,7,8,9 - Octa CDD	0.0000014	0.0000080	0.0000081	0.0000059
2, 3, 7, 8 - Tetra CDF	0.00065	0.0024	0.0059	0.0030
1,2,3,7,8 - Penta CDF	< LD	0.00053	0.00084	0.00051
2,3,4,7,8 - Penta CDF	0.0020	0.011	0.022	0.012
1,2,3,4,7,8 - Hexa CDF	0.00056	0.0031	0.0088	0.0042
1,2,3,6,7,8 - Hexa CDF	0.00039	0.0013	0.0033	0.0016
2,3,4,6,7,8 - Hexa CDF	0.00035	0.0025	0.0074	0.0034
1,2,3,7,8,9 - Hexa CDF	< LD	< LD	0.00081	0.00069
1,2,3,4,6,7,8 - Hepta CDF	0.000069	0.00032	0.0013	0.00056
1,2,3,4,7,8,9 - Hepta CDF	< LD	0.000040	0.00027	0.00011
1,2,3,4,6,7,8,9 - Octa CDF	0.00000087	0.00000085	0.0000062	0.0000026
TOXIC EQUIVALENT TOTAL	**0.0042**	**0.059**	**0.062**	**0.042**
STANDARD (ng/Nm³) at 11% O_2	**0.08**			
TEQ / % OF THE STANDARD	5.2	73.8	77.8	52.3
TEQ - PCDD/F (µg/h)				
2,3,7,8 - Tetra CDD	< LD	0.0085	< LD	0.0068
1,2,3,7,8 - Penta CDD	< LD	0.080	0.033	0.039
1,2,3,4,7,8 - Hexa CDD	< LD	0.0090	0.0040	0.0045
1,2,3,6,7,8 - Hexa CDD	0.00056	0.012	0.0089	0.0072
1,2,3,7,8,9 - Hexa CDD	< LD	0.014	0.0092	0.0079
1,2,3,4,6,7,8 - Hepta CDD	0.00032	0.0054	0.0043	0.0034
1,2,3,4,6,7,8,9 - Octa CDD	0.0000062	0.000027	0.000042	0.000025
2, 3, 7, 8 - Tetra CDF	0.0028	0.0082	0.031	0.014
1,2,3,7,8 - Penta CDF	< LD	0.0018	0.0044	0.0023
2,3,4,7,8 - Penta CDF	0.0084	0.037	0.12	0.054
1,2,3,4,7,8 - Hexa CDF	0.0024	0.011	0.046	0.020
1,2,3,6,7,8 - Hexa CDF	0.0017	0.0043	0.017	0.0076
2,3,4,6,7,8 - Hexa CDF	0.0015	0.0085	0.039	0.016
1,2,3,7,8,9 - Hexa CDF	< LD	< LD	0.0042	0.0029
1,2,3,4,6,7,8 - Hepta CDF	0.00030	0.0011	0.0067	0.0027
1,2,3,4,7,8,9 - Hepta CDF	< LD	0.00014	0.0014	0.00055
1,2,3,4,6,7,8,9 - Octa CDF	0.0000037	0.0000029	0.000032	0.000013
TOXIC EQUIVALENT	**0.018**	**0.20**	**0.33**	**0.18**
R: Reference conditions at 101.3 kPa and 25°C, and dry basis.				

Table 5-7 – STACK GAS MEASUREMENTS

SCHEDULE OF TESTS			
SERIAL NUMBER TEST	MEL GAZ E1	MEL GAZ E2	MEL GAZ E3
DATE	2018-09-22	2018-09-28	2018-09-29
START OF TEST	13:50	11:35	16:15
END OF TEST	17:40	14:25	19:05
DURATION OF THE TEST (MINUTES)	230	170	170
OXYGEN (O_2)			
O_2 (% v/v d) average	14.1	15.1	13.6
O_2 (% v/v d) minimum	13.0	14.1	12.6
O_2 (% v/v d) maximum	15.4	15.8	14.6
CARBON DIOXIDE (CO_2)			
CO_2 (% v/v d) average	5.2	4.4	5.6
CO_2 (% v/v d) minimum	4.4	4.0	4.9
CO_2 (% v/v d) maximum	6.0	5.0	6.3
CARBON MONOXIDE (CO)			
CO (ppmvd) average	2.6	3.4	2.6
CO (ppmvd) minimum	1.9	2.6	1.3
CO (ppmvd) maximum	3.9	4.4	3.5
CO (mg/Rm^3)	3.0	3.9	3.0
AVERAGE EMISSION (kg/h)	0.019	0.022	0.021
NITROGEN OXIDES (NO_X as NO_2)			
NO_X (ppmvd) average	44	49	66
NO_X (ppmvd) minimum	28	42	56
NO_X (ppmvd) maximum	59	58	77
NO_X equivalent NO_2 (mg/Rm^3)	84	93	124
AVERAGE EMISSION (kg/h)	0.53	0.54	0.87
SULPHUR DIOXIDES (SO_2)			
SO_2 (ppmvd) average	0	0	0.6
SO_2 (ppmvd) minimum	0	0	0
SO_2 (ppmvd) maximum	0	0	3.6
SO_2 equivalent NO_2 (mg/Rm^3)	0	0	1.7
AVERAGE EMISSION (kg/h)	0	0	0.012
R: Reference conditions at 101.3 kPa et 25°C, and dry basis.			

6 CONCLUSION

According to the sampling methods and procedures combined with a rigorous quality control, the results of concentrations and / or emission rates presented in this report are valid and representative of the process operation conditions sampled for period test results.

The final results obtained are valid and representative of the operating conditions during the tests.

The sampling was made in compliance with the rules of the requirements of the Report No. EPS 3/UP/2, including methods recommended by “Environment and Climate Change Canada” (ECCC) of the Government of Canada inside “Environment Canada, The National Incinerator Testing and Evaluation Program: Air Pollution Control Technology”. Report No. EPS 3/UP/2, Ottawa, 1986.

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7 REFERENCES

Environment Canada (1993), SPE 1/RM/8 sampling method entitled: "Reference methods for source testing: measurement of releases of particulate from stationary sources".

Environment Canada (1993), SPE 1/RM/1 sampling method entitled: "Reference methods for source testing: measurement of releases of hydrogen chloride from stationary sources".

USEPA (1971), method 29 entitled “Metals emissions from stationary sources" in order to allow for anion and metals sampling.

Environment Canada (1993) SPE 1/RM/2 sampling method entitled: "Reference Method for Source Testing: Measurement of Releases of Selected Semi-volatile Organic Compounds from Stationary Sources".

Government of Nunavut (2012), Environmental Guideline for the Burning and Incineration of Solid Waste, Department of Environment, revised January 2012, 27 pages.

Environment Canada (1986) SPE 3/UP/2 sampling method entitled: " The National Incinerator Testing and Evaluation Program: Air Pollution Control Technology".

MDDELCC (2011), Règlement sur l’Assainissement de l’Atmosphère (RAA).

MDDELCC (2009), Guide d’échantillonnage à des fins d’analyses environnementales, Cahier 4, Échantillonnage des émissions atmosphériques en provenance de sources fixes.

USEPA (1971), method 3A, Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources, 4 pages.

USEPA (1971), method 6C, Determination of Sulfur Dioxide Emissions from Stationary Sources, 5 pages.

USEPA (1971), method 7E, Determination of Nitrogen Oxide Emissions from Stationary Sources, 27 pages.

USEPA (1971), method 10, Determination of carbon monoxide emissions from stationary sources, 5 pages.

APPENDIX 1
COMPUTED DATA

AEM Meliadine
18-5528
Incinérateur
ME

HORAIRE DES ESSAIS				
ESSAI NUMÉRO	MEL-ME-1	MEL-ME-2	MEL-ME-3	MOYENNE
DATE DE L'ESSAI	2018-09-22	2018-09-28	2018-09-29	(1 à 3)
DÉBUT DE L'ESSAI	14:45	11:33	16:14	
FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
DONNEES DES EQUIPEMENTS D'ECHANTILLONNAGE				
PRESSION BAROMÉTRIQUE ("Hg)	30.10	29.73	29.83	29.89
PRESSION STATIQUE ("H2O)	-0.08	-0.05	-0.05	-0.06
PRESSION STATIQUE (kPa)	-0.02	-0.01	-0.01	-0.01
COEFFICIENT DU COMPTEUR (25,25,25,25,	0.999	0.999	0.999	0.999
COEFFICIENT DU PITOT (05-07 5Q-501,05-(	0.774	0.774	0.774	0.774
DIAMÈTRE DE LA BUSE (po) (5Q-502,5Q-43	0.4684	0.4366	0.4366	0.4472
TEMPÉRATURE COMPTEUR (°F)	91	91	92	91
TEMPÉRATURE COMPTEUR (°C)	33	33	33	33
HUMIDITE DES GAZ & VOLUME ECHANTILLONNE				
VOLUME D'EAU (g)	133.3	121.6	186.7	147.2
VOLUME D'EAU (pi^3)	6.40	5.84	8.96	7.07
HUMIDITÉ GAZ (BWO)	0.062	0.055	0.063	0.060
HUMIDITÉ GAZ (%v)	6.2	5.5	6.3	6.0
VOLUME GAZ REFERENCE (pi^{3}R)	97.44	100.04	133.02	110.17
VOLUME GAZ REFERENCE (m^{3}R)	**2.759**	**2.833**	**3.767**	**3.120**
CARACTERISTIQUES DU CONDUIT				
DIAMÈTRES AVANT LES TROUS D'ÉCHANT	5.0	5.0	5.0	
DIAMÈTRES APRÈS LES TROUS D'ÉCHANT	2.0	2.0	2.0	
DIAMÈTRE DU CONDUIT (pi)	2.71	2.71	2.71	
DIAMÈTRE DU CONDUIT (m)	0.826	0.826	0.826	
ÉPAISSEUR DU PORT D'ÉCHANTILLONNAC	7.5	7.5	7.5	
LONGUEUR DU CONDUIT (pi)	0.0	0.0	0.0	
LARGEUR DU CONDUIT (pi)	0.0	0.0	0.0	
DIAMÈTRE ÉQUIVALENT (pi)	#VALEUR!	#VALEUR!	#VALEUR!	
DIAMÈTRE ÉQUIVALENT (m)	#VALEUR!	#VALEUR!	#VALEUR!	
PRESSION CONDUIT ("Hg)	30.09	29.73	29.83	29.88
PRESSION COMPTEUR ("Hg)	30.25	29.81	29.95	30.00
SURFACE DU CONDUIT (pi^2)	5.8	5.8	5.8	5.8
SURFACE DU CONDUIT (m^2)	0.54	0.54	0.54	0.54
CARACTERISTIQUES DES GAZ				
TEMPÉRATURE CHEMINÉE (°F)	1340	1336	1440	1372
TEMPÉRATURE CHEMINÉE (°C)	727	724	782	744
CO_2 (%vs)	5.2	4.4	5.6	5.1
O_2 (%vs)	14.1	15.1	13.6	14.3
O_2 (%vh)	13.3	14.3	12.7	13.4
CO (ppmvs)	3	3	3	3
SO_2 (%vs)	0	0	0	0
N_2 (%vs)	80.6	80.5	80.8	80.6
Ar (%vs)	0.00	0.00	0.00	0.00
POIDS MOLECULAIRE SEC	29.40	29.31	29.44	29.39
POIDS MOLECULAIRE HUMIDE	28.70	28.69	28.72	28.70
VITESSE DES GAZ (pi/s)	39.3	33.4	44.2	38.9
VITESSE DES GAZ (m/s)	12.0	10.2	13.5	11.9
DEBITS GAZ ACTUELS (pi^3/h)	815 078	692 166	915 770	807 671
DEBITS GAZ ACTUELS (m^3/h)	23 080	19 600	25 932	22 871
DEBITS GAZ ACTUELS (pi^3/min)(APCM)	13 585	11 536	15 263	13 461
DEBITS GAZ NORMALISES (pi^{3}R/h)	229 478	194 320	241 695	221 831
DEBITS GAZ NORMALISES (m^{3}R/h)	**6 498**	**5 503**	**6 844**	**6 282**
DEBITS GAZ NORMALISES (pi^{3}R/min) (RPCI	3 825	3 239	4 028	3 697

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18-5528
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ME

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DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
INFORMATIONS D'ECHANTILLONNAGE				
COEFFICIENT DE L'ORIFICE DU COMPTEU	0.733	0.733	0.733	
VITESSE MAXIMALE (m/s)	12.75	11.35	14.34	
VITESSE MINIMALE (m/s)	10.47	9.17	12.30	
10%Vmax (pi/s)	1.28	1.14	1.43	
Pourcentage >10%Vmax	100%	100%	100%	
NOMBRE POINTS ΔP 20% et + de ΔPmoy	2	3	0	
ISOCINÉTISME MOYEN (%)	102.2	100.8	101.6	
% PTS RESPECT CRITERE ISO	100%	100%	100%	
DEBIT DE POMPAGE MAX (pi^3/min)	0.91	0.65	0.82	
PRESSION DE VIDE MAX DURANT ESSAI (-	-2	-9	-4	
TEMPÉRATURE SONDE MAX (°F)	250	252	250	
TEMPÉRATURE SONDE MIN (°F)	250	243	250	
TEMPÉRATURE FILTRE MAX (°F)	260	261	250	
TEMPÉRATURE FILTRE MIN (°F)	260	246	250	
TEMPÉRATURE SORTIE MAX (°F)	67	67	40	
TEMPÉRATURE SORTIE MIN (°F)	40	67	40	
TEMPÉRATURE TRAPPE MAX (°F)	0	0	0	
TEMPÉRATURE TRAPPE MIN (°F)	0	0	0	
TEMPÉRATURE AUX 3 MAX (°F)	0	0	0	
TEMPÉRATURE AUX 3 MIN (°F)	0	0	0	
TEMPÉRATURE MODULE MAX (°F)	0	0	0	
TEMPÉRATURE MODULE MIN (°F)	0	0	0	
DEBIT DE POMPAGE MOYEN (pi^3/min)	0.82	0.61	0.76	
4% DEBIT DE POMPAGE MOYEN (pi^3/min)	0.033	0.024	0.030	
TEST DE FUITE AVANT LES ESSAIS À 15 "H	< 0.020	< 0.020	< 0.020	
TEST DE FUITE APRÈS LES ESSAIS (pi^3/mi	< 0.020	< 0.020	< 0.020	
PARTICULES FILTRABLES SPE 1/RM/8				
MASSE FILTRE (mg)	48.2	48.4	46.0	47.5
MASSE SONDE (mg)	37.0	53.1	5.3	31.8
MASSE BLANC ACÉTONE (mg)	< 1			
VOLUME BLANC ACÉTONE (mL)	91			
RÉSIDUS ACÉTONE (%)	0.001			
MASSE SONDE (mg)	37.0	53.1	5.30	31.8
MASSE TOTALE (mg)	85.2	101.5	51.3	79.3
CONCENTRATION (mg/m^3R)	**30.9**	**35.8**	**13.6**	**26.8**
CONCENTRATION (mg/m^3R) à 7% O_2	**63.4**	**85.7**	**25.9**	**58.3**
CONCENTRATION (mg/m^3R) à 11% O_2	**45.2**	**61.0**	**18.4**	**41.5**
TAUX D'ÉMISSION (kg/h)	0.20	0.20	0.093	0.16
TAUX D'ÉMISSION (g/s)	0.056	0.055	0.026	0.045
ACIDE CHLORHYDRIQUE (HCl)				
BLANC HCl (mg)	< 0.040			
CHLORURES (mg)	86.87	33.16	119.33	
HCl (mg)	89.34	34.10	122.72	82.1
HCl (mg/m^3R)	32.4	12.0	32.6	25.67
HCl (ppmvs)	21.7	8.1	21.8	17.21
HCl (mg/m^3R) 11% O_2	47.4	20.5	44.1	37.32
HCl (kg/h)	0.21	0.07	0.22	0.167

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DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX				
MÉTAUX PARTICULAIRES (µg)				
Aluminium (Al)	570.0	30.0	46.0	215.3
Antimoine (Sb)	245.0	3.60	219.0	155.9
Argent (Ag)	0.90	< 0.60	1.30	0.93
Arsenic (As)	17.2	1.30	30.9	16.5
Baryum (Ba)	7.28	0.65	1.06	3.00
Béryllium (Be)	< 0.050	< 0.060	< 0.050	< 0.053
Bismuth (Bi)	0.84	0.12	4.83	1.93
Bore (B)	4	4	4	4
Cadmium (Cd)	2.47	0.45	9.52	4.15
Calcium (Ca)	1930.0	309.0	243.0	827.3
Chrome (Cr)	18.20	5	73.4	32.2
Cobalt (Co)	0.50	< 0.10	0.20	0.27
Cuivre (Cu)	89.1	24.7	131.0	81.6
Étain (Sn)	77.4	4.00	166.0	82.5
Fer (Fe)	1070.0	33.0	82.0	395.0
Lithium (Li)	8.00	33.0	32.0	24.3
Magnésium (Mg)	216.0	34.0	36.0	95.3
Manganèse (Mn)	16.5	15.7	4.30	12.2
Molybdène (Mo)	4.80	< 0.60	8.90	4.77
Nickel (Ni)	8.10	0.40	2.00	3.50
Phosphore (P)				
Plomb (Pb)	127.0	36.0	444.0	202.3
Potassium (K)	10100.0	1170.0	10200.0	7156.7
Sélénium (Se)	< 0.50	< 0.50	0.50	0.50
Silicium (Si)	717.0	148.0	397.0	420.7
Sodium (Na)	7900.0	851.0	6890.0	5213.7
Strontium (Sr)	5.00	0.40	0.40	1.93
Tellurium (Te)				
Thallium (Tl)	< 0.10	< 0.10	< 0.10	< 0.10
Titane (Ti)	52.0	4.00	6.00	20.7
Uranium (U)				
Vanadium (V)	0.80	< 0.20	0.40	0.47
Zinc (Zn)	509.0	54.0	1070.0	544.3
Mercure (Hg)				
MÉTAUX DÉTECTÉS	**23697.2**	**2762.4**	**20103.4**	**15521.0**
MÉTAUX TOTAUX	**23697.8**	**2764.6**	**20103.6**	**15522.0**
Proportion de métaux versus particules (%	**27.8**	**2.7**	**39.2**	**23.2**

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FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX GAZEUX (µg)				
Aluminium (Al)	12.00	10.00	14.0	12.00
Antimoine (Sb)	< 0.30	< 0.30	< 0.30	< 0.30
Argent (Ag)	< 2.00	< 2.00	< 2.00	< 2.00
Arsenic (As)	< 0.30	< 0.30	< 0.30	< 0.30
Baryum (Ba)	0.45	0.55	0.20	0.40
Béryllium (Be)	< 0.20	< 0.20	< 0.20	< 0.20
Bismuth (Bi)	< 0.20	< 0.20	< 0.20	< 0.20
Bore (B)	22.5	10.40	99.3	44.1
Cadmium (Cd)	1.40	0.5	0.3	0.73
Calcium (Ca)	144.0	92.0	154.0	130.0
Chrome (Cr)	< 0.30	< 0.30	< 0.30	< 0.30
Cobalt (Co)	< 0.30	< 0.30	< 0.30	< 0.30
Cuivre (Cu)	2.60	1.10	2.30	2.00
Étain (Sn)	24.0	22.00	23.0	23.00
Fer (Fe)	21.00	521.0	54.0	198.7
Lithium (Li)	< 3.00	< 3.00	< 3.00	< 3.00
Magnésium (Mg)	101.0	13.00	39.0	51.0
Manganèse (Mn)	51.2	7.50	1.50	20.1
Molybdène (Mo)	< 2.00	< 2.00	< 2.00	< 2.00
Nickel (Ni)	0.60	0.40	0.30	0.43
Phosphore (P)				
Plomb (Pb)	< 2.00	< 2.00	< 2.00	< 2.00
Potassium (K)	34.0	< 30.0	< 30.0	< 31.3
Sélénium (Se)	0.90	0.30	0.50	0.57
Silicium (Si)	58.0	32.0	196.0	95.3
Sodium (Na)	< 20.0	< 20.0	< 20.0	< 20.0
Strontium (Sr)	< 0.30	< 0.30	< 0.30	< 0.30
Tellurium (Te)				
Thallium (Tl)	< 0.30	< 0.30	< 0.30	< 0.30
Titane (Ti)	< 3.00	< 3.00	< 3.00	< 3.00
Uranium (U)				
Vanadium (V)	< 0.70	< 0.60	< 0.70	< 0.67
Zinc (Zn)	9.70	2.60	5.10	5.80
Mercure (Hg)				
MÉTAUX DÉTECTÉS	**483**	**745**	**622**	**617**
MÉTAUX TOTAUX	**518**	**778**	**654**	**650**

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18-5528
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ME

HORAIRE DES ESSAIS				
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FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX TOTAUX (µg)				
Aluminium (Al)	582.0	40.0	60.0	227.3
Antimoine (Sb)	245.3	3.90	219.3	156.2
Argent (Ag)	2.90	< 2.60	3.30	2.93
Arsenic (As)	17.5	1.60	31.2	16.8
Baryum (Ba)	7.73	1.20	1.26	3.40
Béryllium (Be)	< 0.250	< 0.260	< 0.250	< 0.253
Bismuth (Bi)	1.04	0.32	5.03	2.13
Bore (B)	27	14	103	48
Cadmium (Cd)	3.87	0.95	9.82	4.88
Calcium (Ca)	2074.0	401.0	397.0	957.3
Chrome (Cr)	18.50	5	73.7	32.5
Cobalt (Co)	0.80	< 0.40	0.50	0.57
Cuivre (Cu)	91.7	25.8	133.3	83.6
Étain (Sn)	101.4	26.00	189.0	105.5
Fer (Fe)	1091.0	554.0	136.0	593.7
Lithium (Li)	11.00	36.0	35.0	27.3
Magnésium (Mg)	317.0	47.0	75.0	146.3
Manganèse (Mn)	67.7	23.2	5.80	32.2
Molybdène (Mo)	6.80	< 2.60	10.90	6.77
Nickel (Ni)	8.70	0.80	2.30	3.93
Phosphore (P)				
Plomb (Pb)	129.0	38.0	446.0	204.3
Potassium (K)	10134.0	1200.0	10230.0	7188.0
Sélénium (Se)	1.40	0.80	1.00	1.07
Silicium (Si)	775.0	180.0	593.0	516.0
Sodium (Na)	7920.0	871.0	6910.0	5233.7
Strontium (Sr)	5.30	0.70	0.70	2.23
Tellurium (Te)				
Thallium (Tl)	< 0.40	< 0.40	< 0.40	< 0.40
Titane (Ti)	55.0	7.00	9.00	23.7
Uranium (U)				
Vanadium (V)	1.50	< 0.80	1.10	1.13
Zinc (Zn)	518.7	56.6	1075.1	550.1
Mercure (Hg)	0.89	0.36	0.05	0
MÉTAUX DÉTECTÉS	**24 216**	**3 536**	**20 757**	**16 170**
MÉTAUX TOTAUX	**24 217**	**3 543**	**20 758**	**16 173**

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18-5528
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ME

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DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX PARTICULAIRE ($\mu g/m^3R$)				
Aluminium (Al)	207	11	12	76
Antimoine (Sb)	89	1.3	58	49
Argent (Ag)	0.33	< 0.21	0.35	0.29
Arsenic (As)	6.2	0.46	8.2	5.0
Baryum (Ba)	2.6	0.23	0.28	1.0
Béryllium (Be)	< 0.018	< 0.021	< 0.013	< 0.018
Bismuth (Bi)	0.30	0.042	1.3	0.54
Bore (B)	1.5	1.4	0.98	1.3
Cadmium (Cd)	0.90	0.16	2.5	1.2
Calcium (Ca)	699	109	65	291
Chrome (Cr)	6.6	1.8	19	9.3
Cobalt (Co)	0.18	< 0.035	0.053	0.090
Cuivre (Cu)	32	8.7	35	25
Étain (Sn)	28	1.4	44	25
Fer (Fe)	388	12	22	140
Lithium (Li)	2.9	12	8.5	7.7
Magnésium (Mg)	78	12	9.6	33
Manganèse (Mn)	6.0	5.5	1.1	4.2
Molybdène (Mo)	1.7	< 0.21	2.4	1.4
Nickel (Ni)	2.9	0.14	0.53	1.2
Phosphore (P)				
Plomb (Pb)	46	13	118	59
Potassium (K)	3660	413	2708	2260
Sélénium (Se)	< 0.18	< 0.18	0.13	0.16
Silicium (Si)	260	52	105	139
Sodium (Na)	2863	300	1829	1664
Strontium (Sr)	1.8	0.14	0.11	0.69
Tellurium (Te)				
Thallium (Tl)	< 0.036	< 0.035	< 0.027	< 0.033
Titane (Ti)	19	1.4	1.6	7.3
Uranium (U)				
Vanadium (V)	0.29	< 0.071	0.11	0.16
Zinc (Zn)	184	19	284	163
Mercure (Hg)				
MÉTAUX DÉTECTÉS	**8588**	**975**	**5337**	**4967**
MÉTAUX TOTAUX	**8588**	**976**	**5337**	**4967**

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FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX GAZEUX (ug/m^{3}R)				
Aluminium (Al)	4.3	3.5	3.7	3.9
Antimoine (Sb)	< 0.11	< 0.11	< 0.080	< 0.098
Argent (Ag)	< 0.72	< 0.71	< 0.53	< 0.65
Arsenic (As)	< 0.11	< 0.11	< 0.080	< 0.098
Baryum (Ba)	0.16	0.19	0.053	0.14
Béryllium (Be)	< 0.072	< 0.071	< 0.053	< 0.065
Bismuth (Bi)	< 0.072	< 0.071	< 0.053	< 0.065
Bore (B)	8.2	3.7	26	13
Cadmium (Cd)	0.51	0.18	0.080	0.25
Calcium (Ca)	52	32	41	42
Chrome (Cr)	< 0.11	< 0.11	< 0.080	< 0.098
Cobalt (Co)	< 0.11	< 0.11	< 0.080	< 0.098
Cuivre (Cu)	0.94	0.39	0.61	0.65
Étain (Sn)	8.7	7.8	6.1	7.5
Fer (Fe)	7.6	184	14	69
Lithium (Li)	< 1.1	< 1.1	< 0.80	< 0.98
Magnésium (Mg)	37	4.6	10	17
Manganèse (Mn)	19	2.6	0.40	7.2
Molybdène (Mo)	< 0.72	< 0.71	< 0.53	< 0.65
Nickel (Ni)	0.22	0.14	0.080	0.15
Phosphore (P)				
Plomb (Pb)	< 0.72	< 0.71	< 0.53	< 0.65
Potassium (K)	12	< 11	< 8.0	< 10
Sélénium (Se)	0.33	0.11	0.13	0.19
Silicium (Si)	21	11	52	28
Sodium (Na)	< 7.2	< 7.1	< 5.3	< 6.5
Strontium (Sr)	< 0.11	< 0.11	< 0.080	< 0.098
Tellurium (Te)				
Thallium (Tl)	< 0.11	< 0.11	< 0.080	< 0.098
Titane (Ti)	< 1.1	< 1.1	< 0.80	< 0.98
Uranium (U)				
Vanadium (V)	< 0.25	< 0.21	< 0.19	< 0.22
Zinc (Zn)	3.5	0.92	1.4	1.9
Mercure (Hg)				
MÉTAUX DÉTECTÉS	**175**	**263**	**165**	**201**
MÉTAUX TOTAUX	**188**	**275**	**174**	**212**

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18-5528
Incinérateur
ME

HORAIRE DES ESSAIS				
ESSAI NUMÉRO	MEL-ME-1	MEL-ME-2	MEL-ME-3	MOYENNE
DATE DE L'ESSAI	2018-09-22	2018-09-28	2018-09-29	(1 à 3)
DÉBUT DE L'ESSAI	14:45	11:33	16:14	
FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX TOTAUX (ug/m^{3}R)				
Aluminium (Al)	211	14	16	80
Antimoine (Sb)	89	1.4	58	49
Argent (Ag)	1.1	< 0.92	0.88	0.95
Arsenic (As)	6.3	0.56	8.3	5.1
Baryum (Ba)	2.8	0.42	0.33	1.2
Béryllium (Be)	< 0.091	< 0.092	< 0.066	< 0.083
Bismuth (Bi)	0.38	0.11	1.3	0.61
Bore (B)	9.6	5.1	27	14
Cadmium (Cd)	1.4	0.34	2.6	1.4
Calcium (Ca)	752	142	105	333
Chrome (Cr)	6.7	1.9	20	9.4
Cobalt (Co)	0.29	< 0.14	0.13	0.19
Cuivre (Cu)	33	9.1	35	26
Étain (Sn)	37	9.2	50	32
Fer (Fe)	395	196	36	209
Lithium (Li)	4.0	13	9.3	8.7
Magnésium (Mg)	115	17	20	50
Manganèse (Mn)	25	8.2	1.5	11
Molybdène (Mo)	2.5	< 0.92	2.9	2.1
Nickel (Ni)	3.2	0.28	0.61	1.3
Phosphore (P)				
Plomb (Pb)	47	13	118	60
Potassium (K)	3673	424	2716	2271
Sélénium (Se)	0.51	0.28	0.27	0.35
Silicium (Si)	281	64	157	167
Sodium (Na)	2870	307	1834	1671
Strontium (Sr)	1.9	0.25	0.19	0.78
Tellurium (Te)				
Thallium (Tl)	< 0.14	< 0.14	< 0.11	< 0.13
Titane (Ti)	20	2.5	2.4	8.3
Uranium (U)				
Vanadium (V)	0.54	< 0.28	0.29	0.37
Zinc (Zn)	188	20	285	164
Mercure (Hg)	0.32	0.13	0.013	0.15
MÉTAUX DÉTECTÉS	**8776**	**1248**	**5511**	**5178**
MÉTAUX TOTAUX	**8777**	**1251**	**5511**	**5179**

AEM Meliadine
18-5528
Incinérateur
ME

HORAIRE DES ESSAIS				
ESSAI NUMÉRO	MEL-ME-1	MEL-ME-2	MEL-ME-3	MOYENNE
DATE DE L'ESSAI	2018-09-22	2018-09-28	2018-09-29	(1 à 3)
DÉBUT DE L'ESSAI	14:45	11:33	16:14	
FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX TOTAUX ($\mu g/m^3R$) À 11 % DE O_2				
Aluminium (Al)	307	24	21	118
Antimoine (Sb)	129	2.3	78	70
Argent (Ag)	1.5	< 1.6	1.2	1.4
Arsenic (As)	9.2	0.96	11	7.1
Baryum (Ba)	4.1	0.72	0.45	1.7
Béryllium (Be)	< 0.13	< 0.16	< 0.089	< 0.13
Bismuth (Bi)	0.55	0.19	1.8	0.85
Bore (B)	14	8.6	37	20
Cadmium (Cd)	2.0	0.57	3.5	2.0
Calcium (Ca)	1095	239	142	492
Chrome (Cr)	9.8	3.2	26	13
Cobalt (Co)	0.42	< 0.24	0.18	0.28
Cuivre (Cu)	48	15	48	37
Étain (Sn)	54	16	68	46
Fer (Fe)	576	331	49	318
Lithium (Li)	5.8	21	13	13
Magnésium (Mg)	167	28	27	74
Manganèse (Mn)	36	14	2.1	17
Molybdène (Mo)	3.6	< 1.6	3.9	3.0
Nickel (Ni)	4.6	0.48	0.82	2.0
Phosphore (P)				
Plomb (Pb)	68	23	160	83
Potassium (K)	5348	716	3662	3242
Sélénium (Se)	0.74	0.48	0.36	0.52
Silicium (Si)	409	107	212	243
Sodium (Na)	4180	520	2473	2391
Strontium (Sr)	2.8	0.42	0.25	1.2
Tellurium (Te)				
Thallium (Tl)	< 0.21	< 0.24	< 0.14	< 0.20
Titane (Ti)	29	4.2	3.2	12
Uranium (U)				
Vanadium (V)	0.79	< 0.48	0.39	0.55
Zinc (Zn)	274	34	385	231
Mercure (Hg)	0.47	0.21	0.018	0.23
MÉTAUX DÉTECTÉS	**12780**	**2111**	**7430**	**7440**
MÉTAUX TOTAUX	**12780**	**2115**	**7430**	**7442**
CLASSE I (Cu, Pb, V & Zn)	**391**	**72**	**593**	**352**
LIGNE DIRECTRICE DU CCME		**1500**		
CLASSE II (As, Cr & Ni)	**24**	**4.7**	**38**	**22**
LIGNE DIRECTRICE DU CCME		**500**		
CLASSE III (Cd, Hg & Tl)	**2.5**	**0.78**	**3.5**	**2.3**
LIGNE DIRECTRICE DU CCME		**150**		
AUTRES MÉTAUX (Al, Ag, Ba, Be, B, Sn, Fe,	**12363**	**2033**	**6795**	**7064**

AEM Meliadine
18-5528
Incinérateur
ME

HORAIRE DES ESSAIS				
ESSAI NUMÉRO	MEL-ME-1	MEL-ME-2	MEL-ME-3	MOYENNE
DATE DE L'ESSAI	2018-09-22	2018-09-28	2018-09-29	(1 à 3)
DÉBUT DE L'ESSAI	14:45	11:33	16:14	
FIN DE L'ESSAI	16:45	14:23	19:14	
DUREE DE L'ESSAI (minutes)	120	170	180	
NOMBRE DE POINTS	24	34	36	
MÉTAUX TOTAUX (g/h)				
Aluminium (Al)	1.4	0.078	0.11	0.52
Antimoine (Sb)	0.58	0.0076	0.40	0.33
Argent (Ag)	0.0068	< 0.0051	0.0060	0.0060
Arsenic (As)	0.041	0.0031	0.057	0.034
Baryum (Ba)	0.018	0.0023	0.0023	0.0076
Béryllium (Be)	< 0.00059	< 0.00051	< 0.00045	< 0.00052
Bismuth (Bi)	0.0024	0.00062	0.0091	0.0041
Bore (B)	0.063	0.028	0.19	0.093
Cadmium (Cd)	0.0091	0.0018	0.018	0.0096
Calcium (Ca)	4.9	0.78	0.72	2.1
Chrome (Cr)	0.044	0.010	0.13	0.063
Cobalt (Co)	0.0019	< 0.00078	0.00091	0.0012
Cuivre (Cu)	0.22	0.050	0.24	0.17
Étain (Sn)	0.24	0.051	0.34	0.21
Fer (Fe)	2.6	1.1	0.25	1.3
Lithium (Li)	0.026	0.070	0.064	0.053
Magnésium (Mg)	0.75	0.091	0.14	0.32
Manganèse (Mn)	0.16	0.045	0.011	0.072
Molybdène (Mo)	0.016	< 0.0051	0.020	0.014
Nickel (Ni)	0.020	0.0016	0.0042	0.0087
Phosphore (P)				
Plomb (Pb)	0.30	0.074	0.81	0.40
Potassium (K)	24	2.3	19	15
Sélénium (Se)	0.0033	0.0016	0.0018	0.0022
Silicium (Si)	1.8	0.35	1.1	1.1
Sodium (Na)	19	1.7	13	11
Strontium (Sr)	0.012	0.0014	0.0013	0.0050
Tellurium (Te)				
Thallium (Tl)	< 0.00094	< 0.00078	< 0.00073	< 0.00082
Titane (Ti)	0.13	0.014	0.016	0.053
Uranium (U)				
Vanadium (V)	0.0035	< 0.0016	0.0020	0.0024
Zinc (Zn)	1.2	0.11	2.0	1.1
Mercure (Hg)	0.0021	0.00070	0.000091	0.00096
MÉTAUX DÉTECTÉS	**57**	**6.9**	**38**	**34**
MÉTAUX TOTAUX	**57**	**6.9**	**38**	**34**

R : Conditions de référence à 101.3 kPa et 25 °C, sur base sèche.

RELEVÉ D'ÉCHANTILLONNAGE: Incinérateur - ME - ESSAI# MEL-ME-1

Heure	Trav. #	Point #	Durée de pompage (min)	Différence de pression ("H_2O) ΔP	ΔH	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume de gaz (pi^3) Début	Fin	Total	Vitesse (m/s)	Iso. (%)	O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vacuum (po Hg)	Températures (°F) Sonde	Filtre	Sortie	Trappe F Cond	Aux3	Module
14 h 45	1	1	5	0.15	1.75	1300	79	79	79	534.62	538.31	**3.69**	11.1	98	14.1	5.2	3	-2.0	250	260	40	-	-	-
		1	5	0.15	1.76	1300	82	82	82	538.31	541.93	**3.62**	11.1	96				-2.0	250	260	40	-	-	-
		2	5	0.15	1.77	1300	83	83	83	541.93	545.49	**3.56**	11.1	94				-2.0	250	260	40	-	-	-
		2	5	0.14	1.65	1300	84	84	84	545.49	549.01	**3.52**	10.8	96				-2.0	250	260	40	-	-	-
		3	5	0.18	2.07	1348	84	84	84	549.01	553.11	**4.10**	12.4	100				-2.0	250	260	40	-	-	-
		3	5	0.18	2.07	1349	85	85	85	553.11	557.22	**4.11**	12.4	100				-2.0	250	260	40	-	-	-
		4	5	0.18	2.07	1354	86	86	86	557.22	561.31	**4.09**	12.4	100				-2.0	250	260	40	-	-	-
		4	5	0.18	2.08	1346	88	88	88	561.31	565.42	**4.11**	12.4	100				-2.0	250	260	40	-	-	-
		5	5	0.18	2.08	1348	88	88	88	565.42	569.51	**4.09**	12.4	99				-2.0	250	260	40	-	-	-
		5	5	0.18	2.08	1350	89	89	89	569.51	573.61	**4.10**	12.4	99				-2.0	250	260	40	-	-	-
		6	5	0.18	2.07	1361	89	89	89	573.61	577.68	**4.07**	12.4	99				-2.0	250	260	40	-	-	-
		6	5	0.18	2.07	1362	89	89	89	577.68	581.77	**4.09**	12.4	99				-2.0	250	260	40	-	-	-
	2	6	5	0.19	2.19	1364	92	92	92	581.77	586.08	**4.31**	12.8	102				-2.0	250	260	40	-	-	-
		6	5	0.19	2.21	1352	92	92	92	586.08	590.50	**4.42**	12.7	104				-2.0	250	260	40	-	-	-
		5	5	0.19	2.21	1356	94	94	94	590.50	595.00	**4.50**	12.7	105				-2.0	250	260	40	-	-	-
		5	5	0.19	2.22	1348	94	94	94	595.00	599.50	**4.50**	12.7	105				-2.0	250	260	40	-	-	-
		4	5	0.19	2.22	1352	95	95	95	599.50	604.03	**4.53**	12.7	106				-2.0	250	260	40	-	-	-
		4	5	0.19	2.22	1352	96	96	96	604.03	608.50	**4.47**	12.7	104				-2.0	250	260	40	-	-	-
		3	5	0.18	2.11	1355	97	97	97	608.50	613.00	**4.50**	12.4	108				-2.0	250	260	40	-	-	-
		3	5	0.18	2.11	1355	97	97	97	613.00	617.49	**4.49**	12.4	107				-2.0	250	260	40	-	-	-
		2	5	0.15	1.78	1337	98	98	98	617.49	621.69	**4.20**	11.2	109				-2.0	250	260	67	-	-	-
		2	5	0.15	1.82	1295	98	98	98	621.69	625.82	**4.13**	11.1	106				-2.0	250	260	67	-	-	-
		1	5	0.13	1.54	1337	99	99	99	625.82	629.70	**3.88**	10.5	108				-2.0	250	260	67	-	-	-
		1	5	0.13	1.54	1345	99	99	99	629.70	633.54	**3.84**	10.5	107				-2.0	250	260	67	-	-	-

RELEVÉ D'ÉCHANTILLONNAGE: Incinérateur - ME - ESSAI# MEL-ME-2

Heure	Trav. #	Point #	Durée de pompage (min)	Différence de pression ("H_2O) ΔP	ΔH	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume de gaz (pi^3) Début	Fin	Total	Vitesse (m/s)	Iso. (%)	O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vacuum (po Hg)	Températures (°F) Sonde	Filtre	Sortie	Trappe F Cond	Aux3	Module
11 h 33	1	1	5	0.15	1.31	1290	71	71	71	636.82	640.06	3.24	11.2	99	15.1	4.4	3	-7.0	247	250	67	-	-	-
		1	5	0.15	1.28	1341	72	72	72	640.06	643.25	3.19	11.3	99				-7.5	247	256	67	-	-	-
		1	5	0.15	1.27	1349	73	73	73	643.25	646.52	3.27	11.4	101				-8.5	250	252	67	-	-	-
		2	5	0.14	1.19	1352	74	74	74	646.52	649.71	3.19	11.0	102				-8.0	247	255	67	-	-	-
		2	5	0.14	1.19	1354	76	76	76	649.71	652.87	3.16	11.0	101				-7.5	251	252	67	-	-	-
		2	5	0.14	1.20	1354	78	78	78	652.87	656.06	3.19	11.0	102				-7.5	247	253	67	-	-	-
		3	5	0.13	1.12	1344	80	80	80	656.06	659.14	3.08	10.6	101				-7.0	247	252	67	-	-	-
		3	5	0.13	1.13	1340	82	82	82	659.14	662.29	3.15	10.5	103				-7.0	248	249	67	-	-	-
		3	5	0.13	1.13	1348	83	83	83	662.29	665.39	3.10	10.6	101				-9.0	248	250	67	-	-	-
		4	5	0.13	1.13	1347	85	85	85	665.39	668.50	3.11	10.6	101				-9.0	246	250	67	-	-	-
		4	5	0.13	1.13	1345	86	86	86	668.50	671.62	3.12	10.6	101				-6.5	252	253	67	-	-	-
		4	5	0.13	1.14	1348	88	88	88	671.62	674.77	3.15	10.6	102				-6.5	252	253	67	-	-	-
		5	5	0.13	1.15	1334	89	89	89	674.77	677.84	3.07	10.5	99				-9.0	246	249	67	-	-	-
		5	5	0.13	1.15	1330	91	91	91	677.84	680.96	3.12	10.5	100				-9.0	243	249	67	-	-	-
		5	5	0.13	1.15	1337	92	92	92	680.96	684.09	3.13	10.5	100				-9.0	252	252	67	-	-	-
		6	5	0.12	1.07	1334	93	93	93	684.09	687.13	3.04	10.1	101				-9.0	251	255	67	-	-	-
		6	5	0.12	1.07	1335	94	94	94	687.13	690.18	3.05	10.1	101				-9.0	249	251	67	-	-	-
		6	5	0.12	1.07	1340	95	95	95	690.18	693.21	3.03	10.1	101				-9.0	246	255	67	-	-	-
	2	6	5	0.12	1.07	1338	96	96	96	693.21	696.26	3.05	10.1	101				-9.0	248	259	67	-	-	-
		6	5	0.12	1.07	1338	97	97	97	696.26	699.31	3.05	10.1	101				-9.0	246	246	67	-	-	-
		6	5	0.12	1.08	1328	97	97	97	699.31	702.37	3.06	10.1	101				-9.0	251	250	67	-	-	-
		5	5	0.12	1.07	1344	98	98	98	702.37	705.44	3.07	10.1	101				-9.0	251	261	67	-	-	-
		5	5	0.12	1.07	1344	98	98	98	705.44	708.51	3.07	10.1	101				-9.0	249	252	67	-	-	-
		5	5	0.12	1.07	1345	99	99	99	708.51	711.60	3.09	10.1	102				-9.0	249	252	67	-	-	-
		4	5	0.12	1.07	1342	99	99	99	711.60	714.66	3.06	10.1	101				-9.0	249	252	67	-	-	-
		4	5	0.10	0.90	1329	100	100	100	714.66	717.50	2.84	9.2	102				-9.0	249	252	67	-	-	-
		4	5	0.10	0.91	1326	101	101	101	717.50	720.31	2.81	9.2	101				-9.0	249	252	67	-	-	-
		3	5	0.10	0.91	1326	101	101	101	720.31	723.10	2.79	9.2	100				-9.0	249	252	67	-	-	-
		3	5	0.10	0.90	1330	102	102	102	723.10	725.88	2.78	9.2	99				-9.0	249	252	67	-	-	-
		3	5	0.10	0.90	1330	102	102	102	725.88	728.68	2.80	9.2	100				-9.0	249	252	67	-	-	-
		2	5	0.10	0.91	1326	103	103	103	728.68	731.49	2.81	9.2	100				-9.0	249	252	67	-	-	-
		2	5	0.10	0.92	1316	104	104	104	731.49	734.29	2.80	9.2	99				-9.0	249	252	67	-	-	-
		2	5	0.10	0.91	1317	104	104	104	734.29	737.13	2.84	9.2	101				-9.0	249	252	67	-	-	-
		1	5	0.10	0.92	1311	105	105	105	737.13	740.00	2.87	9.2	102				-9.0	249	252	67	-	-	-

RELEVÉ D'ÉCHANTILLONNAGE: Incinérateur - ME - ESSAI# MEL-ME-3

Heure	Trav. #	Point #	Durée de pompage (min)	Différence de pression ("H_2O) ΔP	Différence de pression ("H_2O) ΔH	Températures (°F) Cheminée	Températures (°F) Compteur Entrée	Températures (°F) Compteur Sortie	Orifice	Volume de gaz (pi^3) Début	Volume de gaz (pi^3) Fin	Volume de gaz (pi^3) Total	Vitesse (m/s)	Iso. (%)	O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vacuum (po Hg	Températures (°F) Sonde	Températures (°F) Filtre	Températures (°F) Sortie	Températures (°F) Trappe F Cond	Températures (°F) Aux3	Températures (°F) Module
16:14	1	1	5	0.20	1.74	1327	78	78	78	747.13	750.85	3.72	13.0	99	13.6	5.6	3	-3.0	250	250	40	-	-	-
		1	5	0.20	1.72	1347	79	79	79	750.85	754.60	3.75	13.1	101				-3.0	250	250	40	-	-	-
		1	5	0.20	1.72	1350	80	80	80	754.60	758.43	3.83	13.1	103				-3.0	250	250	40	-	-	-
		2	5	0.20	1.71	1360	81	81	81	758.43	762.18	3.75	13.1	101				-3.0	250	250	40	-	-	-
		2	5	0.20	1.70	1374	81	81	81	762.18	765.96	3.78	13.2	102				-3.0	250	250	40	-	-	-
		2	5	0.20	1.70	1378	82	82	82	765.96	769.75	3.79	13.2	102				-3.0	250	250	40	-	-	-
		3	5	0.22	1.87	1380	83	83	83	769.75	773.68	3.93	13.8	101				-3.0	250	250	40	-	-	-
		3	5	0.23	1.95	1393	84	84	84	773.68	777.76	4.08	14.2	103				-3.0	250	250	40	-	-	-
		3	5	0.23	1.94	1401	85	85	85	777.76	781.76	4.00	14.2	101				-3.0	250	250	40	-	-	-
		4	5	0.23	1.93	1410	85	85	85	781.76	785.75	3.99	14.3	101				-3.0	250	250	40	-	-	-
		4	5	0.23	1.92	1420	86	86	86	785.75	789.77	4.02	14.3	101				-3.0	250	250	40	-	-	-
		4	5	0.23	1.93	1423	87	87	87	789.77	793.77	4.00	14.3	101				-3.0	250	250	40	-	-	-
		5	5	0.23	1.92	1431	88	88	88	793.77	797.79	4.02	14.3	101				-3.0	250	250	40	-	-	-
		5	5	0.20	1.68	1418	89	89	89	797.79	801.59	3.80	13.3	102				-3.0	250	250	40	-	-	-
		5	5	0.20	1.68	1430	90	90	90	801.59	805.38	3.79	13.4	102				-3.0	250	250	40	-	-	-
		6	5	0.20	1.69	1418	90	90	90	805.38	809.19	3.81	13.3	102				-3.0	250	250	40	-	-	-
		6	5	0.20	1.67	1440	90	90	90	809.19	813.00	3.81	13.4	103				-3.0	250	250	40	-	-	-
		6	5	0.20	1.67	1445	91	91	91	813.00	816.78	3.78	13.4	102				-4.0	250	250	40	-	-	-
	2	6	5	0.20	1.66	1451	91	91	91	816.78	820.57	3.79	13.4	102				-4.0	250	250	40	-	-	-
		6	5	0.20	1.66	1460	92	92	92	820.57	824.36	3.79	13.5	102				-4.0	250	250	40	-	-	-
		6	5	0.20	1.65	1467	93	93	93	824.36	828.17	3.81	13.5	103				-4.0	250	250	40	-	-	-
		5	5	0.19	1.57	1476	94	94	94	828.17	831.88	3.71	13.2	103				-4.0	250	250	40	-	-	-
		5	5	0.19	1.57	1479	95	95	95	831.88	835.60	3.72	13.2	103				-4.0	250	250	40	-	-	-
		5	5	0.19	1.57	1481	96	96	96	835.60	839.27	3.67	13.2	101				-4.0	250	250	40	-	-	-
		5	5	0.19	1.55	1502	97	97	97	839.27	842.94	3.67	13.3	102				-4.0	250	250	40	-	-	-
		5	5	0.21	1.71	1518	99	99	99	842.94	846.82	3.88	14.0	103				-4.0	250	250	40	-	-	-
		5	5	0.21	1.71	1518	99	99	99	846.82	850.70	3.88	14.0	103				-4.0	250	250	40	-	-	-
		5	5	0.21	1.71	1520	100	100	100	850.70	854.57	3.87	14.0	102				-4.0	250	250	40	-	-	-
		5	5	0.21	1.72	1518	101	101	101	854.57	858.43	3.86	14.0	102				-4.0	250	250	40	-	-	-
		5	5	0.21	1.71	1525	102	102	102	858.43	862.27	3.84	14.0	101				-4.0	250	250	40	-	-	-
		5	5	0.21	1.72	1522	103	103	103	862.27	866.14	3.87	14.0	102				-4.0	250	250	40	-	-	-
		5	5	0.17	1.39	1522	104	104	104	866.14	869.62	3.48	12.6	101				-4.0	250	250	40	-	-	-
		5	5	0.17	1.44	1460	105	105	105	869.62	873.16	3.54	12.4	101				-4.0	250	250	40	-	-	-
		5	5	0.17	1.46	1436	106	106	106	873.16	876.67	3.51	12.3	100				-4.0	250	250	40	-	-	-
		5	5	0.17	1.47	1429	106	106	106	876.67	880.25	3.58	12.3	101				-4.0	250	250	40	-	-	-
		5	5	0.17	1.48	1421	107	107	107	880.25	883.85	3.60	12.3	102				-4.0	250	250	40	-	-	-

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ESSAI NUMÉRO	FACTEUR	MEL-COSV-1	QUANTITÉ	MEL-COSV-2	QUANTITÉ	MEL-COSV-3	QUANTITÉ	**MOYENNE**	**MOYENNE**
HORAIRE DES ESSAIS									
DATE DE L'ESSAI	DE TOXICITÉ	2018-09-22	PRÉLEVÉE,	2018-09-28	PRÉLEVÉE,	2018-09-29	PRÉLEVÉE,	**(1 à 3)**	**(1 à 3)**
DÉBUT DE L'ESSAI		13:44	EN	11:32	EN	16:13	EN	**EQUIVALENT**	**AVANT**
FIN DE L'ESSAI		17:44	EQUIVALENT	14:02	EQUIVALENT	19:13	EQUIVALENT	**TOTAUX**	**CORRECTION**
DUREE DE L'ESSAI (minutes)		240		150		180			
NOMBRE DE POINTS		48		30		36			
DONNÉES DES ÉQUIPEMENTS D'ÉCHANTILLONNAGE									
PRESSION BAROMÉTRIQUE ("Hg)		30.10		29.73		29.83			29.89
PRESSION STATIQUE ("H2O)		-0.08		-0.05		-0.05			-0.06
PRESSION STATIQUE (kPa)		-0.02		-0.01		-0.01			-0.01
COEFFICIENT DU COMPTEUR (19)		0.997		0.997		0.997			0.997
COEFFICIENT DU PITOT (03-06 3Q-371,03-06 3Q-503)		0.778		0.781		0.781			0.780
DIAMÈTRE DE LA BUSE (po) (3Q-371,3Q-503)		0.3741		0.4958		0.4958			0.4552
TEMPÉRATURE COMPTEUR (°F)		60		60		60			60
TEMPÉRATURE COMPTEUR (°C)		16		16		16			16
HUMIDITÉ DES GAZ & VOLUME ÉCHANTILLONNÉ									
MASSE D'EAU (g)		174.8		134.8		259.1			189.6
VOLUME D'EAU (pi^3)		8.39		6.47		12.44			9.10
HUMIDITÉ GAZ (BWO)		0.066		0.051		0.066			0.061
HUMIDITÉ GAZ (% v/v)		6.6		5.1		6.6			6.1
VOLUME GAZ REFERENCE (pi^{3}R)		119.19		119.67		176.29			138.38
VOLUME GAZ REFERENCE (m^{3}R)		**3.375**		**3.389**		**4.992**			**3.919**
CARACTÉRISTIQUES DU CONDUIT									
DIAMÈTRES AVANT LES TROUS D'ÉCHANTILLONNAG		5.0		5.0		5.00			5.0
DIAMÈTRES APRÈS LES TROUS D'ÉCHANTILLONNAG		2.0		2.0		2.00			2.0
DIAMÈTRE DU CONDUIT (pi)		2.71		2.71		2.71			2.71
DIAMÈTRE DU CONDUIT (m)		0.826		0.826		0.826			0.83
ÉPAISSEUR DU PORT D'ÉCHANTILLONNAGE (po)		7.5		7.5		7.5			
LONGUEUR DU CONDUIT (pi)		0.0		0.0		0.0			
LARGEUR DU CONDUIT (pi)		0.0		0.0		0.0			
PRESSION CONDUIT ("Hg)		30.09		29.73		29.83			29.88
PRESSION COMPTEUR ("Hg)		30.13		29.81		29.95			29.96
SURFACE DU CONDUIT (pi^2)		5.8		5.8		5.8			5.8
SURFACE DU CONDUIT (m^2)		0.54		0.54		0.54			0.54
CARACTÉRISTIQUES DES GAZ									
TEMPÉRATURE CHEMINÉE (°F)		1339		1333		1435			1369
TEMPÉRATURE CHEMINÉE (°C)		726.0		722.8		779.5			742.7
CO_2 (%vs)		5.2		4.4		5.6			5.1
O_2 (%vs)		14.1		15.1		13.6			14.3
O_2 (%vh)		13.2		14.3		12.7			13.4
CO (ppmvs)		3		3		3			3
SO_2 (%vs)		0		0		0			
N_2 (%vs)		80.6		80.5		80.8			81
Ar (%vs)		0.00		0.00		0.00			0.0
POIDS MOLECULAIRE SEC		29.40		29.31		29.44			29.39
POIDS MOLECULAIRE HUMIDE		28.65		28.73		28.69			28.69
VITESSE DES GAZ (pi/s)		38.3		34.8		45.6			39.6
VITESSE DES GAZ (m/s)		11.7		10.6		13.9			12.1
DEBIT GAZ ACTUELS (pi^3/h)		794 892		722 251		946 277			821 140
DEBIT GAZ ACTUELS (m^3/h)		22 509		20 452		26 796			23 252
DEBIT GAZ ACTUELS (pi^3/min)(APCM)		13 248		12 038		15 771			13 686
DEBIT GAZ NORMALISES (pi^{3}R/h)		222 994		203 892		249 680			225 522
DEBIT GAZ NORMALISES (m^{3}R/h)		**6 314**		**5 774**		**7 070**			**6 386**
DEBIT GAZ NORMALISES (pi^{3}R/min) (RPCM)		3 717		3 398		4 161			3 759
INFORMATIONS D'ÉCHANTILLONNAGE									
VITESSE MAXIMALE (m/s)		13.55		11.89		15.22			13.6
VITESSE MINIMALE (m/s)		9.45		9.25		12.42			10.4
10%Vmax (m/s)		1.35		1.19		1.52			1.4
Pourcentage >10%Vmax		75%		100%		100%			92%
NOMBRE POINTS ΔP 20% et + de ΔPmoy		12		5		0			
ISOCINÉTISME MOYEN (%)		101.1		100.9		101.2			101
% PTS RESPECT CRITERE ISO		100%		100%		100%			100%
DEBIT DE POMPAGE MAX (pi^3/min)		≤ 0.54		≤ 0.89		≤ 1.03			0.8
PRESSION DE VIDE MAX DURANT ESSAI (-"Hg)		-2		-6		-5			-4.00
TEMPÉRATURE SONDE MAX (°F)		250		250		254			251.33
TEMPÉRATURE SONDE MIN (°F)		250		235		238			241
TEMPÉRATURE FILTRE MAX (°F)		250		260		262			257
TEMPÉRATURE FILTRE MIN (°F)		250		244		243			246
TEMPÉRATURE SORTIE MAX (°F)		40		68		68			59
TEMPÉRATURE SORTIE MIN (°F)		40		68		66			58
TEMPÉRATURE TRAPPE MAX (°F)		40		58		56			51
TEMPÉRATURE TRAPPE MIN (°F)		40		43		40			41
DEBIT DE POMPAGE MOYEN (pi^3/min)		0.48		0.78		0.95			
4% DEBIT DE POMPAGE MOYEN (pi^3/min)		0.019		0.031		0.038			
TEST DE FUITE AVANT LES ESSAIS À 15 "Hg (pi^3/min)		< 0.020		< 0.020		< 0.020			
TEST DE FUITE APRÈS LES ESSAIS (pi^3/min)		< 0.020		< 0.020		< 0.020			0.020

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				HORAIRE DES ESSAIS					
ESSAI NUMÉRO	FACTEUR	MEL-COSV-1	QUANTITÉ	MEL-COSV-2	QUANTITÉ	MEL-COSV-3	QUANTITÉ	**MOYENNE**	**MOYENNE**
DATE DE L'ESSAI	DE TOXICITÉ	2018-09-22	PRÉLEVÉE,	2018-09-28	PRÉLEVÉE,	2018-09-29	PRÉLEVÉE,	**(1 à 3)**	**(1 à 3)**
DÉBUT DE L'ESSAI		13:44	EN	11:32	EN	16:13	EN	**EQUIVALENT**	**AVANT**
FIN DE L'ESSAI		17:44	EQUIVALENT	14:02	EQUIVALENT	19:13	EQUIVALENT	**TOTAUX**	**CORRECTION**
DUREE DE L'ESSAI (minutes)		240		150		180			
NOMBRE DE POINTS		48		30		36			
				DIOXINES ET FURANNES LIMITES DE DETECTION (pg)					
2,3,7,8 - Tetra CDD		1		2		7			3.3
1,2,3,7,8 - Penta CDD		3		9		10			7.3
1,2,3,4,7,8 - Hexa CDD		3		7		10			6.7
1,2,3,6,7,8 - Hexa CDD		3		6		10			6.3
1,2,3,7,8,9 - Hexa CDD		3		7		10			6.7
1,2,3,4,6,7,8 - Hepta CDD		6		10		10			8.7
1,2,3,4,6,7,8,9 - Octa CDD		20		10		20			16.7
2, 3, 7, 8 - Tetra CDF		4		6		9			6.3
1,2,3,7,8 - Penta CDF		8		9		20			12.3
2,3,4,7,8 - Penta CDF		6		7		10			7.7
1,2,3,4,7,8 - Hexa CDF		4		10		10			8.0
1,2,3,6,7,8 - Hexa CDF		4		10		10			8.0
2,3,4,6,7,8 - Hexa CDF		4		10		10			8.0
1,2,3,7,8,9 - Hexa CDF		6		20		20			15.3
1,2,3,4,6,7,8 - Hepta CDF		3		5		20			9.3
1,2,3,4,7,8,9 - Hepta CDF		6		8		20			11.3
1,2,3,4,6,7,8,9 - Octa CDF		9		7		30			15.3
Total Tetra CDD		1		2		7			3.3
Total Penta CDD		3		9		10			7.3
Total Hexa CDD		3		7		10			6.7
Total Hepta CDD		6		10		10			8.7
Sommation des PCDDs		20		10		20			16.7
Total Tetra CDF		4		6		9			6.3
Total Penta CDF		8		9		20			12.3
Total Hexa CDF		6		20		20			15.3
Total Hepta CDF		6		8		20			11.3
Sommation des PCDFs		9		20		30			19.7
				DIOXINES ET FURANNES (pg)					
2,3,7,8 - Tetra CDD	**1**	< 1.00	< LD	5.00	5.00	< 7.00	< LD	4.3	4.3
1,2,3,7,8 - Penta CDD	**1**	< 3.00	< LD	47.0	47.0	23.0	23.0	24.3	24.3
1,2,3,4,7,8 - Hexa CDD	**0.1**	< 3.00	< LD	53.0	5.30	28.0	2.80	2.80	28.0
1,2,3,6,7,8 - Hexa CDD	**0.1**	3.0	0.3	71.0	7.10	63.0	6.30	4.57	45.7
1,2,3,7,8,9 - Hexa CDD	**0.1**	< 3.00	< LD	81.0	8.10	65.0	6.50	4.97	49.7
1,2,3,4,6,7,8 - Hepta CDD	**0.01**	17.0	0.17	316.0	3.16	307.0	3.07	2.13	213.3
1,2,3,4,6,7,8,9 - Octa CDD	**0.0001**	33.0	0.0033	160.0	0.016	300.0	0.030	0.016	164.3
2, 3, 7, 8 - Tetra CDF	**0.1**	15.0	1.50	48.0	4.80	216.0	21.6	9.30	93.0
1,2,3,7,8 - Penta CDF	**0.05**	< 8.00	< LD	21.0	1.05	62.0	3.10	1.52	30.3
2,3,4,7,8 - Penta CDF	**0.5**	9.00	4.50	43.0	21.5	165.0	82.5	36.2	72.3
1,2,3,4,7,8 - Hexa CDF	**0.1**	13.0	1.30	62.0	6.20	326.0	32.6	13.4	133.7
1,2,3,6,7,8 - Hexa CDF	**0.1**	9.00	0.90	25.0	2.50	120.0	12.0	5.13	51.3
2,3,4,6,7,8 - Hexa CDF	**0.1**	8.00	0.80	50.0	5.00	273.0	27.3	11.0	110.3
1,2,3,7,8,9 - Hexa CDF	**0.1**	< 6.00	< LD	< 20.0	< LD	30.0	3.00	1.9	18.7
1,2,3,4,6,7,8 - Hepta CDF	**0.01**	16.0	0.16	64.0	0.64	474.0	4.74	1.85	184.7
1,2,3,4,7,8,9 - Hepta CDF	**0.01**	< 6.00	< LD	8.0	0.08	100.0	1.00	0.38	38.0
1,2,3,4,6,7,8,9 - Octa CDF	**0.0001**	20.0	0.0020	17.0	0.0017	227.0	0.023	0.0088	88.0
Total Tetra CDD	**MDDEFP**	9.00		159.0		214.0			127.3
Total Penta CDD		11.0		446.0		406.0			287.7
Total Hexa CDD		25.0		900.0		718.0			547.7
Total Hepta CDD		20.0		334.0		315.0			223.0
Sommation des PCDDs		99.0		2000.0		1950.0			1349.7
Total Tetra CDF		100.0		282.0		1140.0			507.3
Total Penta CDF		72.0		406.0		1540.0			672.7
Total Hexa CDF		32.0		172.0		963.0			389.0
Total Hepta CDF		28.0		123.0		880.0			343.7
Sommation des PCDFs		253.0		1000.0		4750.0			2001.0
ÉQUIVALENCE TOXIQUE TOTALE			**9.64**		**117.4**		**229.6**	**118.9**	
CONGÉNÈRES TOXIQUES TOTAUX		**173.0**		**1091.0**		**2786.0**			**1350.0**
GROUPES HOMOLOGUES TOTAUX		**649.0**		**5822.0**		**12876.0**			**6449.0**

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HORAIRE DES ESSAIS									
ESSAI NUMÉRO	FACTEUR	MEL-COSV-1	QUANTITÉ	MEL-COSV-2	QUANTITÉ	MEL-COSV-3	QUANTITÉ	**MOYENNE**	**MOYENNE**
DATE DE L'ESSAI	DE TOXICITÉ	2018-09-22	PRÉLEVÉE,	2018-09-28	PRÉLEVÉE,	2018-09-29	PRÉLEVÉE,	**(1 à 3)**	**(1 à 3)**
DÉBUT DE L'ESSAI		13:44	EN	11:32	EN	16:13	EN	**EQUIVALENT**	**AVANT**
FIN DE L'ESSAI		17:44	EQUIVALENT	14:02	EQUIVALENT	19:13	EQUIVALENT	**TOTAUX**	**CORRECTION**
DUREE DE L'ESSAI (minutes)		240		150		180			
NOMBRE DE POINTS		48		30		36			
DIOXINES ET FURANNES (ng/m³R)									
2,3,7,8 - Tetra CDD	**1**	< 0.00030	< LD	0.0015	0.0015	< 0.0014	< LD	0.0011	0.0011
1,2,3,7,8 - Penta CDD	**1**	< 0.00089	< LD	0.014	0.014	0.0046	0.0046	0.0065	0.0065
1,2,3,4,7,8 - Hexa CDD	**0.1**	< 0.00089	< LD	0.016	0.0016	0.0056	0.00056	0.00074	0.0074
1,2,3,6,7,8 - Hexa CDD	**0.1**	0.00089	0.000089	0.021	0.0021	0.013	0.0013	0.0011	0.011
1,2,3,7,8,9 - Hexa CDD	**0.1**	< 0.00089	< LD	0.024	0.0024	0.013	0.0013	0.0013	0.013
1,2,3,4,6,7,8 - Hepta CDD	**0.01**	0.0050	0.000050	0.093	0.00093	0.061	0.00061	0.00053	0.053
1,2,3,4,6,7,8,9 - Octa CDD	**0.0001**	0.0098	0.0000010	0.047	0.0000047	0.060	0.0000060	0.0000039	0.039
2, 3, 7, 8 - Tetra CDF	**0.1**	0.0044	0.00044	0.014	0.0014	0.043	0.0043	0.0021	0.021
1,2,3,7,8 - Penta CDF	**0.05**	< 0.0024	< LD	0.0062	0.00031	0.012	0.00062	0.00035	0.0070
2,3,4,7,8 - Penta CDF	**0.5**	0.0027	0.0013	0.013	0.0063	0.033	0.017	0.0081	0.016
1,2,3,4,7,8 - Hexa CDF	**0.1**	0.0039	0.00039	0.018	0.0018	0.065	0.0065	0.0029	0.029
1,2,3,6,7,8 - Hexa CDF	**0.1**	0.0027	0.00027	0.0074	0.00074	0.024	0.0024	0.0011	0.011
2,3,4,6,7,8 - Hexa CDF	**0.1**	0.0024	0.00024	0.015	0.0015	0.055	0.0055	0.0024	0.024
1,2,3,7,8,9 - Hexa CDF	**0.1**	< 0.0018	< LD	< 0.0059	< LD	0.0060	0.00060	0.00046	0.0046
1,2,3,4,6,7,8 - Hepta CDF	**0.01**	0.0047	0.000047	0.019	0.00019	0.095	0.00095	0.00040	0.040
1,2,3,4,7,8,9 - Hepta CDF	**0.01**	< 0.0018	< LD	0.0024	0.000024	0.020	0.00020	0.000081	0.0081
1,2,3,4,6,7,8,9 - Octa CDF	**0.0001**	0.0059	0.00000059	0.0050	0.00000050	0.045	0.0000045	0.0000019	0.019
Total Tetra CDD	**MDDEFP**	0.0027		0.047		0.043			0.031
Total Penta CDD		0.0033		0.13		0.081			0.072
Total Hexa CDD		0.0074		0.27		0.14			0.14
Total Hepta CDD		0.0059		0.099		0.063			0.056
Sommation des PCDDs		0.029		0.59		0.39			0.34
Total Tetra CDF		0.030		0.083		0.23			0.11
Total Penta CDF		0.021		0.12		0.31			0.15
Total Hexa CDF		0.0095		0.051		0.19			0.084
Total Hepta CDF		0.0083		0.036		0.18			0.074
Sommation des PCDFs		0.075		0.30		0.95			0.44
ÉQUIVALENCE TOXIQUE TOTALE			**0.0029**		**0.035**		**0.046**	**0.028**	
CONGÉNÈRES TOXIQUES TOTAUX		**0.051**		**0.32**		**0.56**			**0.31**
GROUPES HOMOLOGUES TOTAUX		**0.19**		**1.72**		**2.58**			**1.50**
DIOXINES ET FURANNES (ng/m³R) 11 % D'OXYGÈNE									
2,3,7,8 - Tetra CDD	**1**	< 0.00043	< LD	0.0025	0.0025	< 0.0019	< LD	0.0016	0.0016
1,2,3,7,8 - Penta CDD	**1**	< 0.0013	< LD	0.024	0.024	0.0062	0.0062	0.010	0.010
1,2,3,4,7,8 - Hexa CDD	**0.1**	< 0.0013	< LD	0.027	0.0027	0.0076	0.00076	0.0012	0.012
1,2,3,6,7,8 - Hexa CDD	**0.1**	0.0013	0.00013	0.036	0.0036	0.017	0.0017	0.0018	0.018
1,2,3,7,8,9 - Hexa CDD	**0.1**	< 0.0013	< LD	0.041	0.0041	0.018	0.0018	0.0020	0.020
1,2,3,4,6,7,8 - Hepta CDD	**0.01**	0.0074	0.000074	0.16	0.0016	0.083	0.00083	0.00083	0.083
1,2,3,4,6,7,8,9 - Octa CDD	**0.0001**	0.014	0.0000014	0.080	0.0000080	0.081	0.0000081	0.0000059	0.059
2, 3, 7, 8 - Tetra CDF	**0.1**	0.0065	0.00065	0.024	0.0024	0.059	0.0059	0.0030	0.030
1,2,3,7,8 - Penta CDF	**0.05**	< 0.0035	< LD	0.011	0.00053	0.017	0.00084	0.00051	0.010
2,3,4,7,8 - Penta CDF	**0.5**	0.0039	0.0020	0.022	0.011	0.045	0.022	0.012	0.023
1,2,3,4,7,8 - Hexa CDF	**0.1**	0.0056	0.00056	0.031	0.0031	0.088	0.0088	0.0042	0.042
1,2,3,6,7,8 - Hexa CDF	**0.1**	0.0039	0.00039	0.013	0.0013	0.033	0.0033	0.0016	0.016
2,3,4,6,7,8 - Hexa CDF	**0.1**	0.0035	0.00035	0.025	0.0025	0.074	0.0074	0.0034	0.034
1,2,3,7,8,9 - Hexa CDF	**0.1**	< 0.0026	< LD	< 0.010	< LD	0.0081	0.00081	0.00069	0.0069
1,2,3,4,6,7,8 - Hepta CDF	**0.01**	0.0069	0.000069	0.032	0.00032	0.13	0.0013	0.00056	0.056
1,2,3,4,7,8,9 - Hepta CDF	**0.01**	< 0.0026	< LD	0.0040	0.000040	0.027	0.00027	0.00011	0.011
1,2,3,4,6,7,8,9 - Octa CDF	**0.0001**	0.0087	0.00000087	0.0085	0.00000085	0.062	0.0000062	0.0000026	0.026
Total Tetra CDD	**MDDEFP**	0.0039		0.080		0.058			0.047
Total Penta CDD		0.0048		0.22		0.11			0.11
Total Hexa CDD		0.011		0.45		0.19			0.22
Total Hepta CDD		0.0087		0.17		0.085			0.087
Sommation des PCDDs		0.043		1.01		0.53			0.53
Total Tetra CDF		0.043		0.14		0.31			0.16
Total Penta CDF		0.031		0.20		0.42			0.22
Total Hexa CDF		0.014		0.086		0.26			0.12
Total Hepta CDF		0.012		0.062		0.24			0.10
Sommation des PCDFs		0.11		0.50		1.29			0.63
ÉQUIVALENCE TOXIQUE TOTALE			**0.0042**		**0.059**		**0.062**	**0.042**	
NORME AU PRMRQA	**0.08**								
CONGÉNÈRES TOXIQUES TOTAUX		**0.075**		**0.55**		**0.76**			**0.46**
GROUPES HOMOLOGUES TOTAUX		**0.28**		**2.93**		**3.49**			**2.23**

AEM Meliadine
18-5528
Incinérateur
COSV

HORAIRE DES ESSAIS									
ESSAI NUMÉRO DATE DE L'ESSAI DÉBUT DE L'ESSAI FIN DE L'ESSAI	FACTEUR DE TOXICITÉ	MEL-COSV-1 2018-09-22 13:44 17:44	QUANTITÉ PRÉLEVÉE, EN EQUIVALENT	MEL-COSV-2 2018-09-28 11:32 14:02	QUANTITÉ PRÉLEVÉE, EN EQUIVALENT	MEL-COSV-3 2018-09-29 16:13 19:13	QUANTITÉ PRÉLEVÉE, EN EQUIVALENT	**MOYENNE (1 à 3) EQUIVALENT TOTAUX**	**MOYENNE (1 à 3) AVANT CORRECTION**
DUREE DE L'ESSAI (minutes)		240		150		180			
NOMBRE DE POINTS		48		30		36			
DIOXINES ET FURANNES (µg/h)									
2,3,7,8 - Tetra CDD	**1**	< 0.0019	< LD	0.0085	0.0085	< 0.0099	< LD	0.0068	0.0068
1,2,3,7,8 - Penta CDD	**1**	< 0.0056	< LD	0.080	0.080	0.033	0.033	0.039	0.039
1,2,3,4,7,8 - Hexa CDD	**0.1**	< 0.0056	< LD	0.090	0.0090	0.040	0.0040	0.0045	0.045
1,2,3,6,7,8 - Hexa CDD	**0.1**	0.0056	0.00056	0.12	0.012	0.089	0.0089	0.0072	0.072
1,2,3,7,8,9 - Hexa CDD	**0.1**	< 0.0056	< LD	0.14	0.014	0.092	0.0092	0.0079	0.079
1,2,3,4,6,7,8 - Hepta CDD	**0.01**	0.032	0.00032	0.54	0.0054	0.43	0.0043	0.0034	0.34
1,2,3,4,6,7,8,9 - Octa CDD	**0.0001**	0.062	0.0000062	0.27	0.000027	0.42	0.000042	0.000025	0.25
2, 3, 7, 8 - Tetra CDF	**0.1**	0.028	0.0028	0.082	0.0082	0.31	0.031	0.014	0.14
1,2,3,7,8 - Penta CDF	**0.05**	< 0.015	< LD	0.036	0.0018	0.088	0.0044	0.0023	0.046
2,3,4,7,8 - Penta CDF	**0.5**	0.017	0.0084	0.073	0.037	0.23	0.12	0.054	0.11
1,2,3,4,7,8 - Hexa CDF	**0.1**	0.024	0.0024	0.11	0.011	0.46	0.046	0.020	0.20
1,2,3,6,7,8 - Hexa CDF	**0.1**	0.017	0.0017	0.043	0.0043	0.17	0.017	0.0076	0.076
2,3,4,6,7,8 - Hexa CDF	**0.1**	0.015	0.0015	0.085	0.0085	0.39	0.039	0.016	0.16
1,2,3,7,8,9 - Hexa CDF	**0.1**	< 0.011	< LD	< 0.034	< LD	0.042	0.0042	0.0029	0.029
1,2,3,4,6,7,8 - Hepta CDF	**0.01**	0.030	0.00030	0.11	0.0011	0.67	0.0067	0.0027	0.27
1,2,3,4,7,8,9 - Hepta CDF	**0.01**	< 0.011	< LD	0.014	0.00014	0.14	0.0014	0.00055	0.055
1,2,3,4,6,7,8,9 - Octa CDF	**0.0001**	0.037	0.0000037	0.029	0.0000029	0.32	0.000032	0.000013	0.13
Total Tetra CDD	**MDDELCC**	0.017		0.27		0.30			0.20
Total Penta CDD		0.021		0.76		0.58			0.45
Total Hexa CDD		0.047		1.5		1.0			0.87
Total Hepta CDD		0.037		0.57		0.45			0.35
Sommation des PCDDs		0.19		3.4		2.8			2.1
Total Tetra CDF		0.19		0.48		1.6			0.76
Total Penta CDF		0.13		0.69		2.2			1.0
Total Hexa CDF		0.060		0.29		1.4			0.57
Total Hepta CDF		0.052		0.21		1.2			0.50
Sommation des PCDFs		0.47		1.7		6.7			3.0
ÉQUIVALENCE TOXIQUE TOTALE			**0.018**		**0.20**		**0.33**	**0.18**	
CONGÉNÈRES TOXIQUES TOTAUX		**0.32**		**1.86**		**3.95**			**2.04**
GROUPES HOMOLOGUES TOTAUX		**1.21**		**9.92**		**18.2**			**9.79**

RELEVÉ D'ÉCHANTILLONNAGE: Incinérateur - COSV - ESSAI# MEL-COSV-1

Heure	Trav. #	Point #	Durée de pompage (min)	Différence de pression ("H_2O) ΔP	ΔH	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume de gaz (pi^3) Début	Fin	Total	Vitesse (m/s)	Iso. (%)	O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vacuum (po Hg)	Températures (°F) Sonde	Filtre	Sortie	Trappe F Cond	Aux3	Module
13 h 44	1	1	5	0.18	0.45	1330	60	60	76	483.04	485.51	2.47	12.4	98	14.1	5.2	3	-1.0	250	250	40	40	-	-
		1	5	0.17	0.43	1345	60	60	77	485.51	488.00	2.49	12.1	102				-1.0	250	250	40	40	-	-
		1	5	0.17	0.43	1345	60	60	77	488.00	490.46	2.46	12.1	101				-1.0	250	250	40	40	-	-
		1	5	0.17	0.43	1345	60	60	77	490.46	492.97	2.51	12.1	103				-1.0	250	250	40	40	-	-
		2	5	0.17	0.43	1352	60	60	78	492.97	495.48	2.51	12.1	103				-1.0	250	250	40	40	-	-
		2	5	0.17	0.43	1356	60	60	79	495.48	497.85	2.37	12.1	97				-1.0	250	250	40	40	-	-
		2	5	0.18	0.45	1354	60	60	80	497.85	500.35	2.50	12.5	100				-1.0	250	250	40	40	-	-
		2	5	0.18	0.45	1353	60	60	80	500.35	502.87	2.52	12.4	100				-1.0	250	250	40	40	-	-
		3	5	0.18	0.45	1361	60	60	82	502.87	505.38	2.51	12.5	100				-1.0	250	250	40	40	-	-
		3	5	0.21	0.53	1366	60	60	82	505.38	508.08	2.70	13.5	100				-1.0	250	250	40	40	-	-
		3	5	0.21	0.52	1381	60	60	84	508.08	510.79	2.71	13.5	101				-1.0	250	250	40	40	-	-
		3	5	0.21	0.52	1377	60	60	83	510.79	513.50	2.71	13.5	101				-1.5	250	250	40	40	-	-
		4	5	0.21	0.52	1379	60	60	84	513.50	516.20	2.70	13.5	100				-1.5	250	250	40	40	-	-
		4	5	0.21	0.52	1380	60	60	85	516.20	518.88	2.68	13.5	100				-1.5	250	250	40	40	-	-
		4	5	0.21	0.53	1373	60	60	85	518.88	521.61	2.73	13.5	101				-1.5	250	250	40	40	-	-
		4	5	0.21	0.53	1373	60	60	85	521.61	524.28	2.67	13.5	99				-1.5	250	250	40	40	-	-
		5	5	0.18	0.46	1347	60	60	87	524.28	526.84	2.56	12.4	102				-1.5	250	250	40	40	-	-
		5	5	0.18	0.46	1348	60	60	87	526.84	529.27	2.43	12.4	97				-1.5	250	250	40	40	-	-
		5	5	0.18	0.46	1350	60	60	88	529.27	531.82	2.55	12.4	101				-1.5	250	250	40	40	-	-
		5	5	0.18	0.46	1354	60	60	88	531.82	534.26	2.44	12.5	97				-1.5	250	250	40	40	-	-
		6	5	0.18	0.46	1355	60	60	88	534.26	536.79	2.53	12.5	101				-1.5	250	250	40	40	-	-
		6	5	0.18	0.46	1359	60	60	90	536.79	539.34	2.55	12.5	102				-1.5	250	250	40	40	-	-
		6	5	0.18	0.46	1361	60	60	90	539.34	541.87	2.53	12.5	101				-1.5	250	250	40	40	-	-
		6	5	0.17	0.44	1350	60	60	90	541.87	544.36	2.49	12.1	102				-1.5	250	250	40	40	-	-
	2	6	5	0.15	0.38	1357	60	60	93	544.36	546.67	2.31	11.4	101				-1.5	250	250	40	40	-	-
		6	5	0.16	0.41	1350	60	60	93	546.67	549.00	2.33	11.7	98				-1.5	250	250	40	40	-	-
		6	5	0.16	0.41	1355	60	60	94	549.00	551.26	2.26	11.7	96				-1.5	250	250	40	40	-	-
		6	5	0.16	0.41	1352	60	60	96	551.26	553.57	2.31	11.7	98				-1.5	250	250	40	40	-	-
		5	5	0.16	0.42	1348	60	60	97	553.57	555.93	2.36	11.7	100				-1.5	250	250	40	40	-	-
		5	5	0.16	0.41	1350	60	60	97	555.93	558.42	2.49	11.7	105				-1.5	250	250	40	40	-	-
		5	5	0.16	0.42	1345	60	60	97	558.42	560.77	2.35	11.7	99				-1.5	250	250	40	40	-	-
		5	5	0.15	0.39	1340	60	60	98	560.77	563.08	2.31	11.3	100				-1.5	250	250	40	40	-	-
		4	5	0.15	0.39	1332	60	60	99	563.08	565.37	2.29	11.3	99				-1.5	250	250	40	40	-	-
		4	5	0.13	0.35	1280	60	60	100	565.37	567.67	2.30	10.4	106				-1.5	250	250	40	40	-	-
		4	5	0.13	0.35	1300	60	60	100	567.67	569.98	2.31	10.4	107				-1.5	250	250	40	40	-	-
		4	5	0.11	0.29	1306	60	60	101	569.98	572.08	2.10	9.6	106				-1.5	250	250	40	40	-	-
		3	5	0.11	0.29	1304	60	60	101	572.08	574.08	2.00	9.6	100				-0.5	250	250	40	40	-	-
		3	5	0.11	0.30	1280	60	60	102	574.08	576.10	2.02	9.5	101				0.5	250	250	40	40	-	-
		3	5	0.11	0.30	1250	60	60	102	576.10	578.09	1.99	9.5	98				1.5	250	250	40	40	-	-
		3	5	0.11	0.30	1266	60	60	103	578.09	580.17	2.08	9.5	103				2.5	250	250	40	40	-	-
		2	5	0.13	0.35	1318	60	60	103	580.17	582.40	2.23	10.5	103				3.5	250	250	40	40	-	-
		2	5	0.13	0.35	1320	60	60	103	582.40	584.62	2.22	10.5	103				4.5	250	250	40	40	-	-
		2	5	0.13	0.35	1324	60	60	103	584.62	586.87	2.25	10.5	105				5.5	250	250	40	40	-	-
		2	5	0.13	0.35	1310	60	60	102	586.87	589.10	2.23	10.5	103				6.5	250	250	40	40	-	-
		1	5	0.13	0.35	1317	60	60	102	589.10	591.32	2.22	10.5	103				7.5	250	250	40	40	-	-
		1	5	0.13	0.35	1317	60	60	102	591.32	593.56	2.24	10.5	104				8.5	250	250	40	40	-	-
		1	5	0.13	0.35	1318	60	60	102	593.56	595.76	2.20	10.5	102				9.5	250	250	40	40	-	-
		1	5	0.13	0.35	1326	60	60	103	595.76	598.00	2.24	10.5	104				10.5	250	250	40	40	-	-

RELEVÉ D'ÉCHANTILLONNAGE: Incinérateur - COSV - ESSAI# MEL-COSV-2

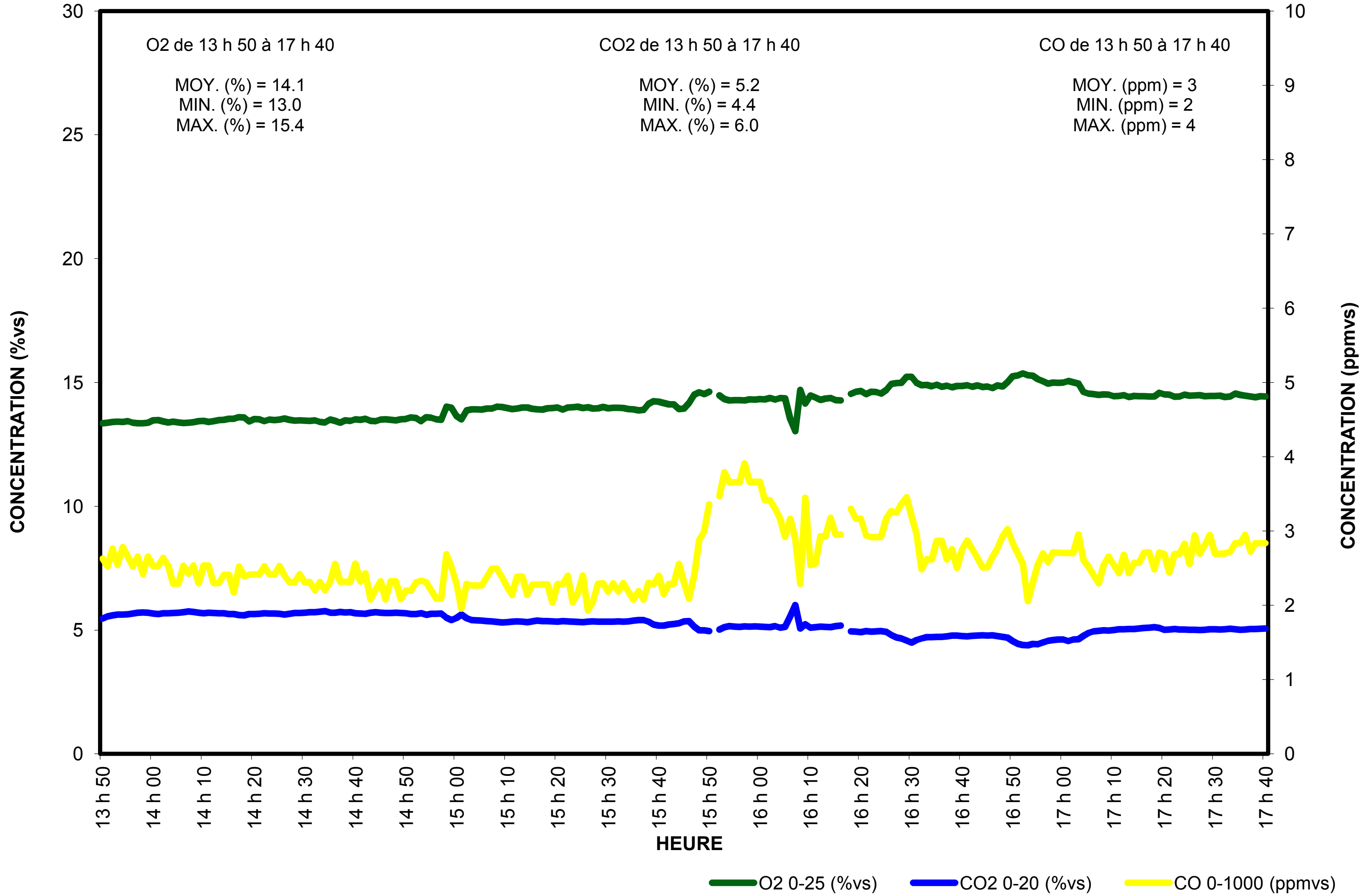
Heure	Trav. #	Point #	Durée de pompage (min)	Différence de pression ("H_2O) ΔP	ΔH	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume de gaz (pi^3) Début	Fin	Total	Vitesse (m/s)	Iso. (%)	O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vacuum (po Hg)	Températures (°F) Sonde	Filtre	Sortie	Trappe F Cond	Aux3	Module
11 h 32	1	6	5	0.16	1.28	1275	60	60	72	600.12	604.57	4.45	11.6	102	15.1	4.4	3	-5.0	246	253	68	44	-	-
		6	5	0.15	1.15	1353	60	60	73	604.57	608.84	4.27	11.5	104				-5.0	246	247	68	48	-	-
		6	5	0.15	1.15	1360	60	60	73	608.84	612.97	4.13	11.5	101				-5.0	247	253	68	49	-	-
		5	5	0.15	1.15	1362	60	60	74	612.97	617.11	4.14	11.5	101				-5.0	247	246	68	51	-	-
		5	5	0.15	1.15	1369	60	60	75	617.11	621.25	4.14	11.5	101				-5.5	249	251	68	52	-	-
		5	5	0.15	1.16	1362	60	60	77	621.25	625.40	4.15	11.5	101				-5.5	245	253	68	57	-	-
		4	5	0.16	1.23	1369	60	60	77	625.40	629.66	4.26	11.9	101				-5.5	248	250	68	52	-	-
		4	5	0.15	1.16	1371	60	60	79	629.66	633.81	4.15	11.5	101				-5.5	249	256	68	46	-	-
		4	5	0.15	1.16	1372	60	60	80	633.81	637.92	4.11	11.5	100				-5.5	249	255	68	47	-	-
		3	5	0.15	1.16	1369	60	60	81	637.92	642.08	4.16	11.5	102				-5.5	247	254	68	47	-	-
		3	5	0.15	1.17	1370	60	60	83	642.08	646.17	4.09	11.5	100				-5.5	247	247	68	48	-	-
		3	5	0.15	1.17	1373	60	60	84	646.17	650.31	4.14	11.5	101				-5.5	245	251	68	49	-	-
		2	5	0.13	1.05	1315	60	60	86	650.31	654.36	4.05	10.6	105				-5.5	249	249	68	50	-	-
		2	5	0.13	1.04	1320	60	60	86	654.36	658.15	3.79	10.6	98				-5.5	246	250	68	52	-	-
		2	5	0.12	0.97	1316	60	60	88	658.15	661.97	3.82	10.1	103				-5.5	248	251	68	55	-	-
		1	5	0.12	0.97	1314	60	60	89	661.97	665.75	3.78	10.1	102				-5.5	247	246	68	58	-	-
		1	5	0.12	0.97	1318	60	60	90	665.75	669.50	3.75	10.2	101				-5.5	250	251	68	54	-	-
		1	5	0.12	0.97	1318	60	60	91	669.50	673.25	3.75	10.2	101				-5.0	235	253	68	46	-	-
	2	1	5	0.12	0.98	1318	60	60	92	673.25	677.00	3.75	10.2	101				-5.0	250	249	68	43	-	-
		1	5	0.12	0.98	1311	60	60	94	677.00	680.74	3.74	10.1	100				-5.0	249	256	68	43	-	-
		1	5	0.12	0.99	1300	60	60	94	680.74	684.49	3.75	10.1	100				-4.5	249	251	68	44	-	-
		2	5	0.12	0.98	1317	60	60	95	684.49	688.23	3.74	10.1	101				-5.5	250	250	68	46	-	-
		2	5	0.12	0.98	1322	60	60	96	688.23	691.97	3.74	10.2	101				-5.5	246	253	68	48	-	-
		2	5	0.12	0.98	1318	60	60	96	691.97	695.73	3.76	10.2	101				-5.5	247	258	68	50	-	-
		3	5	0.12	0.98	1325	60	60	97	695.73	699.41	3.68	10.2	99				-5.5	250	244	68	52	-	-
		3	5	0.11	0.90	1320	60	60	98	699.41	703.00	3.59	9.7	101				-5.5	249	260	68	56	-	-
		3	5	0.11	0.90	1318	60	60	98	703.00	706.58	3.58	9.7	101				-5.5	249	247	68	58	-	-
		4	5	0.10	0.83	1310	60	60	100	706.58	709.94	3.36	9.2	99				-5.5	248	247	68	52	-	-
		4	5	0.10	0.83	1310	60	60	100	709.94	713.35	3.41	9.2	100				-5.5	249	250	68	45	-	-
		4	5	0.10	0.83	1314	60	60	101	713.35	716.79	3.44	9.3	101				-5.5	248	249	68	44	-	-

RELEVÉ D'ÉCHANTILLONNAGE: Incinérateur - COSV - ESSAI# MEL-COSV-3

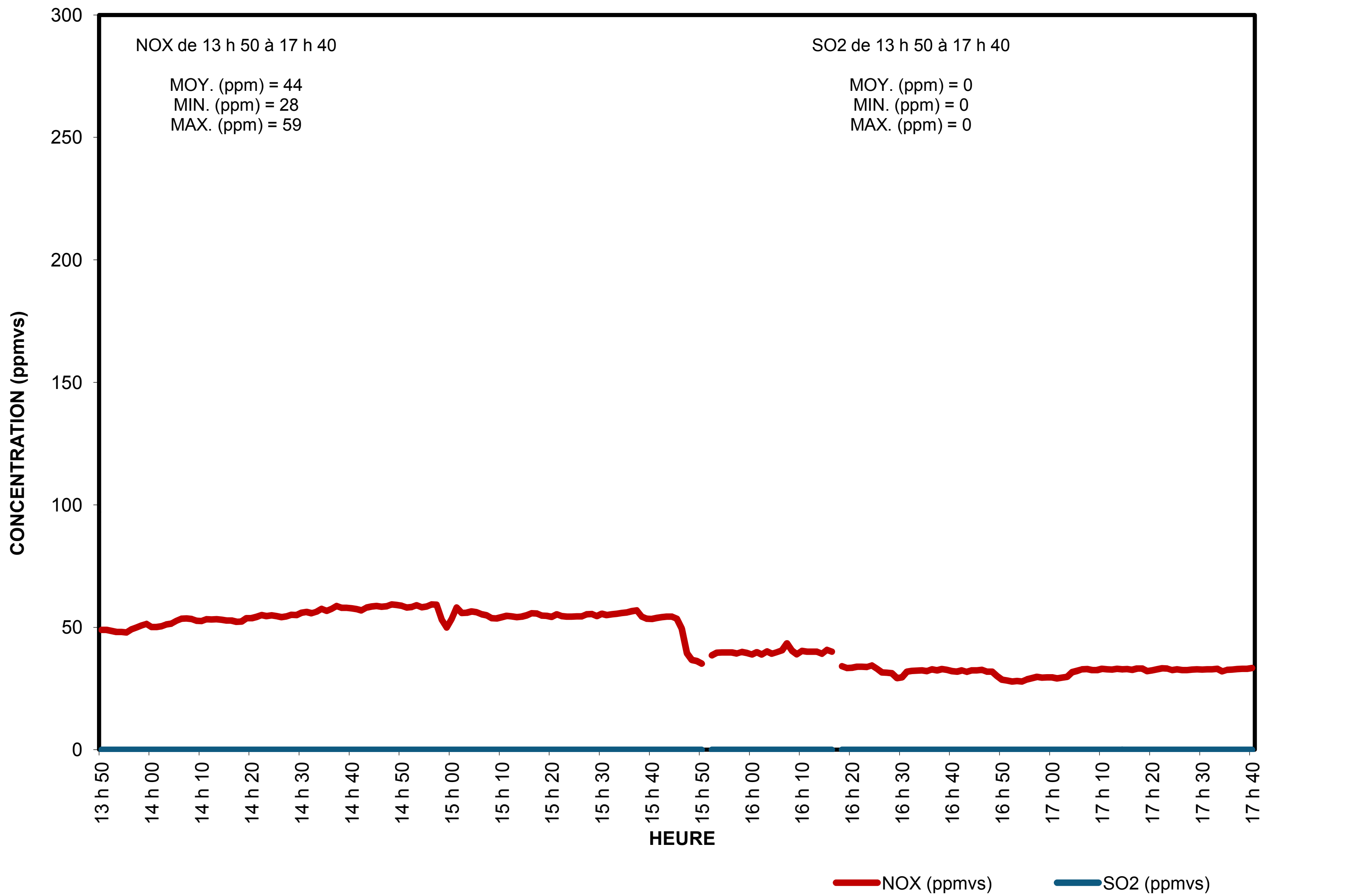
Heure	Trav. #	Point #	Durée de pompage (min)	Différence de pression ("H_2O) ΔP	ΔH	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume de gaz (pi^3) Début	Fin	Total	Vitesse (m/s)	Iso. (%)	O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vacuum (po Hg)	Températures (°F) Sonde	Filtre	Sortie	Trappe F Cond	Aux3	Module
16 h 13	1	6	5	0.24	1.85	1356	60	60	75	729.20	734.29	5.09	14.5	100	13.6	5.6	3	-4.5	250	251	68	52	-	-
		6	5	0.24	1.83	1377	60	60	76	734.29	739.45	5.16	14.6	102				-4.5	244	252	68	42	-	-
		6	5	0.24	1.82	1386	60	60	76	739.45	744.61	5.16	14.6	102				-4.5	247	252	68	40	-	-
		5	5	0.24	1.83	1385	60	60	78	744.61	749.76	5.15	14.6	102				-4.5	253	250	68	40	-	-
		5	5	0.24	1.82	1405	60	60	79	749.76	754.91	5.15	14.7	102				-4.5	247	253	68	40	-	-
		5	5	0.24	1.81	1410	60	60	80	754.91	760.08	5.17	14.7	103				-4.5	245	247	68	41	-	-
		4	5	0.21	1.63	1366	60	60	81	760.08	764.98	4.90	13.6	103				-4.5	240	247	67	41	-	-
		4	5	0.23	1.77	1380	60	60	82	764.98	770.00	5.02	14.3	101				-4.5	252	252	66	42	-	-
		4	5	0.23	1.77	1387	60	60	82	770.00	775.00	5.00	14.3	101				-4.0	252	243	66	42	-	-
		3	5	0.23	1.76	1396	60	60	83	775.00	780.01	5.01	14.3	101				-4.0	251	262	66	42	-	-
		3	5	0.23	1.76	1403	60	60	84	780.01	785.00	4.99	14.4	101				-4.0	249	250	66	43	-	-
		3	5	0.23	1.75	1409	60	60	84	785.00	789.95	4.95	14.4	100				-4.5	254	244	66	44	-	-
		2	5	0.18	1.39	1382	60	60	84	789.95	794.45	4.50	12.6	102				-4.5	244	251	66	44	-	-
		2	5	0.19	1.48	1381	60	60	86	794.45	799.04	4.59	13.0	102				-4.5	249	250	67	45	-	-
		2	5	0.18	1.40	1387	60	60	87	799.04	803.50	4.46	12.7	102				-4.5	250	251	67	48	-	-
		1	5	0.18	1.40	1380	60	60	87	803.50	807.95	4.45	12.6	101				-4.0	253	250	68	50	-	-
		1	5	0.18	1.39	1400	60	60	88	807.95	812.39	4.44	12.7	101				-4.0	238	250	66	41	-	-
		1	5	0.18	1.38	1410	60	60	89	812.39	816.86	4.47	12.7	102				-4.5	252	253	66	40	-	-
	2	1	5	0.18	1.38	1413	60	60	90	816.86	821.26	4.40	12.8	101				-4.5	250	252	68	40	-	-
		1	5	0.18	1.38	1417	60	60	90	821.26	825.67	4.41	12.8	101				-4.5	250	252	68	47	-	-
		1	5	0.17	1.30	1423	60	60	91	825.67	829.97	4.30	12.4	102				-4.5	245	248	68	49	-	-
		2	5	0.17	1.30	1440	60	60	94	829.97	834.30	4.33	12.5	103				-4.0	247	251	68	49	-	-
		2	5	0.17	1.29	1438	60	60	92	834.30	838.54	4.24	12.5	101				-4.0	252	247	68	49	-	-
		2	5	0.17	1.30	1443	60	60	94	838.54	842.77	4.23	12.5	101				-4.0	249	251	68	51	-	-
		3	5	0.17	1.29	1450	60	60	95	842.77	847.00	4.23	12.5	101				-4.0	250	250	68	51	-	-
		3	5	0.24	1.75	1529	60	60	95	847.00	851.90	4.90	15.2	100				-4.0	243	251	68	54	-	-
		3	5	0.24	1.75	1535	60	60	97	851.90	856.84	4.94	15.2	101				-4.0	245	251	68	54	-	-
		4	5	0.24	1.76	1533	60	60	97	856.84	861.77	4.93	15.2	101				-4.0	253	255	68	56	-	-
		4	5	0.24	1.76	1533	60	60	98	861.77	866.72	4.95	15.2	102				-4.0	241	250	68	56	-	-
		4	5	0.24	1.75	1542	60	60	98	866.72	871.64	4.92	15.2	101				-4.0	252	249	68	56	-	-
		5	5	0.24	1.76	1541	60	60	99	871.64	876.54	4.90	15.2	101				-5.0	248	249	68	56	-	-
		5	5	0.23	1.68	1548	60	60	101	876.54	881.29	4.75	14.9	100				-5.0	251	248	68	51	-	-
		5	5	0.22	1.65	1500	60	60	101	881.29	886.00	4.71	14.4	100				-4.0	252	252	68	50	-	-
		6	5	0.22	1.68	1463	60	60	102	886.00	890.71	4.71	14.3	99				-4.0	254	251	68	51	-	-
		6	5	0.22	1.69	1457	60	60	103	890.71	895.49	4.78	14.3	100				-5.0	254	251	68	54	-	-
		6	5	0.22	1.69	1460	60	60	103	895.49	900.26	4.77	14.3	100				-5.0	248	255	68	55	-	-

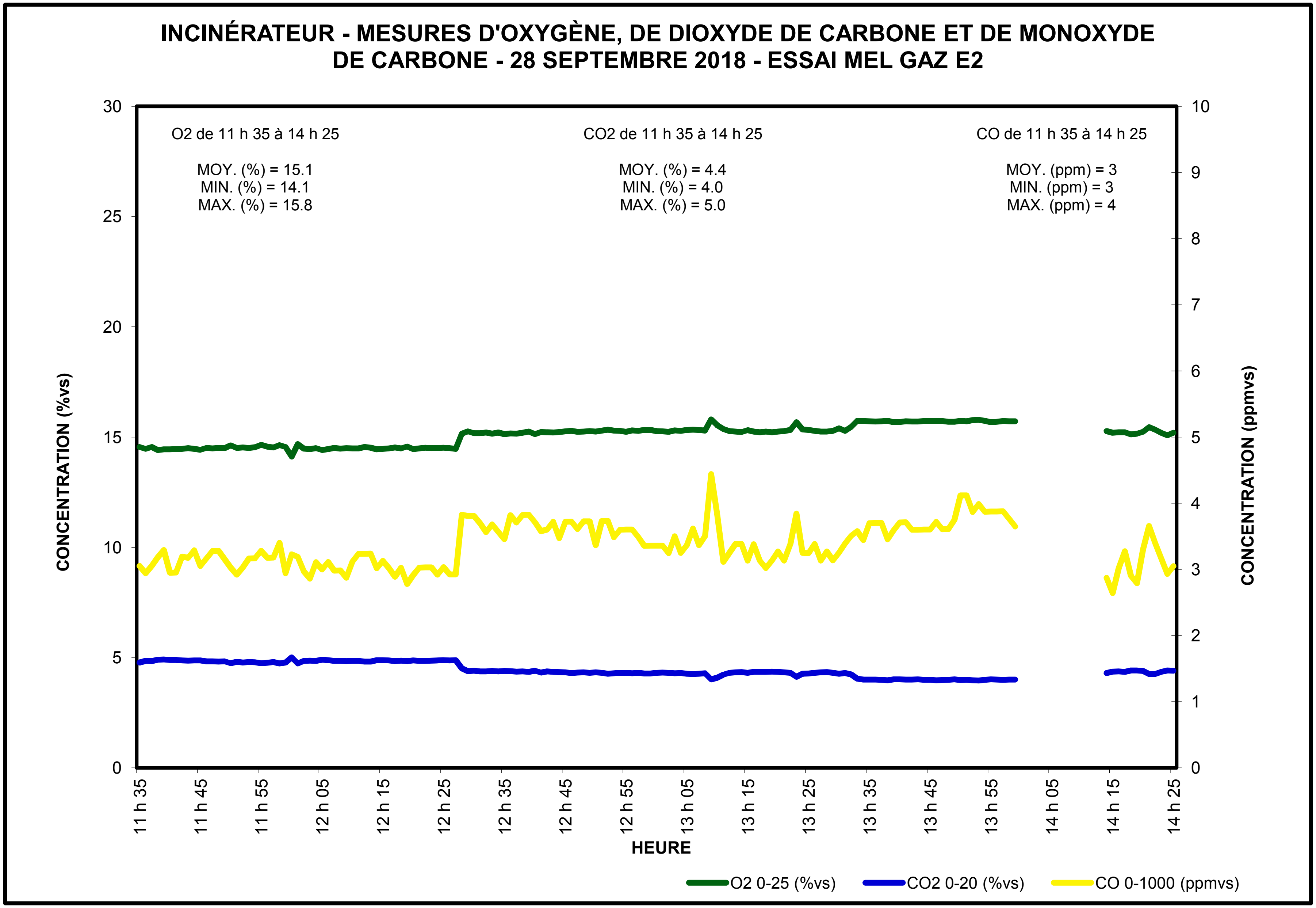
APPENDIX 2
CONTINUOUS MEASUREMENTS OF GAS

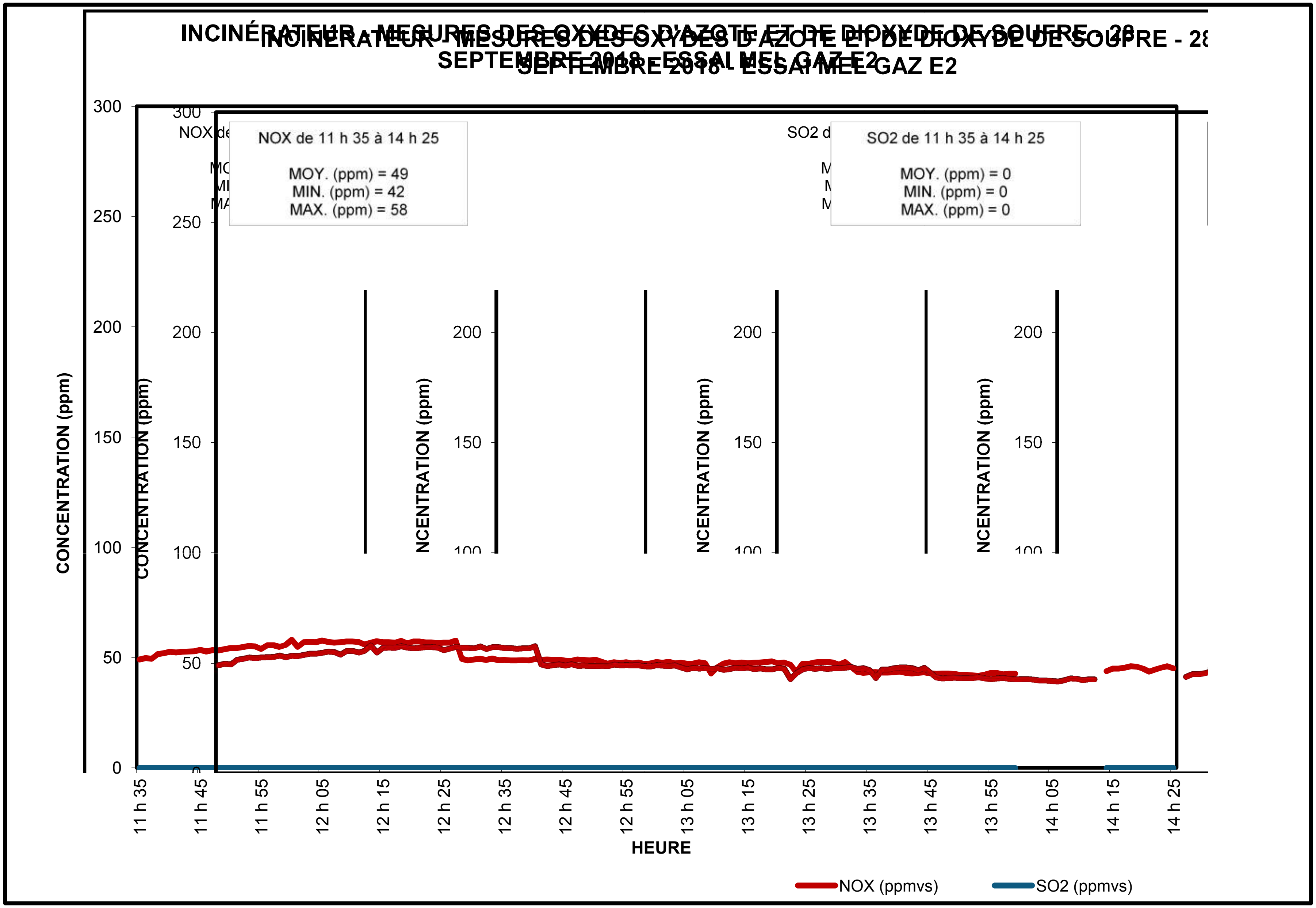
INCINÉRATEUR - MESURES D'OXYGÈNE, DE DIOXYDE DE CARBONE ET DE MONOXYDE DE CARBONE - 22 SEPTEMBRE 2018 - ESSAI MEL GAZ E1

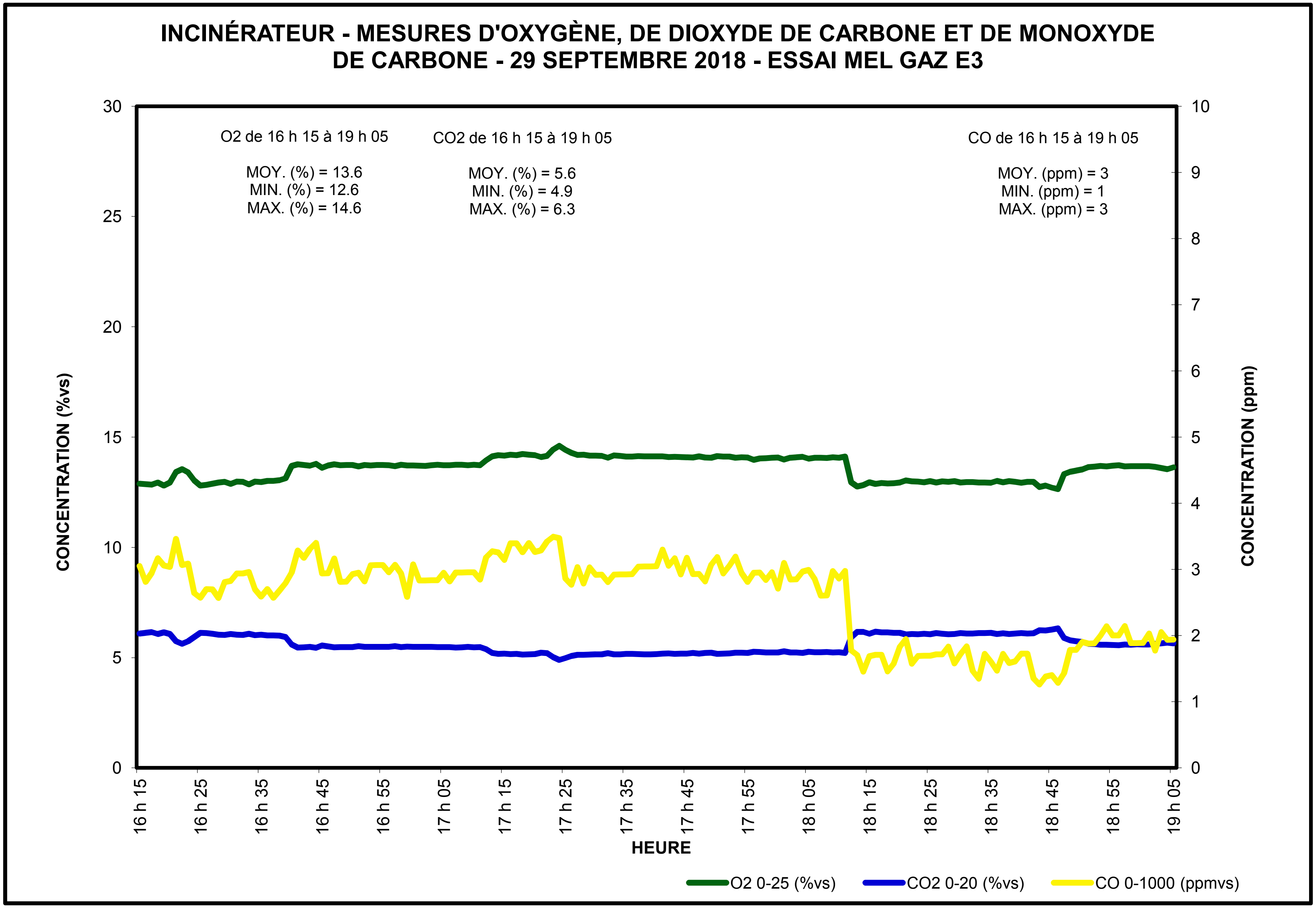


INCINÉRATEUR - MESURES DES OXYDES D'AZOTE ET DE DIOXYDE DE SOUFRE - 22 SEPTEMBRE 2018 - ESSAI MEL GAZ E1

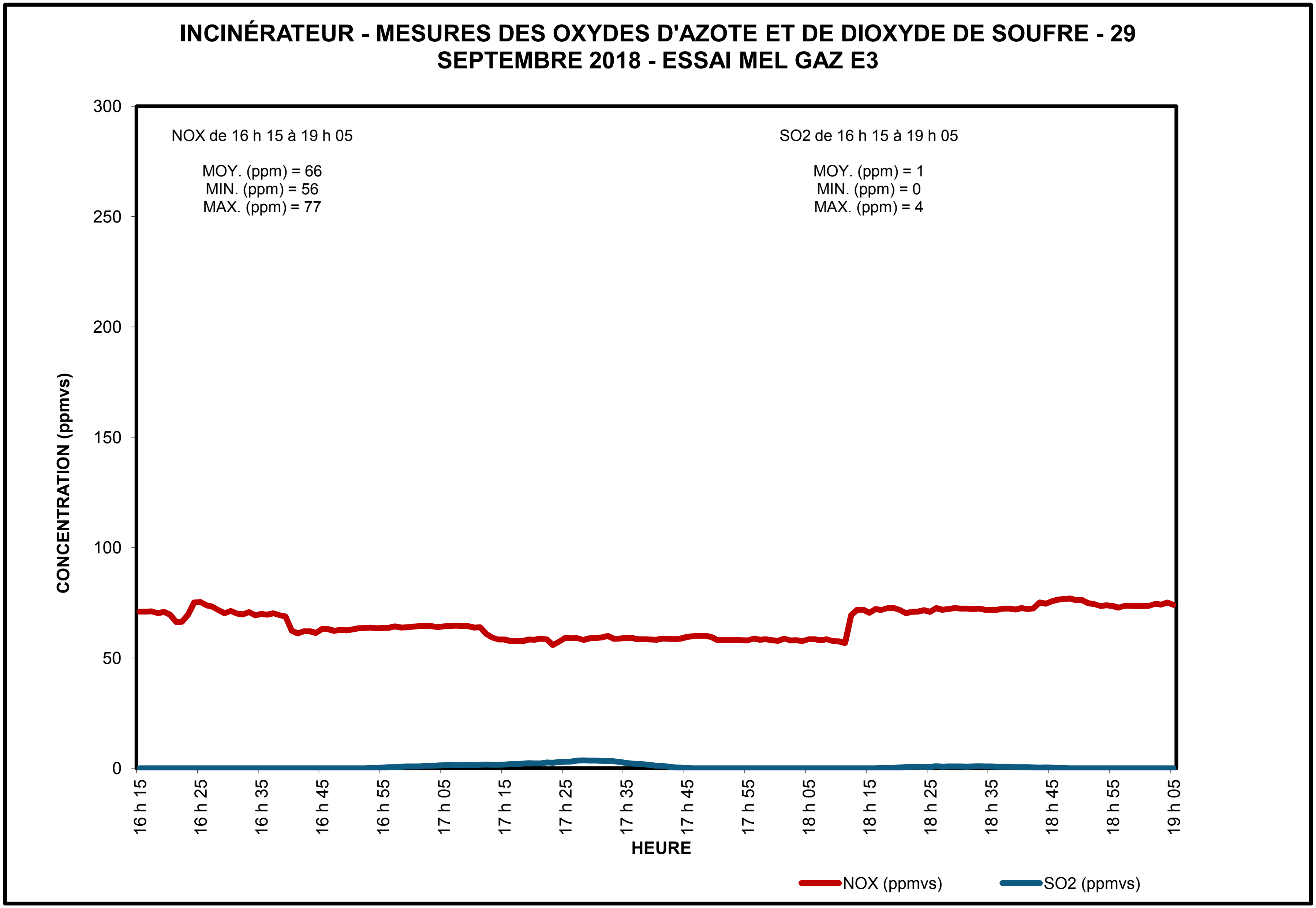



INCINÉRATEUR - MESURES D'OXYGÈNE, DE DIOXYDE DE CARBONE ET DE MONOXYDE DE CARBONE - 28 SEPTEMBRE 2018 - ESSAI MEL GAZ E2
O2 de 11 h 35 à 14 h 25
MOY. (%) = 15.1
MIN. (%) = 14.1
MAX. (%) = 15.8
CO2 de 11 h 35 à 14 h 25
MOY. (%) = 4.4
MIN. (%) = 4.0
MAX. (%) = 5.0
CO de 11 h 35 à 14 h 25
MOY. (ppm) = 3
MIN. (ppm) = 3
MAX. (ppm) = 4
CONCENTRATION (%vs)
CONCENTRATION (ppmvs)
0
5
10
15
20
25
30
0
1
2
3
4
5
6
7
8
9
10
11 h 35
11 h 45
11 h 55
12 h 05
12 h 15
12 h 25
12 h 35
12 h 45
12 h 55
13 h 05
13 h 15
13 h 25
13 h 35
13 h 45
13 h 55
14 h 05
14 h 15
14 h 25
HEURE
O2 0-25 (%vs)
CO2 0-20 (%vs)
CO 0-1000 (ppmvs)


INCINÉRATEUR - MESURES DES OXYDES D'AZOTE ET DE DIOXYDE DE SOUFRE - 28 SEPTEMBRE 2018 - ESSAI MEL GAZ E2
NOX de 11 h 35 à 14 h 25
MOY. (ppm) = 49
MIN. (ppm) = 42
MAX. (ppm) = 58
SO2 de 11 h 35 à 14 h 25
MOY. (ppm) = 0
MIN. (ppm) = 0
MAX. (ppm) = 0
CONCENTRATION (ppm)
HEURE
NOX (ppmvs)
SO2 (ppmvs)



INCINÉRATEUR - MESURES D'OXYGÈNE, DE DIOXYDE DE CARBONE ET DE MONOXYDE DE CARBONE - 29 SEPTEMBRE 2018 - ESSAI MEL GAZ E3
O2 de 16 h 15 à 19 h 05
MOY. (%) = 13.6
MIN. (%) = 12.6
MAX. (%) = 14.6
CO2 de 16 h 15 à 19 h 05
MOY. (%) = 5.6
MIN. (%) = 4.9
MAX. (%) = 6.3
CO de 16 h 15 à 19 h 05
MOY. (ppm) = 3
MIN. (ppm) = 1
MAX. (ppm) = 3
CONCENTRATION (%vs)
CONCENTRATION (ppm)
HEURE
16 h 15
16 h 25
16 h 35
16 h 45
16 h 55
17 h 05
17 h 15
17 h 25
17 h 35
17 h 45
17 h 55
18 h 05
18 h 15
18 h 25
18 h 35
18 h 45
18 h 55
19 h 05
O2 0-25 (%vs)
CO2 0-20 (%vs)
CO 0-1000 (ppmvs)


INCINÉRATEUR - MESURES DES OXYDES D'AZOTE ET DE DIOXYDE DE SOUFRE - 29 SEPTEMBRE 2018 - ESSAI MEL GAZ E3
NOX de 16 h 15 à 19 h 05
MOY. (ppm) = 66
MIN. (ppm) = 56
MAX. (ppm) = 77
SO2 de 16 h 15 à 19 h 05
MOY. (ppm) = 1
MIN. (ppm) = 0
MAX. (ppm) = 4
CONCENTRATION (ppmvs)
300
250
200
150
100
50
0
16 h 15
16 h 25
16 h 35
16 h 45
16 h 55
17 h 05
17 h 15
17 h 25
17 h 35
17 h 45
17 h 55
18 h 05
18 h 15
18 h 25
18 h 35
18 h 45
18 h 55
19 h 05
HEURE
NOX (ppmvs)
SO2 (ppmvs)

	AQ	AR	AS	AT
1		Graphique		
2	**22 sept. 2018**	**2018-09-22**	**2018-09-28**	**2018-09-29**
3	**ESSAIS**	**MEL GAZ E1**	**MEL GAZ E2**	**MEL GAZ E3**
4	**Début**	13 h 50	11 h 35	16 h 15
5	**Fin**	17 h 40	14 h 25	19 h 05
6	**O2 0-25 (%vs) corrigé**	**#1**	**#2**	**#3**
7	**MOY.**	14.1	15.1	13.6
8	**MIN**	13.0	14.1	12.6
9	**MAX**	15.4	15.8	14.6
10	**CO2 0-20 (%vs) corrigé**	**#1**	**#2**	**#3**
11	**MOY.**	5.2	4.4	5.6
12	**MIN**	4.4	4.0	4.9
13	**MAX**	6.0	5.0	6.3
14	**CO 0-1000 (ppmvs) corrigé**	**#1**	**#2**	**#3**
15	**MOY.**	2.6	3.4	2.6
16	**MIN**	1.9	2.6	1.3
17	**MAX**	3.9	4.4	3.5
18	**SO2 (ppmvs) corrigé**	**#1**	**#2**	**#3**
19	**MOY.**	0.0	0.0	0.6
20	**MIN**	0.0	0.0	0.0
21	**MAX**	0.0	0.0	3.6
22	**NOX (ppmvs) corrigé**	**#1**	**#2**	**#3**
23	**MOY.**	44.5	49.3	65.8
24	**MIN**	27.9	41.8	55.8
25	**MAX**	59.4	58.1	76.9

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
7	22-09-2018 13:50:15	13 h 50	13.4	5.5	2.6	0.0	49.0
8	22-09-2018 13:51:15	13 h 51	13.4	5.6	2.5	0.0	49.0
9	22-09-2018 13:52:15	13 h 52	13.4	5.6	2.8	0.0	48.6
10	22-09-2018 13:53:15	13 h 53	13.4	5.6	2.5	0.0	48.1
11	22-09-2018 13:54:15	13 h 54	13.4	5.6	2.8	0.0	48.2
12	22-09-2018 13:55:15	13 h 55	13.4	5.6	2.7	0.0	47.9
13	22-09-2018 13:56:15	13 h 56	13.4	5.7	2.5	0.0	49.2
14	22-09-2018 13:57:15	13 h 57	13.4	5.7	2.7	0.0	49.9
15	22-09-2018 13:58:15	13 h 58	13.4	5.7	2.4	0.0	50.8
16	22-09-2018 13:59:15	13 h 59	13.4	5.7	2.7	0.0	51.4
17	22-09-2018 14:00:15	14 h 00	13.5	5.7	2.5	0.0	50.1
18	22-09-2018 14:01:15	14 h 01	13.5	5.6	2.5	0.0	50.1
19	22-09-2018 14:02:15	14 h 02	13.4	5.7	2.6	0.0	50.4
20	22-09-2018 14:03:15	14 h 03	13.4	5.7	2.5	0.0	51.1
21	22-09-2018 14:04:15	14 h 04	13.4	5.7	2.3	0.0	51.5
22	22-09-2018 14:05:15	14 h 05	13.4	5.7	2.3	0.0	52.6
23	22-09-2018 14:06:15	14 h 06	13.4	5.7	2.5	0.0	53.5
24	22-09-2018 14:07:15	14 h 07	13.4	5.8	2.4	0.0	53.7
25	22-09-2018 14:08:15	14 h 08	13.4	5.7	2.5	0.0	53.4
26	22-09-2018 14:09:15	14 h 09	13.4	5.7	2.3	0.0	52.7
27	22-09-2018 14:10:15	14 h 10	13.4	5.7	2.5	0.0	52.6
28	22-09-2018 14:11:15	14 h 11	13.4	5.7	2.5	0.0	53.3
29	22-09-2018 14:12:15	14 h 12	13.4	5.7	2.3	0.0	53.2
30	22-09-2018 14:13:15	14 h 13	13.5	5.7	2.3	0.0	53.3
31	22-09-2018 14:14:15	14 h 14	13.5	5.7	2.4	0.0	53.0
32	22-09-2018 14:15:15	14 h 15	13.5	5.7	2.4	0.0	52.8
33	22-09-2018 14:16:15	14 h 16	13.5	5.6	2.2	0.0	52.8
34	22-09-2018 14:17:15	14 h 17	13.6	5.6	2.5	0.0	52.2
35	22-09-2018 14:18:15	14 h 18	13.6	5.6	2.4	0.0	52.4
36	22-09-2018 14:19:15	14 h 19	13.4	5.6	2.4	0.0	53.7
37	22-09-2018 14:20:15	14 h 20	13.5	5.7	2.4	0.0	53.7
38	22-09-2018 14:21:15	14 h 21	13.5	5.7	2.4	0.0	54.3
39	22-09-2018 14:22:15	14 h 22	13.4	5.7	2.5	0.0	55.0
40	22-09-2018 14:23:15	14 h 23	13.5	5.7	2.4	0.0	54.6
41	22-09-2018 14:24:15	14 h 24	13.5	5.7	2.4	0.0	54.9
42	22-09-2018 14:25:15	14 h 25	13.5	5.7	2.5	0.0	54.6
43	22-09-2018 14:26:15	14 h 26	13.5	5.6	2.4	0.0	54.2
44	22-09-2018 14:27:15	14 h 27	13.5	5.7	2.3	0.0	54.5
45	22-09-2018 14:28:15	14 h 28	13.5	5.7	2.3	0.0	55.1
46	22-09-2018 14:29:15	14 h 29	13.5	5.7	2.4	0.0	55.0
47	22-09-2018 14:30:15	14 h 30	13.5	5.7	2.3	0.0	56.0
48	22-09-2018 14:31:15	14 h 31	13.4	5.7	2.3	0.0	56.3
49	22-09-2018 14:32:15	14 h 32	13.5	5.7	2.2	0.0	55.7
50	22-09-2018 14:33:15	14 h 33	13.4	5.7	2.3	0.0	56.3
51	22-09-2018 14:34:15	14 h 34	13.4	5.8	2.2	0.0	57.5
52	22-09-2018 14:35:15	14 h 35	13.5	5.7	2.3	0.0	56.6
53	22-09-2018 14:36:15	14 h 36	13.4	5.7	2.6	0.0	57.5
54	22-09-2018 14:37:15	14 h 37	13.4	5.7	2.3	0.0	58.7
55	22-09-2018 14:38:15	14 h 38	13.5	5.7	2.3	0.0	58.0
56	22-09-2018 14:39:15	14 h 39	13.4	5.7	2.3	0.0	58.0
57	22-09-2018 14:40:15	14 h 40	13.5	5.7	2.6	0.0	57.7
58	22-09-2018 14:41:15	14 h 41	13.5	5.7	2.3	0.0	57.5
59	22-09-2018 14:42:15	14 h 42	13.5	5.7	2.4	0.0	56.9
60	22-09-2018 14:43:15	14 h 43	13.5	5.7	2.1	0.0	58.1
61	22-09-2018 14:44:15	14 h 44	13.4	5.7	2.2	0.0	58.5
62	22-09-2018 14:45:15	14 h 45	13.5	5.7	2.3	0.0	58.7
63	22-09-2018 14:46:15	14 h 46	13.5	5.7	2.1	0.0	58.4
64	22-09-2018 14:47:15	14 h 47	13.5	5.7	2.3	0.0	58.6
65	22-09-2018 14:48:15	14 h 48	13.5	5.7	2.3	0.0	59.4
66	22-09-2018 14:49:15	14 h 49	13.5	5.7	2.1	0.0	59.1
67	22-09-2018 14:50:15	14 h 50	13.5	5.7	2.2	0.0	58.8
68	22-09-2018 14:51:15	14 h 51	13.6	5.7	2.2	0.0	58.1
69	22-09-2018 14:52:15	14 h 52	13.6	5.6	2.3	0.0	58.3
70	22-09-2018 14:53:15	14 h 53	13.4	5.7	2.3	0.0	59.0
71	22-09-2018 14:54:15	14 h 54	13.6	5.6	2.3	0.0	58.2
72	22-09-2018 14:55:15	14 h 55	13.6	5.7	2.2	0.0	58.5
73	22-09-2018 14:56:15	14 h 56	13.5	5.7	2.1	0.0	59.4

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
74	22-09-2018 14:57:15	14 h 57	13.5	5.7	2.1	0.0	59.2
75	22-09-2018 14:58:15	14 h 58	14.0	5.5	2.7	0.0	53.1
76	22-09-2018 14:59:15	14 h 59	14.0	5.4	2.5	0.0	49.9
77	22-09-2018 15:00:15	15 h 00	13.6	5.5	2.3	0.0	53.4
78	22-09-2018 15:01:15	15 h 01	13.5	5.6	2.0	0.0	58.0
79	22-09-2018 15:02:15	15 h 02	13.9	5.5	2.3	0.0	55.8
80	22-09-2018 15:03:15	15 h 03	13.9	5.4	2.3	0.0	56.0
81	22-09-2018 15:04:15	15 h 04	13.9	5.4	2.3	0.0	56.4
82	22-09-2018 15:05:15	15 h 05	13.9	5.4	2.3	0.0	56.2
83	22-09-2018 15:06:15	15 h 06	13.9	5.4	2.4	0.0	55.3
84	22-09-2018 15:07:15	15 h 07	14.0	5.4	2.5	0.0	54.9
85	22-09-2018 15:08:15	15 h 08	14.0	5.3	2.5	0.0	53.8
86	22-09-2018 15:09:15	15 h 09	14.0	5.3	2.4	0.0	53.6
87	22-09-2018 15:10:15	15 h 10	14.0	5.3	2.3	0.0	54.1
88	22-09-2018 15:11:15	15 h 11	13.9	5.3	2.1	0.0	54.7
89	22-09-2018 15:12:15	15 h 12	14.0	5.4	2.4	0.0	54.5
90	22-09-2018 15:13:15	15 h 13	14.0	5.3	2.4	0.0	54.2
91	22-09-2018 15:14:15	15 h 14	14.0	5.3	2.1	0.0	54.4
92	22-09-2018 15:15:15	15 h 15	13.9	5.3	2.3	0.0	54.9
93	22-09-2018 15:16:15	15 h 16	13.9	5.4	2.3	0.0	55.8
94	22-09-2018 15:17:15	15 h 17	13.9	5.4	2.3	0.0	55.6
95	22-09-2018 15:18:15	15 h 18	14.0	5.4	2.3	0.0	54.8
96	22-09-2018 15:19:15	15 h 19	14.0	5.4	2.0	0.0	54.7
97	22-09-2018 15:20:15	15 h 20	14.0	5.3	2.3	0.0	54.2
98	22-09-2018 15:21:15	15 h 21	13.9	5.4	2.3	0.0	55.3
99	22-09-2018 15:22:15	15 h 22	14.0	5.4	2.4	0.0	54.6
100	22-09-2018 15:23:15	15 h 23	14.0	5.3	2.0	0.0	54.3
101	22-09-2018 15:24:15	15 h 24	14.0	5.3	2.2	0.0	54.3
102	22-09-2018 15:25:15	15 h 25	14.0	5.3	2.4	0.0	54.5
103	22-09-2018 15:26:15	15 h 26	14.0	5.3	1.9	0.0	54.5
104	22-09-2018 15:27:15	15 h 27	13.9	5.3	2.0	0.0	55.3
105	22-09-2018 15:28:15	15 h 28	14.0	5.3	2.3	0.0	55.4
106	22-09-2018 15:29:15	15 h 29	14.0	5.3	2.3	0.0	54.6
107	22-09-2018 15:30:15	15 h 30	14.0	5.3	2.2	0.0	55.5
108	22-09-2018 15:31:15	15 h 31	14.0	5.3	2.3	0.0	55.0
109	22-09-2018 15:32:15	15 h 32	14.0	5.3	2.2	0.0	55.3
110	22-09-2018 15:33:15	15 h 33	14.0	5.3	2.3	0.0	55.5
111	22-09-2018 15:34:15	15 h 34	13.9	5.3	2.2	0.0	55.8
112	22-09-2018 15:35:15	15 h 35	13.9	5.4	2.1	0.0	56.1
113	22-09-2018 15:36:15	15 h 36	13.9	5.4	2.2	0.0	56.6
114	22-09-2018 15:37:15	15 h 37	13.9	5.4	2.1	0.0	56.9
115	22-09-2018 15:38:15	15 h 38	14.1	5.3	2.3	0.0	54.4
116	22-09-2018 15:39:15	15 h 39	14.2	5.2	2.3	0.0	53.5
117	22-09-2018 15:40:15	15 h 40	14.2	5.2	2.4	0.0	53.4
118	22-09-2018 15:41:15	15 h 41	14.2	5.2	2.2	0.0	53.9
119	22-09-2018 15:42:15	15 h 42	14.1	5.2	2.3	0.0	54.2
120	22-09-2018 15:43:15	15 h 43	14.1	5.2	2.3	0.0	54.4
121	22-09-2018 15:44:15	15 h 44	13.9	5.3	2.6	0.0	54.4
122	22-09-2018 15:45:15	15 h 45	13.9	5.4	2.3	0.0	53.5
123	22-09-2018 15:46:15	15 h 46	14.2	5.4	2.1	0.0	49.5
124	22-09-2018 15:47:15	15 h 47	14.5	5.1	2.4	0.0	39.5
125	22-09-2018 15:48:15	15 h 48	14.6	5.0	2.9	0.0	36.6
126	22-09-2018 15:49:15	15 h 49	14.5	5.0	3.0	0.0	36.2
127	22-09-2018 15:50:15	15 h 50	14.6	5.0	3.4	0.0	35.2
128	22-09-2018 15:51:15	15 h 51					
129	22-09-2018 15:52:15	15 h 52	14.5	5.0	3.5	0.0	38.6
130	22-09-2018 15:53:15	15 h 53	14.3	5.1	3.8	0.0	39.7
131	22-09-2018 15:54:15	15 h 54	14.3	5.2	3.7	0.0	39.8
132	22-09-2018 15:55:15	15 h 55	14.3	5.1	3.7	0.0	39.8
133	22-09-2018 15:56:15	15 h 56	14.3	5.1	3.7	0.0	39.8
134	22-09-2018 15:57:15	15 h 57	14.3	5.2	3.9	0.0	39.3
135	22-09-2018 15:58:15	15 h 58	14.3	5.1	3.7	0.0	39.9
136	22-09-2018 15:59:15	15 h 59	14.3	5.2	3.7	0.0	39.5
137	22-09-2018 16:00:15	16 h 00	14.3	5.1	3.7	0.0	38.9
138	22-09-2018 16:01:15	16 h 01	14.3	5.1	3.4	0.0	39.8
139	22-09-2018 16:02:15	16 h 02	14.4	5.1	3.4	0.0	38.9
140	22-09-2018 16:03:15	16 h 03	14.3	5.2	3.3	0.0	40.1

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
141	22-09-2018 16:04:15	16 h 04	14.4	5.1	3.2	0.0	39.2
142	22-09-2018 16:05:15	16 h 05	14.4	5.1	2.9	0.0	39.8
143	22-09-2018 16:06:15	16 h 06	13.5	5.6	3.2	0.0	40.6
144	22-09-2018 16:07:15	16 h 07	13.0	6.0	2.9	0.0	43.4
145	22-09-2018 16:08:15	16 h 08	14.7	5.1	2.3	0.0	40.5
146	22-09-2018 16:09:15	16 h 09	14.1	5.2	3.4	0.0	39.0
147	22-09-2018 16:10:15	16 h 10	14.5	5.1	2.5	0.0	40.3
148	22-09-2018 16:11:15	16 h 11	14.4	5.1	2.6	0.0	40.0
149	22-09-2018 16:12:15	16 h 12	14.3	5.1	2.9	0.0	40.0
150	22-09-2018 16:13:15	16 h 13	14.3	5.1	2.9	0.0	40.1
151	22-09-2018 16:14:15	16 h 14	14.4	5.1	3.2	0.0	39.2
152	22-09-2018 16:15:15	16 h 15	14.3	5.2	3.0	0.0	40.8
153	22-09-2018 16:16:15	16 h 16	14.3	5.2	3.0	0.0	40.1
154	22-09-2018 16:17:15	16 h 17					
155	22-09-2018 16:18:15	16 h 18	14.5	4.9	3.3	0.0	34.2
156	22-09-2018 16:19:15	16 h 19	14.6	4.9	3.2	0.0	33.4
157	22-09-2018 16:20:15	16 h 20	14.7	4.9	3.2	0.0	33.5
158	22-09-2018 16:21:15	16 h 21	14.5	5.0	2.9	0.0	33.9
159	22-09-2018 16:22:15	16 h 22	14.6	4.9	2.9	0.0	33.9
160	22-09-2018 16:23:15	16 h 23	14.6	5.0	2.9	0.0	33.8
161	22-09-2018 16:24:15	16 h 24	14.6	5.0	2.9	0.0	34.4
162	22-09-2018 16:25:15	16 h 25	14.7	4.9	3.2	0.0	33.1
163	22-09-2018 16:26:15	16 h 26	14.9	4.8	3.3	0.0	31.6
164	22-09-2018 16:27:15	16 h 27	15.0	4.7	3.2	0.0	31.5
165	22-09-2018 16:28:15	16 h 28	15.0	4.7	3.4	0.0	31.3
166	22-09-2018 16:29:15	16 h 29	15.2	4.6	3.5	0.0	29.2
167	22-09-2018 16:30:15	16 h 30	15.2	4.5	3.2	0.0	29.6
168	22-09-2018 16:31:15	16 h 31	15.0	4.6	3.0	0.0	31.9
169	22-09-2018 16:32:15	16 h 32	14.9	4.7	2.5	0.0	32.2
170	22-09-2018 16:33:15	16 h 33	14.9	4.7	2.6	0.0	32.3
171	22-09-2018 16:34:15	16 h 34	14.8	4.7	2.6	0.0	32.4
172	22-09-2018 16:35:15	16 h 35	14.9	4.7	2.9	0.0	32.1
173	22-09-2018 16:36:15	16 h 36	14.8	4.7	2.9	0.0	32.9
174	22-09-2018 16:37:15	16 h 37	14.9	4.8	2.6	0.0	32.4
175	22-09-2018 16:38:15	16 h 38	14.8	4.8	2.8	0.0	32.9
176	22-09-2018 16:39:15	16 h 39	14.9	4.8	2.5	0.0	32.6
177	22-09-2018 16:40:15	16 h 40	14.9	4.8	2.8	0.0	32.1
178	22-09-2018 16:41:15	16 h 41	14.9	4.8	2.9	0.0	31.9
179	22-09-2018 16:42:15	16 h 42	14.8	4.8	2.8	0.0	32.4
180	22-09-2018 16:43:15	16 h 43	14.9	4.8	2.6	0.0	31.8
181	22-09-2018 16:44:15	16 h 44	14.8	4.8	2.5	0.0	32.4
182	22-09-2018 16:45:15	16 h 45	14.8	4.8	2.5	0.0	32.4
183	22-09-2018 16:46:15	16 h 46	14.8	4.8	2.7	0.0	32.6
184	22-09-2018 16:47:15	16 h 47	14.9	4.8	2.8	0.0	31.9
185	22-09-2018 16:48:15	16 h 48	14.8	4.7	2.9	0.0	31.9
186	22-09-2018 16:49:15	16 h 49	15.0	4.7	3.0	0.0	30.1
187	22-09-2018 16:50:15	16 h 50	15.2	4.6	2.8	0.0	28.6
188	22-09-2018 16:51:15	16 h 51	15.3	4.5	2.7	0.0	28.3
189	22-09-2018 16:52:15	16 h 52	15.4	4.4	2.6	0.0	27.9
190	22-09-2018 16:53:15	16 h 53	15.3	4.4	2.1	0.0	28.1
191	22-09-2018 16:54:15	16 h 54	15.3	4.4	2.3	0.0	27.9
192	22-09-2018 16:55:15	16 h 55	15.1	4.4	2.5	0.0	28.7
193	22-09-2018 16:56:15	16 h 56	15.1	4.5	2.7	0.0	29.2
194	22-09-2018 16:57:15	16 h 57	14.9	4.6	2.6	0.0	29.8
195	22-09-2018 16:58:15	16 h 58	15.0	4.6	2.7	0.0	29.5
196	22-09-2018 16:59:15	16 h 59	15.0	4.6	2.7	0.0	29.6
197	22-09-2018 17:00:15	17 h 00	15.0	4.6	2.7	0.0	29.6
198	22-09-2018 17:01:15	17 h 01	15.1	4.6	2.7	0.0	29.2
199	22-09-2018 17:02:15	17 h 02	15.0	4.6	2.7	0.0	29.5
200	22-09-2018 17:03:15	17 h 03	15.0	4.6	3.0	0.0	29.8
201	22-09-2018 17:04:15	17 h 04	14.6	4.8	2.6	0.0	31.7
202	22-09-2018 17:05:15	17 h 05	14.5	4.9	2.5	0.0	32.2
203	22-09-2018 17:06:15	17 h 06	14.5	4.9	2.4	0.0	32.8
204	22-09-2018 17:07:15	17 h 07	14.5	5.0	2.3	0.0	33.0
205	22-09-2018 17:08:15	17 h 08	14.5	5.0	2.5	0.0	32.5
206	22-09-2018 17:09:15	17 h 09	14.5	5.0	2.7	0.0	32.6
207	22-09-2018 17:10:15	17 h 10	14.4	5.0	2.5	0.0	33.0

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
208	22-09-2018 17:11:15	17 h 11	14.5	5.0	2.4	0.0	32.9
209	22-09-2018 17:12:15	17 h 12	14.5	5.0	2.7	0.0	32.8
210	22-09-2018 17:13:15	17 h 13	14.4	5.0	2.4	0.0	33.1
211	22-09-2018 17:14:15	17 h 14	14.5	5.0	2.6	0.0	32.8
212	22-09-2018 17:15:15	17 h 15	14.4	5.1	2.6	0.0	33.0
213	22-09-2018 17:16:15	17 h 16	14.4	5.1	2.7	0.0	32.7
214	22-09-2018 17:17:15	17 h 17	14.4	5.1	2.7	0.0	33.1
215	22-09-2018 17:18:15	17 h 18	14.4	5.1	2.5	0.0	33.2
216	22-09-2018 17:19:15	17 h 19	14.6	5.1	2.7	0.0	32.1
217	22-09-2018 17:20:15	17 h 20	14.5	5.0	2.7	0.0	32.4
218	22-09-2018 17:21:15	17 h 21	14.5	5.0	2.4	0.0	32.9
219	22-09-2018 17:22:15	17 h 22	14.4	5.0	2.7	0.0	33.3
220	22-09-2018 17:23:15	17 h 23	14.4	5.0	2.7	0.0	33.2
221	22-09-2018 17:24:15	17 h 24	14.5	5.0	2.8	0.0	32.6
222	22-09-2018 17:25:15	17 h 25	14.5	5.0	2.6	0.0	32.9
223	22-09-2018 17:26:15	17 h 26	14.5	5.0	2.9	0.0	32.6
224	22-09-2018 17:27:15	17 h 27	14.5	5.0	2.7	0.0	32.6
225	22-09-2018 17:28:15	17 h 28	14.4	5.0	2.8	0.0	32.7
226	22-09-2018 17:29:15	17 h 29	14.5	5.0	2.9	0.0	32.9
227	22-09-2018 17:30:15	17 h 30	14.5	5.0	2.7	0.0	32.7
228	22-09-2018 17:31:15	17 h 31	14.5	5.0	2.7	0.0	32.9
229	22-09-2018 17:32:15	17 h 32	14.4	5.0	2.7	0.0	32.9
230	22-09-2018 17:33:15	17 h 33	14.4	5.1	2.7	0.0	33.0
231	22-09-2018 17:34:15	17 h 34	14.6	5.0	2.8	0.0	32.0
232	22-09-2018 17:35:15	17 h 35	14.5	5.0	2.8	0.0	32.6
233	22-09-2018 17:36:15	17 h 36	14.5	5.0	3.0	0.0	32.8
234	22-09-2018 17:37:15	17 h 37	14.4	5.0	2.7	0.0	32.9
235	22-09-2018 17:38:15	17 h 38	14.4	5.0	2.8	0.0	33.1
236	22-09-2018 17:39:15	17 h 39	14.4	5.1	2.8	0.0	33.1
237	22-09-2018 17:40:15	17 h 40	14.4	5.1	2.8	0.0	33.4
238	28-09-2018 11:35:51	11 h 35	14.6	4.8	3.1	0.0	49.2
239	28-09-2018 11:36:51	11 h 36	14.5	4.9	2.9	0.0	49.8
240	28-09-2018 11:37:51	11 h 37	14.6	4.8	3.1	0.0	49.5
241	28-09-2018 11:38:51	11 h 38	14.4	4.9	3.2	0.0	51.6
242	28-09-2018 11:39:51	11 h 39	14.4	4.9	3.3	0.0	52.1
243	28-09-2018 11:40:51	11 h 40	14.4	4.9	3.0	0.0	52.7
244	28-09-2018 11:41:51	11 h 41	14.5	4.9	3.0	0.0	52.3
245	28-09-2018 11:42:51	11 h 42	14.5	4.9	3.2	0.0	52.7
246	28-09-2018 11:43:51	11 h 43	14.5	4.9	3.2	0.0	52.8
247	28-09-2018 11:44:51	11 h 44	14.5	4.9	3.3	0.0	52.8
248	28-09-2018 11:45:51	11 h 45	14.4	4.9	3.1	0.0	53.5
249	28-09-2018 11:46:51	11 h 46	14.5	4.8	3.2	0.0	52.8
250	28-09-2018 11:47:51	11 h 47	14.5	4.8	3.3	0.0	53.4
251	28-09-2018 11:48:51	11 h 48	14.5	4.8	3.3	0.0	53.3
252	28-09-2018 11:49:51	11 h 49	14.5	4.8	3.2	0.0	53.8
253	28-09-2018 11:50:51	11 h 50	14.6	4.8	3.0	0.0	54.3
254	28-09-2018 11:51:51	11 h 51	14.5	4.8	2.9	0.0	54.4
255	28-09-2018 11:52:51	11 h 52	14.5	4.8	3.0	0.0	54.8
256	28-09-2018 11:53:51	11 h 53	14.5	4.8	3.2	0.0	55.3
257	28-09-2018 11:54:51	11 h 54	14.5	4.8	3.2	0.0	55.1
258	28-09-2018 11:55:51	11 h 55	14.6	4.7	3.3	0.0	54.0
259	28-09-2018 11:56:51	11 h 56	14.6	4.8	3.2	0.0	55.6
260	28-09-2018 11:57:51	11 h 57	14.5	4.8	3.2	0.0	55.6
261	28-09-2018 11:58:51	11 h 58	14.6	4.7	3.4	0.0	54.9
262	28-09-2018 11:59:51	11 h 59	14.6	4.8	2.9	0.0	55.7
263	28-09-2018 12:00:51	12 h 00	14.1	5.0	3.2	0.0	58.1
264	28-09-2018 12:01:51	12 h 01	14.7	4.7	3.2	0.0	54.9
265	28-09-2018 12:02:51	12 h 02	14.5	4.8	3.0	0.0	57.0
266	28-09-2018 12:03:51	12 h 03	14.4	4.9	2.9	0.0	57.1
267	28-09-2018 12:04:51	12 h 04	14.5	4.9	3.1	0.0	57.0
268	28-09-2018 12:05:51	12 h 05	14.4	4.9	3.0	0.0	57.8
269	28-09-2018 12:06:51	12 h 06	14.5	4.9	3.1	0.0	57.1
270	28-09-2018 12:07:51	12 h 07	14.5	4.9	3.0	0.0	56.8
271	28-09-2018 12:08:51	12 h 08	14.5	4.9	3.0	0.0	57.0
272	28-09-2018 12:09:51	12 h 09	14.5	4.8	2.9	0.0	57.3
273	28-09-2018 12:10:51	12 h 10	14.5	4.9	3.1	0.0	57.3
274	28-09-2018 12:11:51	12 h 11	14.5	4.9	3.2	0.0	57.1

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
275	28-09-2018 12:12:51	12 h 12	14.6	4.8	3.2	0.0	55.9
276	28-09-2018 12:13:51	12 h 13	14.5	4.8	3.2	0.0	56.7
277	28-09-2018 12:14:51	12 h 14	14.4	4.9	3.0	0.0	57.5
278	28-09-2018 12:15:51	12 h 15	14.5	4.9	3.1	0.0	57.0
279	28-09-2018 12:16:51	12 h 16	14.5	4.9	3.0	0.0	57.1
280	28-09-2018 12:17:51	12 h 17	14.5	4.8	2.9	0.0	56.8
281	28-09-2018 12:18:51	12 h 18	14.5	4.9	3.0	0.0	57.7
282	28-09-2018 12:19:51	12 h 19	14.6	4.8	2.8	0.0	56.5
283	28-09-2018 12:20:51	12 h 20	14.5	4.9	2.9	0.0	57.3
284	28-09-2018 12:21:51	12 h 21	14.5	4.9	3.0	0.0	57.3
285	28-09-2018 12:22:51	12 h 22	14.5	4.9	3.0	0.0	56.9
286	28-09-2018 12:23:51	12 h 23	14.5	4.9	3.0	0.0	56.9
287	28-09-2018 12:24:51	12 h 24	14.5	4.9	2.9	0.0	56.6
288	28-09-2018 12:25:51	12 h 25	14.5	4.9	3.0	0.0	56.8
289	28-09-2018 12:26:51	12 h 26	14.5	4.9	2.9	0.0	56.8
290	28-09-2018 12:27:51	12 h 27	14.5	4.9	2.9	0.0	57.7
291	28-09-2018 12:28:51	12 h 28	15.1	4.5	3.8	0.0	49.5
292	28-09-2018 12:29:51	12 h 29	15.3	4.4	3.8	0.0	48.8
293	28-09-2018 12:30:51	12 h 30	15.2	4.4	3.8	0.0	49.2
294	28-09-2018 12:31:51	12 h 31	15.2	4.4	3.7	0.0	49.5
295	28-09-2018 12:32:51	12 h 32	15.2	4.4	3.6	0.0	48.9
296	28-09-2018 12:33:51	12 h 33	15.1	4.4	3.7	0.0	49.5
297	28-09-2018 12:34:51	12 h 34	15.2	4.4	3.6	0.0	48.8
298	28-09-2018 12:35:51	12 h 35	15.1	4.4	3.5	0.0	49.0
299	28-09-2018 12:36:51	12 h 36	15.2	4.4	3.8	0.0	48.7
300	28-09-2018 12:37:51	12 h 37	15.2	4.4	3.7	0.0	48.7
301	28-09-2018 12:38:51	12 h 38	15.2	4.4	3.8	0.0	48.9
302	28-09-2018 12:39:51	12 h 39	15.3	4.4	3.8	0.0	48.7
303	28-09-2018 12:40:51	12 h 40	15.1	4.4	3.7	0.0	49.3
304	28-09-2018 12:41:51	12 h 41	15.2	4.3	3.6	0.0	49.1
305	28-09-2018 12:42:51	12 h 42	15.2	4.4	3.6	0.0	49.2
306	28-09-2018 12:43:51	12 h 43	15.2	4.4	3.7	0.0	49.1
307	28-09-2018 12:44:51	12 h 44	15.2	4.3	3.5	0.0	49.1
308	28-09-2018 12:45:51	12 h 45	15.3	4.3	3.7	0.0	48.7
309	28-09-2018 12:46:51	12 h 46	15.3	4.3	3.7	0.0	48.5
310	28-09-2018 12:47:51	12 h 47	15.2	4.3	3.6	0.0	49.1
311	28-09-2018 12:48:51	12 h 48	15.2	4.3	3.7	0.0	49.0
312	28-09-2018 12:49:51	12 h 49	15.3	4.3	3.7	0.0	48.7
313	28-09-2018 12:50:51	12 h 50	15.2	4.3	3.4	0.0	49.0
314	28-09-2018 12:51:51	12 h 51	15.3	4.3	3.7	0.0	48.2
315	28-09-2018 12:52:51	12 h 52	15.3	4.3	3.7	0.0	47.3
316	28-09-2018 12:53:51	12 h 53	15.3	4.3	3.5	0.0	47.9
317	28-09-2018 12:54:51	12 h 54	15.3	4.3	3.6	0.0	47.6
318	28-09-2018 12:55:51	12 h 55	15.2	4.3	3.6	0.0	47.9
319	28-09-2018 12:56:51	12 h 56	15.3	4.3	3.6	0.0	47.3
320	28-09-2018 12:57:51	12 h 57	15.3	4.3	3.5	0.0	47.8
321	28-09-2018 12:58:51	12 h 58	15.3	4.3	3.4	0.0	47.1
322	28-09-2018 12:59:51	12 h 59	15.3	4.3	3.4	0.0	47.4
323	28-09-2018 13:00:51	13 h 00	15.3	4.3	3.4	0.0	48.0
324	28-09-2018 13:01:51	13 h 01	15.3	4.3	3.4	0.0	47.7
325	28-09-2018 13:02:51	13 h 02	15.2	4.3	3.2	0.0	48.1
326	28-09-2018 13:03:51	13 h 03	15.3	4.3	3.5	0.0	47.4
327	28-09-2018 13:04:51	13 h 04	15.3	4.3	3.3	0.0	47.7
328	28-09-2018 13:05:51	13 h 05	15.3	4.3	3.4	0.0	47.3
329	28-09-2018 13:06:51	13 h 06	15.3	4.3	3.6	0.0	47.3
330	28-09-2018 13:07:51	13 h 07	15.3	4.3	3.4	0.0	47.9
331	28-09-2018 13:08:51	13 h 08	15.3	4.3	3.5	0.0	47.4
332	28-09-2018 13:09:51	13 h 09	15.8	4.0	4.4	0.0	42.8
333	28-09-2018 13:10:51	13 h 10	15.5	4.1	3.8	0.0	45.6
334	28-09-2018 13:11:51	13 h 11	15.4	4.2	3.1	0.0	47.3
335	28-09-2018 13:12:51	13 h 12	15.3	4.3	3.3	0.0	47.9
336	28-09-2018 13:13:51	13 h 13	15.2	4.3	3.4	0.0	47.5
337	28-09-2018 13:14:51	13 h 14	15.2	4.3	3.4	0.0	47.8
338	28-09-2018 13:15:51	13 h 15	15.3	4.3	3.1	0.0	47.5
339	28-09-2018 13:16:51	13 h 16	15.2	4.4	3.4	0.0	47.7
340	28-09-2018 13:17:51	13 h 17	15.2	4.4	3.1	0.0	47.8
341	28-09-2018 13:18:51	13 h 18	15.2	4.4	3.0	0.0	48.0

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
342	28-09-2018 13:19:51	13 h 19	15.2	4.4	3.1	0.0	48.3
343	28-09-2018 13:20:51	13 h 20	15.3	4.4	3.3	0.0	47.4
344	28-09-2018 13:21:51	13 h 21	15.3	4.3	3.1	0.0	47.7
345	28-09-2018 13:22:51	13 h 22	15.3	4.3	3.4	0.0	46.9
346	28-09-2018 13:23:51	13 h 23	15.7	4.1	3.8	0.0	43.3
347	28-09-2018 13:24:51	13 h 24	15.3	4.3	3.2	0.0	47.2
348	28-09-2018 13:25:51	13 h 25	15.3	4.3	3.2	0.0	47.2
349	28-09-2018 13:26:51	13 h 26	15.3	4.3	3.4	0.0	47.8
350	28-09-2018 13:27:51	13 h 27	15.2	4.3	3.1	0.0	48.1
351	28-09-2018 13:28:51	13 h 28	15.3	4.3	3.3	0.0	48.1
352	28-09-2018 13:29:51	13 h 29	15.3	4.3	3.1	0.0	47.8
353	28-09-2018 13:30:51	13 h 30	15.4	4.3	3.3	0.0	46.8
354	28-09-2018 13:31:51	13 h 31	15.3	4.3	3.4	0.0	48.0
355	28-09-2018 13:32:51	13 h 32	15.5	4.2	3.5	0.0	45.8
356	28-09-2018 13:33:51	13 h 33	15.7	4.0	3.6	0.0	43.6
357	28-09-2018 13:34:51	13 h 34	15.7	4.0	3.4	0.0	43.2
358	28-09-2018 13:35:51	13 h 35	15.7	4.0	3.7	0.0	43.3
359	28-09-2018 13:36:51	13 h 36	15.7	4.0	3.7	0.0	43.5
360	28-09-2018 13:37:51	13 h 37	15.7	4.0	3.7	0.0	43.2
361	28-09-2018 13:38:51	13 h 38	15.7	4.0	3.5	0.0	43.2
362	28-09-2018 13:39:51	13 h 39	15.7	4.0	3.6	0.0	43.4
363	28-09-2018 13:40:51	13 h 40	15.7	4.0	3.7	0.0	43.7
364	28-09-2018 13:41:51	13 h 41	15.7	4.0	3.7	0.0	43.1
365	28-09-2018 13:42:51	13 h 42	15.7	4.0	3.6	0.0	42.8
366	28-09-2018 13:43:51	13 h 43	15.7	4.0	3.6	0.0	43.2
367	28-09-2018 13:44:51	13 h 44	15.7	4.0	3.6	0.0	43.3
368	28-09-2018 13:45:51	13 h 45	15.7	4.0	3.6	0.0	42.9
369	28-09-2018 13:46:51	13 h 46	15.7	4.0	3.7	0.0	42.8
370	28-09-2018 13:47:51	13 h 47	15.7	4.0	3.6	0.0	42.8
371	28-09-2018 13:48:51	13 h 48	15.7	4.0	3.6	0.0	42.8
372	28-09-2018 13:49:51	13 h 49	15.7	4.0	3.7	0.0	42.6
373	28-09-2018 13:50:51	13 h 50	15.7	4.0	4.1	0.0	42.2
374	28-09-2018 13:51:51	13 h 51	15.7	4.0	4.1	0.0	42.2
375	28-09-2018 13:52:51	13 h 52	15.8	4.0	3.9	0.0	41.9
376	28-09-2018 13:53:51	13 h 53	15.8	4.0	4.0	0.0	41.8
377	28-09-2018 13:54:51	13 h 54	15.7	4.0	3.9	0.0	42.3
378	28-09-2018 13:55:51	13 h 55	15.7	4.0	3.9	0.0	43.2
379	28-09-2018 13:56:51	13 h 56	15.7	4.0	3.9	0.0	43.0
380	28-09-2018 13:57:51	13 h 57	15.7	4.0	3.9	0.0	42.4
381	28-09-2018 13:58:51	13 h 58	15.7	4.0	3.8	0.0	42.7
382	28-09-2018 13:59:51	13 h 59	15.7	4.0	3.6	0.0	42.7
383	28-09-2018 14:00:51	14 h 00					
384	28-09-2018 14:01:51	14 h 01					
385	28-09-2018 14:02:51	14 h 02					
386	28-09-2018 14:03:51	14 h 03					
387	28-09-2018 14:04:51	14 h 04					
388	28-09-2018 14:05:51	14 h 05					
389	28-09-2018 14:06:51	14 h 06					
390	28-09-2018 14:07:51	14 h 07					
391	28-09-2018 14:08:51	14 h 08					
392	28-09-2018 14:09:51	14 h 09					
393	28-09-2018 14:10:51	14 h 10					
394	28-09-2018 14:11:51	14 h 11					
395	28-09-2018 14:12:51	14 h 12					
396	28-09-2018 14:13:51	14 h 13					
397	28-09-2018 14:14:51	14 h 14	15.3	4.3	2.9	0.0	43.9
398	28-09-2018 14:15:51	14 h 15	15.2	4.4	2.6	0.0	45.1
399	28-09-2018 14:16:51	14 h 16	15.2	4.4	3.0	0.0	45.1
400	28-09-2018 14:17:51	14 h 17	15.2	4.4	3.3	0.0	45.5
401	28-09-2018 14:18:51	14 h 18	15.1	4.4	2.9	0.0	46.1
402	28-09-2018 14:19:51	14 h 19	15.1	4.4	2.8	0.0	45.9
403	28-09-2018 14:20:51	14 h 20	15.2	4.4	3.3	0.0	45.0
404	28-09-2018 14:21:51	14 h 21	15.5	4.3	3.7	0.0	43.6
405	28-09-2018 14:22:51	14 h 22	15.3	4.3	3.4	0.0	44.6
406	28-09-2018 14:23:51	14 h 23	15.2	4.4	3.2	0.0	45.5
407	28-09-2018 14:24:51	14 h 24	15.1	4.4	2.9	0.0	46.1
408	28-09-2018 14:25:51	14 h 25	15.2	4.4	3.0	0.0	45.1

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
409	29-09-2018 16:15:41	16 h 15	12.9	6.1	3.1	-2.7	70.9
410	29-09-2018 16:16:41	16 h 16	12.9	6.1	2.8	-2.9	71.0
411	29-09-2018 16:17:41	16 h 17	12.8	6.2	2.9	-2.8	71.1
412	29-09-2018 16:18:41	16 h 18	12.9	6.1	3.2	-2.8	70.3
413	29-09-2018 16:19:41	16 h 19	12.8	6.1	3.1	-2.8	70.9
414	29-09-2018 16:20:41	16 h 20	12.9	6.1	3.0	-2.8	69.6
415	29-09-2018 16:21:41	16 h 21	13.4	5.7	3.5	-2.6	66.3
416	29-09-2018 16:22:41	16 h 22	13.5	5.6	3.1	-2.4	66.4
417	29-09-2018 16:23:41	16 h 23	13.4	5.7	3.1	-2.4	69.6
418	29-09-2018 16:24:41	16 h 24	13.0	5.9	2.6	-2.5	75.1
419	29-09-2018 16:25:41	16 h 25	12.8	6.1	2.6	-2.3	75.4
420	29-09-2018 16:26:41	16 h 26	12.8	6.1	2.7	-2.1	73.8
421	29-09-2018 16:27:41	16 h 27	12.9	6.1	2.7	-2.1	73.2
422	29-09-2018 16:28:41	16 h 28	12.9	6.0	2.6	-2.1	71.6
423	29-09-2018 16:29:41	16 h 29	13.0	6.0	2.8	-1.8	70.2
424	29-09-2018 16:30:41	16 h 30	12.9	6.1	2.8	-1.8	71.3
425	29-09-2018 16:31:41	16 h 31	13.0	6.0	2.9	-1.5	70.1
426	29-09-2018 16:32:41	16 h 32	13.0	6.0	2.9	-1.6	69.8
427	29-09-2018 16:33:41	16 h 33	12.9	6.1	3.0	-1.4	70.8
428	29-09-2018 16:34:41	16 h 34	13.0	6.0	2.7	-1.3	69.3
429	29-09-2018 16:35:41	16 h 35	13.0	6.0	2.6	-1.3	69.9
430	29-09-2018 16:36:41	16 h 36	13.0	6.0	2.7	-1.3	69.6
431	29-09-2018 16:37:41	16 h 37	13.0	6.0	2.6	-1.1	70.3
432	29-09-2018 16:38:41	16 h 38	13.0	6.0	2.7	-1.1	69.4
433	29-09-2018 16:39:41	16 h 39	13.1	5.9	2.8	-1.1	68.7
434	29-09-2018 16:40:41	16 h 40	13.7	5.6	3.0	-1.0	62.4
435	29-09-2018 16:41:41	16 h 41	13.8	5.5	3.3	-1.0	61.1
436	29-09-2018 16:42:41	16 h 42	13.7	5.5	3.2	-1.0	62.0
437	29-09-2018 16:43:41	16 h 43	13.7	5.5	3.3	-1.1	62.0
438	29-09-2018 16:44:41	16 h 44	13.8	5.4	3.4	-0.9	61.3
439	29-09-2018 16:45:41	16 h 45	13.6	5.6	2.9	-0.8	63.1
440	29-09-2018 16:46:41	16 h 46	13.7	5.5	2.9	-0.6	63.0
441	29-09-2018 16:47:41	16 h 47	13.8	5.5	3.2	-0.7	62.3
442	29-09-2018 16:48:41	16 h 48	13.7	5.5	2.8	-0.6	62.7
443	29-09-2018 16:49:41	16 h 49	13.7	5.5	2.8	-0.5	62.5
444	29-09-2018 16:50:41	16 h 50	13.7	5.5	2.9	-0.3	62.9
445	29-09-2018 16:51:41	16 h 51	13.7	5.5	2.9	-0.2	63.4
446	29-09-2018 16:52:41	16 h 52	13.7	5.5	2.8	-0.2	63.6
447	29-09-2018 16:53:41	16 h 53	13.7	5.5	3.1	0.0	63.7
448	29-09-2018 16:54:41	16 h 54	13.7	5.5	3.1	0.2	63.5
449	29-09-2018 16:55:41	16 h 55	13.7	5.5	3.1	0.3	63.5
450	29-09-2018 16:56:41	16 h 56	13.7	5.5	3.0	0.5	63.7
451	29-09-2018 16:57:41	16 h 57	13.7	5.5	3.1	0.5	64.3
452	29-09-2018 16:58:41	16 h 58	13.7	5.5	2.9	0.7	63.7
453	29-09-2018 16:59:41	16 h 59	13.7	5.5	2.6	0.8	63.9
454	29-09-2018 17:00:41	17 h 00	13.7	5.5	3.1	0.8	64.2
455	29-09-2018 17:01:41	17 h 01	13.7	5.5	2.8	0.9	64.4
456	29-09-2018 17:02:41	17 h 02	13.7	5.5	2.8	1.1	64.4
457	29-09-2018 17:03:41	17 h 03	13.7	5.5	2.8	1.2	64.4
458	29-09-2018 17:04:41	17 h 04	13.7	5.5	2.8	1.3	64.0
459	29-09-2018 17:05:41	17 h 05	13.7	5.5	3.0	1.4	64.3
460	29-09-2018 17:06:41	17 h 06	13.7	5.5	2.8	1.6	64.5
461	29-09-2018 17:07:41	17 h 07	13.7	5.5	3.0	1.4	64.6
462	29-09-2018 17:08:41	17 h 08	13.7	5.5	3.0	1.5	64.5
463	29-09-2018 17:09:41	17 h 09	13.7	5.5	3.0	1.5	64.4
464	29-09-2018 17:10:41	17 h 10	13.7	5.5	3.0	1.4	63.8
465	29-09-2018 17:11:41	17 h 11	13.7	5.5	2.8	1.6	63.8
466	29-09-2018 17:12:41	17 h 12	13.9	5.4	3.2	1.7	60.9
467	29-09-2018 17:13:41	17 h 13	14.1	5.2	3.3	1.6	59.2
468	29-09-2018 17:14:41	17 h 14	14.2	5.2	3.3	1.6	58.3
469	29-09-2018 17:15:41	17 h 15	14.2	5.2	3.1	1.7	58.3
470	29-09-2018 17:16:41	17 h 16	14.2	5.2	3.4	1.9	57.6
471	29-09-2018 17:17:41	17 h 17	14.2	5.2	3.4	2.0	57.8
472	29-09-2018 17:18:41	17 h 18	14.2	5.1	3.3	2.1	57.6
473	29-09-2018 17:19:41	17 h 19	14.2	5.2	3.4	2.3	58.4
474	29-09-2018 17:20:41	17 h 20	14.2	5.2	3.3	2.2	58.3
475	29-09-2018 17:21:41	17 h 21	14.1	5.2	3.3	2.2	58.7

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
476	29-09-2018 17:22:41	17 h 22	14.1	5.2	3.4	2.6	58.3
477	29-09-2018 17:23:41	17 h 23	14.4	5.0	3.5	2.6	55.8
478	29-09-2018 17:24:41	17 h 24	14.6	4.9	3.5	2.8	57.3
479	29-09-2018 17:25:41	17 h 25	14.4	5.0	2.9	3.0	59.1
480	29-09-2018 17:26:41	17 h 26	14.3	5.1	2.8	3.1	58.9
481	29-09-2018 17:27:41	17 h 27	14.2	5.1	3.0	3.4	59.0
482	29-09-2018 17:28:41	17 h 28	14.2	5.1	2.8	3.6	58.1
483	29-09-2018 17:29:41	17 h 29	14.2	5.1	3.0	3.4	58.8
484	29-09-2018 17:30:41	17 h 30	14.2	5.2	2.9	3.4	59.0
485	29-09-2018 17:31:41	17 h 31	14.1	5.1	2.9	3.3	59.3
486	29-09-2018 17:32:41	17 h 32	14.1	5.2	2.8	3.3	60.0
487	29-09-2018 17:33:41	17 h 33	14.2	5.1	2.9	3.1	58.7
488	29-09-2018 17:34:41	17 h 34	14.1	5.1	2.9	2.8	58.7
489	29-09-2018 17:35:41	17 h 35	14.1	5.2	2.9	2.4	59.1
490	29-09-2018 17:36:41	17 h 36	14.1	5.2	2.9	2.1	59.0
491	29-09-2018 17:37:41	17 h 37	14.1	5.2	3.0	1.9	58.4
492	29-09-2018 17:38:41	17 h 38	14.1	5.2	3.0	1.7	58.5
493	29-09-2018 17:39:41	17 h 39	14.1	5.2	3.0	1.4	58.4
494	29-09-2018 17:40:41	17 h 40	14.1	5.2	3.0	1.1	58.3
495	29-09-2018 17:41:41	17 h 41	14.1	5.2	3.3	1.1	58.8
496	29-09-2018 17:42:41	17 h 42	14.1	5.2	3.1	0.7	58.7
497	29-09-2018 17:43:41	17 h 43	14.1	5.2	3.2	0.4	58.4
498	29-09-2018 17:44:41	17 h 44	14.1	5.2	2.9	0.3	58.7
499	29-09-2018 17:45:41	17 h 45	14.1	5.2	3.2	0.1	59.5
500	29-09-2018 17:46:41	17 h 46	14.1	5.2	2.9	-0.1	59.8
501	29-09-2018 17:47:41	17 h 47	14.1	5.2	2.9	-0.3	60.0
502	29-09-2018 17:48:41	17 h 48	14.1	5.2	2.8	-0.3	60.0
503	29-09-2018 17:49:41	17 h 49	14.1	5.2	3.1	-0.4	59.5
504	29-09-2018 17:50:41	17 h 50	14.1	5.2	3.2	-0.5	58.2
505	29-09-2018 17:51:41	17 h 51	14.1	5.2	2.9	-0.5	58.2
506	29-09-2018 17:52:41	17 h 52	14.1	5.2	3.1	-0.6	58.1
507	29-09-2018 17:53:41	17 h 53	14.1	5.2	3.2	-0.7	58.1
508	29-09-2018 17:54:41	17 h 54	14.1	5.2	2.9	-0.7	58.0
509	29-09-2018 17:55:41	17 h 55	14.1	5.2	2.8	-0.6	57.9
510	29-09-2018 17:56:41	17 h 56	14.0	5.3	3.0	-0.7	58.8
511	29-09-2018 17:57:41	17 h 57	14.0	5.3	3.0	-0.8	58.3
512	29-09-2018 17:58:41	17 h 58	14.0	5.2	2.8	-0.8	58.4
513	29-09-2018 17:59:41	17 h 59	14.1	5.2	3.0	-0.7	58.0
514	29-09-2018 18:00:41	18 h 00	14.1	5.2	2.7	-0.8	57.7
515	29-09-2018 18:01:41	18 h 01	14.0	5.3	3.1	-0.7	58.8
516	29-09-2018 18:02:41	18 h 02	14.1	5.2	2.8	-0.7	57.9
517	29-09-2018 18:03:41	18 h 03	14.1	5.2	2.9	-0.8	58.1
518	29-09-2018 18:04:41	18 h 04	14.1	5.2	3.0	-0.6	57.7
519	29-09-2018 18:05:41	18 h 05	14.0	5.3	3.0	-0.6	58.4
520	29-09-2018 18:06:41	18 h 06	14.1	5.2	2.9	-0.6	58.4
521	29-09-2018 18:07:41	18 h 07	14.1	5.3	2.6	-0.7	58.0
522	29-09-2018 18:08:41	18 h 08	14.0	5.3	2.6	-0.8	58.5
523	29-09-2018 18:09:41	18 h 09	14.1	5.2	3.0	-0.8	57.6
524	29-09-2018 18:10:41	18 h 10	14.1	5.2	2.9	-0.6	57.5
525	29-09-2018 18:11:41	18 h 11	14.1	5.2	3.0	-0.5	56.8
526	29-09-2018 18:12:41	18 h 12	13.0	5.9	1.8	-0.4	69.4
527	29-09-2018 18:13:41	18 h 13	12.8	6.2	1.7	-0.3	71.8
528	29-09-2018 18:14:41	18 h 14	12.8	6.2	1.5	-0.3	71.8
529	29-09-2018 18:15:41	18 h 15	12.9	6.1	1.7	-0.3	70.5
530	29-09-2018 18:16:41	18 h 16	12.9	6.2	1.7	-0.1	72.2
531	29-09-2018 18:17:41	18 h 17	12.9	6.1	1.7	0.2	71.7
532	29-09-2018 18:18:41	18 h 18	12.9	6.1	1.5	0.1	72.6
533	29-09-2018 18:19:41	18 h 19	12.9	6.1	1.6	0.2	72.6
534	29-09-2018 18:20:41	18 h 20	12.9	6.1	1.8	0.4	71.7
535	29-09-2018 18:21:41	18 h 21	13.0	6.1	1.9	0.5	70.3
536	29-09-2018 18:22:41	18 h 22	13.0	6.1	1.6	0.7	70.9
537	29-09-2018 18:23:41	18 h 23	13.0	6.1	1.7	0.7	71.0
538	29-09-2018 18:24:41	18 h 24	13.0	6.1	1.7	0.6	71.6
539	29-09-2018 18:25:41	18 h 25	13.0	6.1	1.7	0.7	70.9
540	29-09-2018 18:26:41	18 h 26	12.9	6.1	1.7	0.9	72.6
541	29-09-2018 18:27:41	18 h 27	13.0	6.1	1.7	0.7	71.8
542	29-09-2018 18:28:41	18 h 28	13.0	6.1	1.8	0.8	72.1

	A	B	C	E	G	L	N
6	Date/Heure	Type	O2 0-25 (%vs)	CO2 0-20 (%vs	CO 0-1000 (ppmvs)	SO2 (ppmvs)	NOX (ppmvs)
543	29-09-2018 18:29:41	18 h 29	13.0	6.1	1.6	0.8	72.6
544	29-09-2018 18:30:41	18 h 30	12.9	6.1	1.7	0.8	72.3
545	29-09-2018 18:31:41	18 h 31	13.0	6.1	1.8	0.7	72.3
546	29-09-2018 18:32:41	18 h 32	13.0	6.1	1.5	0.8	72.2
547	29-09-2018 18:33:41	18 h 33	12.9	6.1	1.4	0.9	72.4
548	29-09-2018 18:34:41	18 h 34	12.9	6.1	1.7	0.8	71.8
549	29-09-2018 18:35:41	18 h 35	12.9	6.1	1.6	0.8	71.8
550	29-09-2018 18:36:41	18 h 36	13.0	6.1	1.5	0.7	71.8
551	29-09-2018 18:37:41	18 h 37	12.9	6.1	1.7	0.7	72.3
552	29-09-2018 18:38:41	18 h 38	13.0	6.1	1.6	0.8	72.3
553	29-09-2018 18:39:41	18 h 39	13.0	6.1	1.6	0.5	71.9
554	29-09-2018 18:40:41	18 h 40	12.9	6.1	1.7	0.5	72.5
555	29-09-2018 18:41:41	18 h 41	13.0	6.1	1.7	0.5	72.1
556	29-09-2018 18:42:41	18 h 42	13.0	6.1	1.4	0.4	72.4
557	29-09-2018 18:43:41	18 h 43	12.7	6.2	1.3	0.3	75.2
558	29-09-2018 18:44:41	18 h 44	12.8	6.2	1.4	0.4	74.6
559	29-09-2018 18:45:41	18 h 45	12.7	6.3	1.4	0.3	75.7
560	29-09-2018 18:46:41	18 h 46	12.6	6.3	1.3	0.2	76.4
561	29-09-2018 18:47:41	18 h 47	13.3	5.9	1.4	0.1	76.8
562	29-09-2018 18:48:41	18 h 48	13.4	5.8	1.8	-0.1	76.9
563	29-09-2018 18:49:41	18 h 49	13.5	5.7	1.8	0.0	76.2
564	29-09-2018 18:50:41	18 h 50	13.5	5.7	1.9	-0.2	76.2
565	29-09-2018 18:51:41	18 h 51	13.6	5.6	1.9	-0.4	74.8
566	29-09-2018 18:52:41	18 h 52	13.7	5.6	1.9	-0.3	74.4
567	29-09-2018 18:53:41	18 h 53	13.7	5.6	2.0	-0.5	73.5
568	29-09-2018 18:54:41	18 h 54	13.7	5.6	2.1	-0.4	73.8
569	29-09-2018 18:55:41	18 h 55	13.7	5.6	2.0	-0.7	73.6
570	29-09-2018 18:56:41	18 h 56	13.7	5.6	2.0	-0.5	72.8
571	29-09-2018 18:57:41	18 h 57	13.7	5.6	2.1	-0.8	73.6
572	29-09-2018 18:58:41	18 h 58	13.7	5.6	1.9	-0.7	73.6
573	29-09-2018 18:59:41	18 h 59	13.7	5.6	1.9	-0.8	73.5
574	29-09-2018 19:00:41	19 h 00	13.7	5.6	1.9	-0.8	73.5
575	29-09-2018 19:01:41	19 h 01	13.7	5.6	2.0	-1.0	73.7
576	29-09-2018 19:02:41	19 h 02	13.6	5.6	1.8	-1.1	74.5
577	29-09-2018 19:03:41	19 h 03	13.6	5.7	2.1	-0.8	74.2
578	29-09-2018 19:04:41	19 h 04	13.5	5.7	1.9	-0.9	75.1
579	29-09-2018 19:05:41	19 h 05	13.6	5.6	1.9	-0.9	74.0

APPENDIX 3
CALIBRATION CERTIFICATES

FEUILLE D'ÉTALONNAGE DES MODULES 2018

MODULE	GAMMA (K_c)	ORIFICE (K_o) K_o	ΔH@ moy	DATE ÉTALONNAGE	COMPENSÉ 60 °F
1	1.009	0.999	0.970	13-mars-18	OUI
2	0.999	0.969	1.001	15-mars-18	OUI
3	0.990	0.950	1.188	05-déc-17	NON
4	1.001	0.946	1.040	15-août-18	NON
5	0.996	0.997	0.923	20-mars-18	NON
6	1.004	0.991	1.027	06-sept-18	OUI
7	0.981	0.994	0.928	27-oct-17	NON
8	1.013	1.037	0.958	06-juil-18	OUI
9	0.998	1.012	0.899	14-sept-17	NON
10	1.011	0.993	1.005	20-mars-18	OUI
11	0.989	0.974	1.054	06-sept-18	OUI
12	0.999	0.911	1.208	24-mai-18	NON
13	1.019	0.974	0.921	19-mars-18	NON
14	1.000	1.004	0.975	21-mars-18	OUI
15	1.000	0.982	1.021	13-nov-17	NON
16	1.017	1.027	0.872	15-sept-17	NON
17	0.987	1.050	0.833	15-sept-17	NON
18	1.002	1.013	0.896	07-sept-18	NON
19	0.997	1.000	1.005	06-sept-18	OUI
20	1.005	0.970	1.072	07-sept-18	OUI
21	0.989	1.011	0.984	13-nov-17	OUI
22	0.993	0.996	0.995	04-déc-17	NON
23	1.013	1.029	0.875	15-sept-17	NON
24	1.007	0.995	1.160	04-déc-17	NON
25	0.999	0.733	2.529	24-mai-18	NON

MODULE	GAMMA (K_C)	DATE ÉTALONNAGE
F-1	0.973	27-oct-17
F-2	0.977	05-juil-18
F-3	1.006	13-nov-17
F-4	1.009	17-juil-17
F-5	1.001	26-oct-17
F-6	1.013	22-mars-18

Version: 4
Date: 07-09-2018

GESTION GLOBALE AIR ET ENVIRONNEMENT

FEUILLE D'ÉTALONNAGE DES MODULES 2018

MODULE	GAMMA (K_c)	ORIFICE (K_o) K_o	∆H@ moy	DATE ÉTALONNAGE	COMPENSÉ 60 °F
1	1.009	0.999	0.970	13-mars-18	OUI
2	0.999	0.969	1.001	15-mars-18	OUI
3	0.990	0.950	1.188	05-déc-17	NON
4	1.001	0.946	1.040	15-août-18	NON
5	0.996	0.997	0.923	20-mars-18	NON
6	1.004	0.991	1.027	06-sept-18	OUI
7	0.981	0.994	0.928	27-oct-17	NON
8	1.013	1.037	0.958	06-juil-18	OUI
9	0.998	1.012	0.899	14-sept-17	NON
10	1.011	0.993	1.005	20-mars-18	OUI
11	0.989	0.974	1.054	06-sept-18	OUI
12	0.999	0.911	1.208	24-mai-18	NON
13	1.019	0.974	0.921	19-mars-18	NON
14	1.000	1.004	0.975	21-mars-18	OUI
15	1.000	0.982	1.021	13-nov-17	NON
16	1.017	1.027	0.872	15-sept-17	NON
17	0.987	1.050	0.833	15-sept-17	NON
18	1.002	1.013	0.896	07-sept-18	NON
19	0.997	1.000	1.005	06-sept-18	OUI
20	1.005	0.970	1.072	07-sept-18	OUI
21	0.989	1.011	0.984	13-nov-17	OUI
22	0.993	0.996	0.995	04-déc-17	NON
23	1.013	1.029	0.875	15-sept-17	NON
24	1.007	0.995	1.160	04-déc-17	NON
25	0.999	0.733	2.529	24-mai-18	NON

MODULE	GAMMA (K_C)	DATE ÉTALONNAGE
F-1	0.973	27-oct-17
F-2	0.977	05-juil-18
F-3	1.006	13-nov-17
F-4	1.009	17-juil-17
F-5	1.001	26-oct-17
F-6	1.013	22-mars-18

Version: 4
Date: 07-09-2018

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

RÉSUMÉ D'ÉTALONNAGE DES SONDES - S-03 V

Version 1 (02-03-2018)

#	Année	MDF	LV	#	1	2	3	4	5	6	7	8	9	10	11	12	Moy. V	Thermocouple (Validation)	P-T-B	Endroit
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				Buse	A-312-1												---			
03-05	2018	O	O	Ct	0.797												0.797	OK	OK	LE-02-W
				E. Rel	0.6												0.6			
				Buse	3Q-371	3Q-431	3Q-503	3Q-682									---			
03-06	2018	N	Q	Ct	0.778	0.779	0.781	0.773									0.778	OK	OK	Atelier
				E. Rel	0.6	0.4	0.6	0.7									0.6			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-07	2018	O	O	Ct	0.779	0.777	0.792	0.790	0.777	0.778	0.782	0.770	0.782	0.781	0.777	0.771	0.780	OK	OK	LE-02-W
				E. Rel	1.0	0.9	0.8	0.8	1.1	1.1	1.0	1.4	1.3	1.1	1.3	1.4	1.1			
				Buse	A-312-3												---			
03-09	2018	O	O	Ct	0.827												0.827	OK	OK	LE-14-B
				E. Rel	0.4												0.4			
				Buse	A-312-3												---			
03-10	2018	O	O	Ct	0.778												0.778	OK	OK	LE-11-V
				E. Rel	1.3												1.3			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-2	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-11	2018	O	O	Ct	0.792	0.795	0.794	0.793	0.796	0.796	0.795	0.798	0.796	0.793	0.793	0.789	0.794	OK	OK	LE-05-O
				E. Rel	1.1	0.8	1.0	1.1	1.1	1.0	1.0	0.6	1.0	1.2	0.9	1.1	1.0			
				Buse	A-312-3												---			
03-12	2018	O	O	Ct	0.791												0.791	OK	OK	LE-14-B
				E. Rel	1.1												1.1			
				Buse	A-312-3												---			
03-13	2018	O	O	Ct	0.772												0.772	OK	OK	LE-11-V
				E. Rel	0.9												0.9			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-14	2018	O	O	Ct	0.801	0.799	0.813	0.811	0.810	0.806	0.808	0.796	0.805	0.802	0.792	0.799	0.804	OK	OK	LE-02-W
				E. Rel	1.2	0.8	1.0	0.7	0.8	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-2	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-15	2018	O	O	Ct	0.808	0.805	0.816	0.811	0.808	0.804	0.800	0.798	0.802	0.800	0.792	0.784	0.802	OK	OK	LE-02-W
				E. Rel	1.2	1.2	1.2	1.0	1.2	1.2	1.3	1.2	1.1	1.3	1.3	1.0	1.2			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-16	2018	O	O	Ct	0.790	0.790	0.794	0.796	0.797	0.794	0.794	0.791	0.800	0.802	0.796	0.793	0.795	OK	OK	LE-02-W
				E. Rel	0.7	1.1	1.3	1.1	1.2	1.3	1.1	1.2	1.4	1.5	1.1	1.1	1.2			
				Buse	A-312-3												---			
03-18	2018	O	O	Ct	0.822												0.822	OK	OK	LE-08-Br
				E. Rel	1.0												1.0			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-19	2018	O	V	Ct	0.765	0.779	0.780	0.772	0.787	0.767	0.774	0.781	0.779	0.781	0.770	0.761	0.775	OK	OK	Atelier Qc
				E. Rel	1.0	0.4	1.0	0.7	0.6	0.0	0.0	0.0	0.0	0.9	1.0	1.0	0.6			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-437-1	A-406-3	A-437-1	A-500-1	A-562-1	---			
03-20	2018	O	V	Ct	0.769	0.779	0.787	0.791	0.795	0.776	0.782	0.788	0.791	0.796	0.785	0.788	0.786	OK	OK	Atelier Qc
				E. Rel	1.3	0.8	1.0	1.1	1.3	1.0	1.1	1.1	1.0	1.1	1.0	1.0	1.1			
				Buse	A-312-3												---			
03-21	2018	O	O	Ct	0.805												0.805	OK	OK	LE-08-Br
				E. Rel	0.4												0.4			
				Buse	A-312-3												---			
03-22	2018	O	N	Ct	0.785												0.785	OK	OK	LE-09-G
				E. Rel	1.1												1.1			
				Buse	A-312-3												---			
03-23	2018	O	O	Ct	0.785												0.785	OK	OK	LE-09-G
				E. Rel	0.0												0.0			

Effectué par: JM / DR / JFG / SA

Date: Février 2018

Endroit de la calibration: Université Laval

Vérifié par: Eric Trépanier

Signature:

Date: 2 mars 2018

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

RÉSUMÉ D'ÉTALONNAGE DES SONDES - S-05 V

Version 1 (02-03-2018)

#	Année	MDF	LV	#	1	2	3	4	5	6	7	8	9	10	11	12	Moy. V	Thermocouple (Validation)	P-T-B	Endroit
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				Buse	A-312-3												---			
05-03	2018	N	O	Ct	0.769												0.769	OK	OK	LE-09-G
				E. Rel	1.5												1.5			
				Buse	A-312-3												---			
05-05	2018	O	O	Ct	0.800												0.800	OK	OK	LE-14-B
				E. Rel	1.0												1.0			
				Buse	5Q-374	5Q-434	5Q-501	5Q-681									---			
05-07	2018	N	Q	Ct	0.783	0.786	0.774	0.792									0.784	OK	OK	Atelier
				E. Rel	1.3	1.3	1.2	1.5									1.3			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
05-08	2018	O	O	Ct	0.786	0.786	0.783	0.780	0.783	0.779	0.779	0.781	0.809	0.804	0.798	0.802	0.789	OK	OK	LE-05-O
				E. Rel	0.4	0.8	0.8	1.3	0.9	1.2	1.3	0.8	1.4	1.2	1.3	1.2	1.1			
				Buse	A-312-3												---			
05-09	2018	O	O	Ct	0.796												0.796	OK	OK	LE-14-B
				E. Rel	1.1												1.1			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
05-10	2018	O	O	Ct	0.792	0.792	0.795	0.794	0.796	0.791	0.793	0.792	0.795	0.798	0.790	0.794	0.794	OK	OK	LE-05-O
				E. Rel	0.7	0.7	0.8	0.4	0.9	0.6	0.7	0.6	0.8	0.0	0.6	0.4	0.6			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-1	A-437-1	A-500-1	A-562-1	---			
05-11	2018	O	O	Ct	0.803	0.798	0.805	0.805	0.802	0.800	0.806	0.801	0.807	0.805	0.803	0.802	0.803	OK	OK	LE-02-W
				E. Rel	0.6	0.9	1.0	1.0	1.0	1.0	0.8	1.2	1.0	1.0	1.0	1.0	1.0			
				Buse	A-312-3												---			
05-12	2018	O	O	Ct	0.783												0.783	OK	OK	LE-15-B
				E. Rel	1.0												1.0			
				Buse	A-312-3												---			
05-13	2018	O	O	Ct	0.808												0.808	OK	OK	LE-11-V
				E. Rel	0.9												0.9			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
05-14	2018	O	O	Ct	0.828	0.824	0.830	0.830	0.830	0.825	0.813	0.816	0.839	0.836	0.832	0.826	0.827	OK	OK	LE-02-W
				E. Rel	0.7	0.0	0.4	0.0	0.4	0.9	1.0	1.5	1.4	0.8	0.8	0.8	0.7			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
05-15	2018	O	O	Ct	0.774	0.778	0.785	0.787	0.783	0.783	0.782	0.783	0.787	0.791	0.777	0.775	0.782	OK	OK	LE-02-W
				E. Rel	1.5	1.3	1.0	1.0	1.1	0.7	0.7	0.7	0.9	0.7	0.4	0.7	0.9			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
05-16	2018	O	O	Ct	0.823	0.819	0.823	0.824	0.818	0.820	0.823	0.820	0.823	0.821	0.816	0.817	0.821	OK	OK	LE-02-W
				E. Rel	0.8	0.9	0.7	0.7	0.0	0.4	0.7	0.9	0.7	0.0	0.0	0.0	0.5			
				Buse	A-312-3												---			
05-18	2018	O	O	Ct	0.767												0.767	OK	OK	LE-08-Br
				E. Rel	0.7												0.7			
				Buse	A-312-3												---			
05-19	2018	O	O	Ct	0.830												0.830	OK	OK	LE-08-Br
				E. Rel	0.7												0.7			
				Buse	A-312-3												---			
05-20	2018	O	O	Ct	0.777												0.777	OK	OK	LE-08-Br
				E. Rel	1.0												1.0			
				Buse	A-125-1	A-180-1	A-218-5	A-250-7	A-280-5	A-312-3	A-343-2	A-375-2	A-406-3	A-437-1	A-500-1	A-562-1	---			
05-21	2018	O	V	Ct	0.812	0.815	0.812	0.808	0.820	0.811	0.820	0.813	0.815	0.817	0.815	0.809	0.814	OK	OK	Atelier Qc
				E. Rel	0.4	0.4	1.0	1.0	0.4	0.0	0.7	0.9	1.0	1.0	1.0	1.0	0.7			
				Buse	A-312-3												---			
05-22	2018	O	O	Ct	0.786												0.786	OK	OK	LE-09-G
				E. Rel	0.7												0.7			

Effectué par: JM / DR / JFG / SA

Date: Février 2018

Endroit de la calibration: Université Laval

Vérifié par: Eric Trépanier

Signature: E T

Date: 2 mars 2018

APPENDIX 4
LABORATORY ANALYSIS REPORT

9770 ROUTE TRANSCANADIENNE
ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
http://www.agatlabs.com

NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC
2022 LAVOISIER LOCAL 125
QUEBEC, QC   G1N4L5
(418) 650-5960

À L'ATTENTION DE: Eric Trépanier

N° DE PROJET: Agnico Eagle/5528

N° BON DE TRAVAIL: 18M395832

HAUTE RÉSOLUTION VÉRIFIÉ PAR: Anastasia Kazakova, chimiste

DATE DU RAPPORT: 2018-11-01

VERSION*: 1

NOMBRE DE PAGES: 7

Si vous désirez de l'information concernant cette analyse, S.V.P. contacter votre chargé de projets au (514) 337-1000.

*NOTES

Nous disposerons des échantillons dans les 30 jours suivants les analyses. S.V.P. Contactez le laboratoire si vous désirez avoir un délai d'entreposage.

Certificat d'analyse

N° BON DE TRAVAIL: 18M395832

N° DE PROJET: Agnico Eagle/5528

AGAT Laboratoires
9770 ROUTE TRANSCANADIENNE
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NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC

À L'ATTENTION DE: Eric Trépanier

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Dioxines et furanes - Air (train d'échantillonnage - OMS 1998)

DATE DE RÉCEPTION: 2018-10-11

DATE DU RAPPORT: 2018-11-01

			IDENTIFICATION DE L'ÉCHANTILLON:	501 à 506 - Inc. -1		507 à 512-Inc.-2		513 à 518-Inc.-3		519 à 524-Inc. -BL
			MATRICE:	Air		Air		Air		Air
			DATE D'ÉCHANTILLONNAGE:	2018-09-22		2018-09-22		2018-09-22		2018-09-22
Paramètre	Unités	C / N	LDR	9616643	LDR	9616650	LDR	9616651	LDR	9616652
2,3,7,8-TCDD (pg total)	pg		1	<1	2	5	7	<7	0.8	<0.8
1,2,3,7,8 PeCDD (pg total)	pg		3	<3	9	47	10	23	2	<2
1,2,3,4,7,8 HxCDD (pg total)	pg		3	<3	7	53	10	28	2	<2
1,2,3,6,7,8 HxCDD (pg total)	pg		3	3	6	71	10	63	2	<2
1,2,3,7,8,9 HxCDD (pg total)	pg		3	<3	7	81	10	65	2	<2
1,2,3,4,6,7,8 HpCDD (pg total)	pg		6	17	10	316	10	307	5	<5
OCDD (pg total)	pg		20	33	10	160	20	300	20	<20
2,3,7,8 TCDF (pg total)	pg		4	15	6	48	9	216	2	<2
1,2,3,7,8 PeCDF (pg total)	pg		8	<8	9	21	20	62	2	<2
2,3,4,7,8-PeCDF (pg total)	pg		6	9	7	43	10	165	2	<2
1,2,3,4,7,8 HxCDF (pg total)	pg		4	13	10	62	10	326	2	<2
1,2,3,6,7,8 HxCDF (pg total)	pg		4	9	10	25	10	120	2	<2
2,3,4,6,7,8-HxCDF (pg total)	pg		4	8	10	50	10	273	2	<2
1,2,3,7,8,9 HxCDF (pg total)	pg		6	<6	20	<20	20	30	3	<3
1,2,3,4,6,7,8 HpCDF (pg total)	pg		3	16	5	64	20	474	2	<2
1,2,3,4,7,8,9 HpCDF (pg total)	pg		6	<6	8	8	20	100	3	<3
OCDF (pg total)	pg		9	20	7	17	30	227	7	<7
Sommation des Tétrachlorodibenzodioxines	pg		1	9	2	159	7	214	0.8	3.3
Sommation des Pentachlorodibenzodioxines	pg		3	11	9	446	10	406	2	8
Sommation des Hexachlorodibenzodioxines	pg		3	25	7	900	10	718	2	5
Sommation des Heptachlorodibenzodioxines	pg		6	20	10	334	10	315	5	<5
Sommation des PCDDs	pg		20	99	10	2000	20	1950	20	<20
Sommation des Tétrachlorodibenzofuranes	pg		4	100	6	282	9	1140	2	20

Certifié par:

AGAT Laboratoires

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Certificat d'analyse

N° BON DE TRAVAIL: 18M395832

N° DE PROJET: Agnico Eagle/5528

NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC

À L'ATTENTION DE: Eric Trépanier

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Dioxines et furanes - Air (train d'échantillonnage - OMS 1998)

DATE DE RÉCEPTION: 2018-10-11

DATE DU RAPPORT: 2018-11-01

	IDENTIFICATION DE L'ÉCHANTILLON:			501 à 506 - Inc. -1		507 à 512-Inc.-2		513 à 518-Inc.-3		519 à 524-Inc. -BL
	MATRICE:			Air		Air		Air		Air
	DATE D'ÉCHANTILLONNAGE:			2018-09-22		2018-09-22		2018-09-22		2018-09-22
Paramètre	Unités	C / N	LDR	9616643	LDR	9616650	LDR	9616651	LDR	9616652
Sommation des Pentachlorodibenzofuranes	pg		8	72	9	406	20	1540	2	15
Sommation des Hexachlorodibenzofuranes	pg		6	32	20	172	20	963	3	3
Sommation des Heptachlorodibenzofuranes	pg		6	28	8	123	20	880	3	5
Sommation des PCDFs	pg		9	253	20	1000	30	4750	7	43
2,3,7,8-Tetra CDD (TEF 1.0)	TEQ			0		5.30		0		0
1,2,3,7,8-Penta CDD (TEF 1.0)	TEQ			0		47.2		23.4		0
1,2,3,4,7,8-Hexa CDD (TEF 0.1)	TEQ			0		5.31		2.83		0
1,2,3,6,7,8-Hexa CDD (TEF 0.1)	TEQ			0.296		7.05		6.32		0
1,2,3,7,8,9-Hexa CDD (TEF 0.1)	TEQ			0		8.11		6.46		0
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)	TEQ			0.171		3.16		3.07		0
Octa CDD (TEF 0.0001)	TEQ			0.00335		0.0160		0.0300		0
2,3,7,8-Tetra CDF (TEF 0.1)	TEQ			1.48		4.84		21.6		0
1,2,3,7,8-Penta CDF (TEF 0.05)	TEQ			0		1.03		3.12		0
2,3,4,7,8-Penta CDF (TEF 0.5)	TEQ			4.36		21.6		82.5		0
1,2,3,4,7,8-Hexa CDF (TEF 0.1)	TEQ			1.30		6.24		32.6		0
1,2,3,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0.926		2.48		12.0		0
2,3,4,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0.818		4.96		27.3		0
1,2,3,7,8,9-Hexa CDF (TEF 0.1)	TEQ			0		0		3.04		0
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)	TEQ			0.162		0.636		4.74		0
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)	TEQ			0		0.0830		0.998		0
Octa CDF (TEF 0.0001)	TEQ			0.00201		0.00173		0.0227		0
Sommation des PCDDs et PCDFs (TEQ)				9.51		118		230		0

Certifié par:

Certificat d'analyse

N° BON DE TRAVAIL: 18M395832
N° DE PROJET: Agnico Eagle/5528

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NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC

À L'ATTENTION DE: Eric Trépanier

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Dioxines et furanes - Air (train d'échantillonnage - OMS 1998)

DATE DE RÉCEPTION: 2018-10-11

DATE DU RAPPORT: 2018-11-01

		IDENTIFICATION DE L'ÉCHANTILLON:	501 à 506 - Inc. -1	507 à 512-Inc.-2	513 à 518-Inc.-3	519 à 524-Inc. -BL
		MATRICE:	Air	Air	Air	Air
		DATE D'ÉCHANTILLONNAGE:	2018-09-22	2018-09-22	2018-09-22	2018-09-22
Étalon de recouvrement	Unités	Limites	9616643	9616650	9616651	9616652
13C-2378-TCDF	%	30-140	56	60	45	54
13C-12378-PeCDF	%	30-140	48	48	38	52
13C-23478-PeCDF	%	30-140	71	60	56	55
13C-123478-HxCDF	%	30-140	84	89	72	73
13C-123678-HxCDF	%	30-140	94	95	68	88
13C-234678-HxCDF	%	30-140	104	109	68	86
13C-123789-HxCDF	%	30-140	94	101	60	72
13C-1234678-HpCDF	%	30-140	70	72	49	64
13C-1234789-HpCDF	%	30-140	57	61	51	55
13C-2378-TCDD	%	30-140	75	73	54	74
13C-12378-PeCDD	%	30-140	65	61	50	60
13C-123478-HxCDD	%	30-140	99	103	72	77
13C-123678-HxCDD	%	30-140	103	117	67	98
13C-1234678-HxCDD	%	30-140	58	62	50	57
13C-OCDD	%	30-140	31	37	33	30

Commentaires: LDR - Limite de détection rapportée; C / N - Critères Normes

9616643-9616652 Le résultat en pg total correspond au composite de chacune des parties du train d'échantillonnage.

Certifié par:

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AGAT Laboratoires

Contrôle de qualité

NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC
N° BON DE TRAVAIL: 18M395832
N° DE PROJET: Agnico Eagle/5528
À L'ATTENTION DE: Eric Trépanier
PRÉLEVÉ PAR:
LIEU DE PRÉLÈVEMENT:

Analyse haute résolution

Date du rapport: 2018-11-01

PARAMÈTRE	Lot	N° éch.	DUPLICATA Dup #1	Dup #2	% d'écart	MATÉRIAU DE RÉFÉRENCE Blanc de méthode	% Récup.	Limites Inf.	Limites Sup.	BLANC FORTIFIÉ % Récup.	Limites Inf.	Limites Sup.	ÉCH. FORTIFIÉ % Récup.	Limites Inf.	Limites Sup.
Dioxines et furanes - Air (train d'échantillonnage - OMS 1998)															
2,3,7,8-TCDD (pg total)	1	MR	32	30	0.0	< 0.7	80%	70%	130%	NA	70%	130%	74%	70%	130%
1,2,3,7,8 PeCDD (pg total)	1	MR	165	178	0.0	< 2	82%	70%	130%	NA	70%	130%	89%	70%	130%
1,2,3,4,7,8 HxCDD (pg total)	1	MR	179	180	0.0	< 2	89%	70%	130%	NA	70%	130%	90%	70%	130%
1,2,3,6,7,8 HxCDD (pg total)	1	MR	197	183	0.0	< 2	99%	70%	130%	NA	70%	130%	92%	70%	130%
1,2,3,7,8,9 HxCDD (pg total)	1	MR	201	183	0.0	< 2	100%	70%	130%	NA	70%	130%	91%	70%	130%
1,2,3,4,6,7,8 HpCDD (pg total)	1	MR	184	179	0.0	< 2	92%	70%	130%	NA	70%	130%	89%	70%	130%
OCDD (pg total)	1	MR	376	341	0.0	< 4	94%	70%	130%	NA	70%	130%	85%	70%	130%
2,3,7,8 TCDF (pg total)	1	MR	37	39	0.0	< 2	92%	70%	130%	NA	70%	130%	97%	70%	130%
1,2,3,7,8 PeCDF (pg total)	1	MR	208	214	0.0	< 2	104%	70%	130%	NA	70%	130%	107%	70%	130%
2,3,4,7,8-PeCDF (pg total)	1	MR	204	215	0.0	< 1	102%	70%	130%	NA	70%	130%	107%	70%	130%
1,2,3,4,7,8 HxCDF (pg total)	1	MR	197	194	0.0	< 2	98%	70%	130%	NA	70%	130%	97%	70%	130%
1,2,3,6,7,8 HxCDF (pg total)	1	MR	209	209	0.0	< 2	105%	70%	130%	NA	70%	130%	105%	70%	130%
2,3,4,6,7,8-HxCDF (pg total)	1	MR	209	203	0.0	< 2	105%	70%	130%	NA	70%	130%	102%	70%	130%
1,2,3,7,8,9 HxCDF (pg total)	1	MR	196	197	0.0	< 3	98%	70%	130%	NA	70%	130%	98%	70%	130%
1,2,3,4,6,7,8 HpCDF (pg total)	1	MR	195	187	0.0	< 2	97%	70%	130%	NA	70%	130%	94%	70%	130%
1,2,3,4,7,8,9 HpCDF (pg total)	1	MR	197	190	0.0	< 3	99%	70%	130%	NA	70%	130%	95%	70%	130%
OCDF (pg total)	1	MR	427	401	0.0	< 3	107%	70%	130%	NA	70%	130%	100%	70%	130%

Certifié par:

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Sommaire de méthode

NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC

N° BON DE TRAVAIL: 18M395832

N° DE PROJET: Agnico Eagle/5528

À L'ATTENTION DE: Eric Trépanier

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

PARAMÈTRE	PRÉPARÉ LE	ANALYSÉ LE	AGAT P.O.N.	RÉFÉRENCE DE LITTÉRATURE	TECHNIQUE ANALYTIQUE
Analyse haute résolution					
2,3,7,8-TCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8 PeCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,7,8 HxCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,6,7,8 HxCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8,9 HxCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,6,7,8 HpCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
OCDD (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,7,8 TCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8 PeCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,4,7,8-PeCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,7,8 HxCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,6,7,8 HxCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,4,6,7,8-HxCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8,9 HxCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,6,7,8 HpCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,7,8,9 HpCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
OCDF (pg total)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Tétrachlorodibenzodioxines	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Pentachlorodibenzodioxines	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Hexachlorodibenzodioxines	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Heptachlorodibenzodioxines	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des PCDDs	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Tétrachlorodibenzofuranes	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Pentachlorodibenzofuranes	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Hexachlorodibenzofuranes	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des Heptachlorodibenzofuranes	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des PCDFs	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,7,8-Tetra CDD (TEF 1.0)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8-Penta CDD (TEF 1.0)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,7,8-Hexa CDD (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,6,7,8-Hexa CDD (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8,9-Hexa CDD (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Octa CDD (TEF 0.0001)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,7,8-Tetra CDF (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8-Penta CDF (TEF 0.05)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,4,7,8-Penta CDF (TEF 0.5)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,7,8-Hexa CDF (TEF 0.1)	2018-10-25	2018-10-31	HR_151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,6,7,8-Hexa CDF (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
2,3,4,6,7,8-Hexa CDF (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,7,8,9-Hexa CDF (TEF 0.1)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS

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Sommaire de méthode

NOM DU CLIENT: CONSULAIR GASTON BOULANGER INC
N° BON DE TRAVAIL: 18M395832
N° DE PROJET: Agnico Eagle/5528
À L'ATTENTION DE: Eric Trépanier
PRÉLEVÉ PAR:
LIEU DE PRÉLÈVEMENT:

PARAMÈTRE	PRÉPARÉ LE	ANALYSÉ LE	AGAT P.O.N.	RÉFÉRENCE DE LITTÉRATURE	TECHNIQUE ANALYTIQUE
Octa CDF (TEF 0.0001)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
Sommation des PCDDs et PCDFs (TEQ)	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-2378-TCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-12378-PeCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-23478-PeCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-123478-HxCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-123678-HxCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-234678-HxCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-123789-HxCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-1234678-HpCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-1234789-HpCDF	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-2378-TCDD	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-12378-PeCDD	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-123478-HxCDD	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-123678-HxCDD	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-1234678-HxCDD	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS
13C-OCDD	2018-10-25	2018-10-31	HR-151-5400	EPA 1613/EPA Method 23	HRMS

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT
LABORATOIRE 483

RAPPORT D'ESSAI

Date : 21 novembre 2018

Réf : P2334-1

Client

 # Client : C8

Nom : Trépanier Éric

Téléphone : (418) 650-5960 # 2208

Courriel : eric.trepanier@consul-air.com

Adresse :
CONSULAIR Québec
125-2022,rue Lavoisier
Québec QC
G1N 4L5 Canada

Résumé du projet

Nb. d'objets : 4

 # Projet lab. : P2334

Votre # projet : 18-5528

Chantier : Agnico-Eagle

Résumé des essais

Paramètre(s) non accrédités

ST	Paramètre	Q.	Principe (Méthode)	Matrice
	Chlorures (Cl)	4	Spectrophotométrie	Eau

ST : Paramètre Sous-Traité

Résultats d'essai(s)

ST	Param.	Échantillon (s)		Dates			Résultat(s)		LDR
		# Lab	*# Client*	*Échantillon.*	*Récep.*	*Essai*	*Valeur*	*Unité*	
	Cl	171018-8	**304 - Inc - B1 - 1**	22-09-18	17-10-18	30-10-18	**86.87**	mg	1.76
		171018-9	**312 - Inc - B1 - 2**	28-09-18	17-10-18	30-10-18	**33.16**	mg	0.73
		171018-10	**320 - Inc - B1 - 3**	29-09-18	17-10-18	30-10-18	**119.33**	mg	1.87
		171018-11	**328 - Bl - Eau - Bl**	23-09-18	17-10-18	30-10-18	**< LDR**	mg	0.04

ST : Essai Sous-Traité
LDR : Limite de Détection Rapportée

Commentaire(s)

1.

Contrôle de qualité

ST	Param.	Date	# Réf	Type	Résultat(s)		LDR
					Valeur	*Unité*	
	Cl	30-10-18	BL3010	BL	< LDR	mg/l	0.39
			MR3010	MR	103.4	% Récup.	-
			AD171018-9	AD	103.1	% Récup.	-
			AD171018-11	AD	101.8	% Récup.	-

ST : Contrôle qualité Sous-Traité
 # Réf : Référence du contrôle qualité dans le système de suivi du laboratoire
BL : Blanc
MR : Matériau de Référence
DP : Duplicata
RP : Réplicata
AD : Ajout Dosé
EA : Étalon Analogue
TM: Témoin de l'extraction
LDR : Limite de Détection Rapportée

Signature

Les résultats ne se rapportent qu'aux objets soumis à l'essai
Tout ou partie de ce document ne peut être reproduit sans l'autorisation du laboratoire de CONSULAIR.
Ce rapport d'essai est certifié par la (les) personne(s) mentionnée(s) ci-après.
Pour toute question concernant ce certificat d'analyse, veuillez vous adresser directement à :

Malha Kirèche

Maxxam
Une société du Groupe Bureau Veritas

Le succès par la science®

Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE
Votre # Bordereau: N/A

Attention: Éric Trépanier
CONSULAIR INC.
2022 Lavoisier
Local 125
Québec, QC
Canada G1N 4L5

Date du rapport: 2018/11/21
Rapport: R2413187
Version: 1 - Finale

CERTIFICAT D'ANALYSES

 # DE DOSSIER MAXXAM: B847715
Reçu: 2018/10/19, 12:30

Matrice: FILTRE
Nombre d'échantillons reçus: 4

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence Primaire
Métaux extractibles totaux par ICP-MS	4	2018/11/06	2018/11/06	STL SOP-00075	MA.200–Mét. 1.2 R5 m

Matrice: Solution barboteur
Nombre d'échantillons reçus: 16

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence Primaire
Mercure par AAVF	2	2018/10/30	2018/10/31	STL SOP-00042	MA.200–Hg 1.1 R1 m
Mercure par AAVF	2	2018/11/01	2018/11/05	STL SOP-00042	MA.200–Hg 1.1 R1 m
Métaux extractibles	5	2018/11/01	2018/11/05	STL SOP-00075	MA.200–Mét. 1.2 R5 m
Métaux extractibles	3	2018/11/06	2018/11/07	STL SOP-00075	MA.200–Mét. 1.2 R5 m
Métaux extractibles	4	2018/11/14	2018/11/17	STL SOP-00075	MA.200–Mét. 1.2 R5 m
Volume d'échantillon	3	2018/11/02	2018/11/02		

Matrice: SOLVANT
Nombre d'échantillons reçus: 4

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence Primaire
Métaux extractibles	4	2018/11/06	2018/11/07	STL SOP-00075	MA.200–Mét. 1.2 R5 m

Matrice: TRAIN
Nombre d'échantillons reçus: 4

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence Primaire
Métaux extractibles	4	2018/11/01	2018/11/08	STL SOP-00075	MA.200–Mét. 1.2 R5 m

Remarques:

Les laboratoires Maxxam sont certifiés ISO/IEC 17025:2005 pour certains paramètres précis des portées d'accréditation. Sauf indication contraire, les méthodes d'analyses utilisées par Maxxam s'inspirent des méthodes de référence d'organismes provinciaux, fédéraux et américains, tels que le CCME, le MDDELCC, l'EPA et l'APHA.

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE
Votre # Bordereau: N/A

Attention: Éric Trépanier

CONSULAIR INC.
2022 Lavoisier
Local 125
Québec, QC
Canada G1N 4L5

Date du rapport: 2018/11/21
Rapport: R2413187
Version: 1 - Finale

CERTIFICAT D'ANALYSES

 # DE DOSSIER MAXXAM: B847715
Reçu: 2018/10/19, 12:30

Toutes les analyses présentées ont été réalisées conformément aux procédures et aux pratiques relatives à la méthodologie, à l'assurance qualité et au contrôle de la qualité généralement appliqués par les employés de Maxxam (sauf s'il en a été convenu autrement par écrit entre le client et Maxxam). Toutes les données de laboratoire rencontrent les contrôles statistiques et respectent tous les critères de CQ et les critères de performance des méthodes, sauf s'il en a été signalé autrement. Tous les blancs de méthode sont rapportés, toutefois, les données des échantillons correspondants ne sont pas corrigées pour la valeur du blanc, sauf indication contraire. Le cas échéant, sauf indication contraire, l'incertitude de mesure n'a pas été prise en considération lors de la déclaration de la conformité à la norme de référence.

Les responsabilités de Maxxam sont restreintes au coût réel de l'analyse, sauf s'il en a été convenu autrement par écrit. Il n'existe aucune autre garantie, explicite ou implicite. Le client a fait appel à Maxxam pour l'analyse de ses échantillons conformément aux méthodes de référence mentionnées dans ce rapport. L'interprétation et l'utilisation des résultats sont sous l'entière responsabilité du client et ne font pas partie des services offerts par Maxxam, sauf si convenu autrement par écrit. Maxxam ne peut pas garantir l'exactitude des résultats qui dépendent des renseignements fournis par le client ou son représentant.

Les résultats des échantillons solides, sauf les biotes, sont rapportés en fonction de la masse sèche, sauf indication contraire. Les analyses organiques ne sont pas corrigées en fonction de la récupération, sauf pour les méthodes de dilution isotopique.
Les résultats s'appliquent seulement aux échantillons analysés. Si l'échantillonnage n'est pas effectué par Maxxam, les résultats se rapportent aux échantillons fournis pour analyse.
Le présent rapport ne doit pas être reproduit, sinon dans son intégralité, sans le consentement écrit du laboratoire.
Lorsque la méthode de référence comprend un suffixe « m », cela signifie que la méthode d'analyse du laboratoire contient des modifications validées et appliquées afin d'améliorer la performance de la méthode de référence.
Notez: Les données brutes sont utilisées pour le calcul du RPD (% d'écart relatif). L'arrondissement des résultats finaux peut expliquer la variation apparente.

Note : Les paramètres inclus dans le présent certificat sont accrédités par le MDDELCC, à moins d'indication contraire.

clé de cryptage

Veuillez adresser toute question concernant ce certificat d'analyse à votre chargé(e) de projets
Argyro Frangoulis, Chargée de projets
Courriel: afrangoulis@maxxam.ca
Téléphone (514)448-9001 Ext:7066229
==
Maxxam a mis en place des procédures qui protègent contre l'utilisation non autorisée de la signature électronique et emploie les «signataires» requis, conformément à la section 5.10.2 de la norme ISO/CEI 17025:2005(E). Veuillez vous référer à la page des signatures de validation pour obtenir les détails des validations pour chaque division.

Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (SOLUTION BARBOTEUR)

ID Maxxam		FX5271	FX5271			FX5389		
Date d'échantillonnage		2018/09/22	2018/09/22			2018/09/22		
# Bordereau		N/A	N/A			N/A		
	Unités	**305-INC-B2345-1 VT:334ML**	**305-INC-B2345-1 VT:334ML Dup. de Lab.**	**LDR**	**Lot CQ**	**307+308-INC-B67-1 VT:615ML**	**LDR**	**Lot CQ**
MÉTAUX								
Aluminium (Al) †	ug	9	8	3	1949070			
Antimoine (Sb) †	ug	<0.3	<0.3	0.3	1949070			
Argent (Ag) †	ug	<2	<2	2	1949070			
Arsenic (As) †	ug	<0.3	<0.3	0.3	1949070			
Baryum (Ba) †	ug	0.2	0.2	0.2	1949070			
Béryllium (Be) †	ug	<0.2	<0.2	0.2	1949070			
Bismuth (Bi) †	ug	<0.2	<0.2	0.2	1949070			
Bore (B) †	ug	2.6	3.6	0.7	1949070			
Cadmium (Cd) †	ug	1.4	1.4	0.2	1949070			
Calcium (Ca) †	ug	126	123	20	1949070			
Chrome (Cr) †	ug	<0.3	<0.3	0.3	1949070			
Cobalt (Co) †	ug	<0.3	<0.3	0.3	1949070			
Cuivre (Cu) †	ug	2.1	1.9	0.3	1949070			
Etain (Sn) †	ug	24	23	2	1949070			
Fer (Fe) †	ug	21	20	20	1949070			
Lithium (Li) †	ug	<3	<3	3	1949070			
Magnésium (Mg) †	ug	96	93	7	1949070			
Manganèse (Mn) †	ug	49.3	49.4	0.3	1949070			
Mercure (Hg)	ug					0.85	0.31	1949380
Mercure (Hg) †	ug	0.4	<0.2	0.2	1949070			
Molybdène (Mo) †	ug	<2	<2	2	1949070			
Nickel (Ni) †	ug	0.4	0.4	0.3	1949070			
Plomb (Pb) †	ug	<2	<2	2	1949070			
Potassium (K) †	ug	34	41	30	1949070			
Sélénium (Se) †	ug	<0.3	<0.3	0.3	1949070			
Silicium (Si) †	ug	46	49	20	1949070			
Sodium (Na) †	ug	<20	<20	20	1949070			
Strontium (Sr) †	ug	<0.3	<0.3	0.3	1949070			
Thallium (Tl) †	ug	<0.3	<0.3	0.3	1949070			
Titane (Ti) †	ug	<3	<3	3	1949070			
Vanadium (V) †	ug	<0.7	<0.7	0.7	1949070			
Zinc (Zn) †	ug	7.5	7.1	0.3	1949070			

LDR = Limite de détection rapportée
Lot CQ = Lot contrôle qualité
Duplicata de laboratoire
† Accréditation non existante pour ce paramètre

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Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (SOLUTION BARBOTEUR)

ID Maxxam		FX5496			FX5497		
Date d'échantillonnage		2018/09/28			2018/09/28		
# Bordereau		N/A			N/A		
	Unités	**313-INC-B2345-2 VT:323ML**	**LDR**	**Lot CQ**	**315+316-INC-B67-2 VT:625ML**	**LDR**	**Lot CQ**
MÉTAUX							
Aluminium (Al) †	ug	7	3	1949070			
Antimoine (Sb) †	ug	<0.3	0.3	1949070			
Argent (Ag) †	ug	<2	2	1949070			
Arsenic (As) †	ug	<0.3	0.3	1949070			
Baryum (Ba) †	ug	0.4	0.2	1949070			
Béryllium (Be) †	ug	<0.2	0.2	1949070			
Bismuth (Bi) †	ug	<0.2	0.2	1949070			
Bore (B) †	ug	0.9	0.6	1949070			
Cadmium (Cd) †	ug	0.5	0.2	1949070			
Calcium (Ca) †	ug	60	20	1949070			
Chrome (Cr) †	ug	<0.3	0.3	1949070			
Cobalt (Co) †	ug	<0.3	0.3	1949070			
Cuivre (Cu) †	ug	0.4	0.3	1949070			
Etain (Sn) †	ug	22	2	1949070			
Fer (Fe) †	ug	<20	20	1949070			
Lithium (Li) †	ug	<3	3	1949070			
Magnésium (Mg) †	ug	13	6	1949070			
Manganèse (Mn) †	ug	3.1	0.3	1949070			
Mercure (Hg)	ug				0.60	0.31	1949380
Mercure (Hg) †	ug	<0.2	0.2	1949070			
Molybdène (Mo) †	ug	<2	2	1949070			
Nickel (Ni) †	ug	<0.3	0.3	1949070			
Plomb (Pb) †	ug	<2	2	1949070			
Potassium (K) †	ug	<30	30	1949070			
Sélénium (Se) †	ug	<0.3	0.3	1949070			
Silicium (Si) †	ug	21	20	1949070			
Sodium (Na) †	ug	<20	20	1949070			
Strontium (Sr) †	ug	<0.3	0.3	1949070			
Thallium (Tl) †	ug	<0.3	0.3	1949070			
Titane (Ti) †	ug	<3	3	1949070			
Vanadium (V) †	ug	<0.6	0.6	1949070			
Zinc (Zn) †	ug	1.3	0.3	1949070			

LDR = Limite de détection rapportée
Lot CQ = Lot contrôle qualité
† Accréditation non existante pour ce paramètre

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Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (SOLUTION BARBOTEUR)

ID Maxxam		FX5498			FX5499		
Date d'échantillonnage		2018/09/29			2018/09/29		
# Bordereau		N/A			N/A		
	Unités	**321-INC-B2345-3 VT:330ML**	**LDR**	**Lot CQ**	**323+324-INC-B67-3 VT:625ML**	**LDR**	**Lot CQ**
MÉTAUX							
Aluminium (Al) †	ug	9	3	1949070			
Antimoine (Sb) †	ug	<0.3	0.3	1949070			
Argent (Ag) †	ug	<2	2	1949070			
Arsenic (As) †	ug	<0.3	0.3	1949070			
Baryum (Ba) †	ug	<0.2	0.2	1949070			
Béryllium (Be) †	ug	<0.2	0.2	1949070			
Bismuth (Bi) †	ug	<0.2	0.2	1949070			
Bore (B) †	ug	6.7	0.7	1949070			
Cadmium (Cd) †	ug	0.3	0.2	1949070			
Calcium (Ca) †	ug	137	20	1949070			
Chrome (Cr) †	ug	<0.3	0.3	1949070			
Cobalt (Co) †	ug	<0.3	0.3	1949070			
Cuivre (Cu) †	ug	2.3	0.3	1949070			
Etain (Sn) †	ug	23	2	1949070			
Fer (Fe) †	ug	54	20	1949070			
Lithium (Li) †	ug	<3	3	1949070			
Magnésium (Mg) †	ug	39	7	1949070			
Manganèse (Mn) †	ug	1.2	0.3	1949070			
Mercure (Hg)	ug				<0.31	0.31	1948181
Mercure (Hg) †	ug	<0.2	0.2	1949070			
Molybdène (Mo) †	ug	<2	2	1949070			
Nickel (Ni) †	ug	0.3	0.3	1949070			
Plomb (Pb) †	ug	<2	2	1949070			
Potassium (K) †	ug	<30	30	1949070			
Sélénium (Se) †	ug	<0.3	0.3	1949070			
Silicium (Si) †	ug	48	20	1949070			
Sodium (Na) †	ug	<20	20	1949070			
Strontium (Sr) †	ug	<0.3	0.3	1949070			
Thallium (Tl) †	ug	<0.3	0.3	1949070			
Titane (Ti) †	ug	<3	3	1949070			
Vanadium (V) †	ug	<0.7	0.7	1949070			
Zinc (Zn) †	ug	4.4	0.3	1949070			

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Lot CQ = Lot contrôle qualité
† Accréditation non existante pour ce paramètre

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (SOLUTION BARBOTEUR)

ID Maxxam		FX5500			FX5502		
Date d'échantillonnage		2018/09/23			2018/09/23		
# Bordereau		N/A			N/A		
	Unités	**329-BL-B123-BL VT:200ML**	**LDR**	**Lot CQ**	**330+331-BL-B56-BL VT:325ML**	**LDR**	**Lot CQ**
MÉTAUX							
Aluminium (Al) †	ug	4	2	1949070			
Antimoine (Sb) †	ug	<0.2	0.2	1949070			
Argent (Ag) †	ug	<1	1	1949070			
Arsenic (As) †	ug	<0.2	0.2	1949070			
Baryum (Ba) †	ug	<0.1	0.1	1949070			
Béryllium (Be) †	ug	<0.1	0.1	1949070			
Bismuth (Bi) †	ug	<0.1	0.1	1949070			
Bore (B) †	ug	0.9	0.4	1949070			
Cadmium (Cd) †	ug	0.8	0.1	1949070			
Calcium (Ca) †	ug	43	10	1949070			
Chrome (Cr) †	ug	0.2	0.2	1949070			
Cobalt (Co) †	ug	<0.2	0.2	1949070			
Cuivre (Cu) †	ug	<0.2	0.2	1949070			
Etain (Sn) †	ug	22	1	1949070			
Fer (Fe) †	ug	19	10	1949070			
Lithium (Li) †	ug	<2	2	1949070			
Magnésium (Mg) †	ug	10	4	1949070			
Manganèse (Mn) †	ug	0.5	0.2	1949070			
Mercure (Hg)	ug				<0.16	0.16	1948181
Mercure (Hg) †	ug	<0.1	0.1	1949070			
Molybdène (Mo) †	ug	<1	1	1949070			
Nickel (Ni) †	ug	<0.2	0.2	1949070			
Plomb (Pb) †	ug	<1	1	1949070			
Potassium (K) †	ug	<20	20	1949070			
Sélénium (Se) †	ug	<0.2	0.2	1949070			
Silicium (Si) †	ug	23	10	1949070			
Sodium (Na) †	ug	<10	10	1949070			
Strontium (Sr) †	ug	<0.2	0.2	1949070			
Thallium (Tl) †	ug	<0.2	0.2	1949070			
Titane (Ti) †	ug	<2	2	1949070			
Vanadium (V) †	ug	<0.4	0.4	1949070			
Zinc (Zn) †	ug	0.5	0.2	1949070			

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Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (SOLUTION BARBOTEUR)

ID Maxxam		FZ0589	FZ0590		FZ0591		
Date d'échantillonnage		2018/09/22	2018/09/28		2018/09/29		
# Bordereau		N/A	N/A		N/A		
	Unités	**304-INC-B1-1 VT:180ML**	**312-INC-B1-2 VT:188ML**	**LDR**	**320-INC-B1-3 VT:240ML**	**LDR**	**Lot CQ**
MÉTAUX							
Aluminium (Al) †	ug	3	3	2	5	2	1952598
Antimoine (Sb) †	ug	<0.2	<0.2	0.2	<0.2	0.2	1952598
Argent (Ag) †	ug	<0.9	<0.9	0.9	<1	1	1952598
Arsenic (As) †	ug	<0.2	<0.2	0.2	<0.2	0.2	1952598
Baryum (Ba) †	ug	0.25	0.15	0.09	0.2	0.1	1952598
Béryllium (Be) †	ug	<0.09	<0.09	0.09	<0.1	0.1	1952598
Bismuth (Bi) †	ug	<0.09	<0.09	0.09	<0.1	0.1	1952598
Bore (B) †	ug	19.9	9.5	0.4	92.6	0.5	1952598
Cadmium (Cd) †	ug	<0.09	<0.09	0.09	<0.1	0.1	1952598
Calcium (Ca) †	ug	18	32	9	17	10	1952598
Chrome (Cr) †	ug	<0.2	<0.2	0.2	<0.2	0.2	1952598
Cobalt (Co) †	ug	<0.2	<0.2	0.2	<0.2	0.2	1952598
Cuivre (Cu) †	ug	0.5	0.7	0.2	<0.2	0.2	1952598
Etain (Sn) †	ug	<0.9	<0.9	0.9	<1	1	1952598
Fer (Fe) †	ug	<9	521	9	<10	10	1952598
Lithium (Li) †	ug	<2	<2	2	<2	2	1952598
Magnésium (Mg) †	ug	5	<4	4	<5	5	1952598
Manganèse (Mn) †	ug	1.9	4.4	0.2	0.3	0.2	1952598
Mercure (Hg) †	ug	<0.09	0.12	0.09	0.1	0.1	1952598
Molybdène (Mo) †	ug	<0.9	<0.9	0.9	<1	1	1952598
Nickel (Ni) †	ug	0.2	0.4	0.2	<0.2	0.2	1952598
Plomb (Pb) †	ug	<0.9	<0.9	0.9	<1	1	1952598
Potassium (K) †	ug	<20	<20	20	<20	20	1952598
Sélénium (Se) †	ug	0.9	0.3	0.2	0.5	0.2	1952598
Silicium (Si) †	ug	12	11	9	148	10	1952598
Sodium (Na) †	ug	<9	<9	9	<10	10	1952598
Strontium (Sr) †	ug	<0.2	<0.2	0.2	<0.2	0.2	1952598
Thallium (Tl) †	ug	<0.2	<0.2	0.2	<0.2	0.2	1952598
Titane (Ti) †	ug	<2	<2	2	<2	2	1952598
Vanadium (V) †	ug	<0.4	<0.4	0.4	<0.5	0.5	1952598
Zinc (Zn) †	ug	2.2	1.3	0.2	0.7	0.2	1952598

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Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (SOLUTION BARBOTEUR)

ID Maxxam		FZ0592		
Date d'échantillonnage		2018/09/23		
# Bordereau		N/A		
	Unités	**328-BL-EAU-BL VT:100ML**	**LDR**	**Lot CQ**
MÉTAUX				
Aluminium (Al) †	ug	<1	1	1952598
Antimoine (Sb) †	ug	<0.1	0.1	1952598
Argent (Ag) †	ug	<0.5	0.5	1952598
Arsenic (As) †	ug	<0.1	0.1	1952598
Baryum (Ba) †	ug	0.07	0.05	1952598
Béryllium (Be) †	ug	<0.05	0.05	1952598
Bismuth (Bi) †	ug	<0.05	0.05	1952598
Bore (B) †	ug	0.6	0.2	1952598
Cadmium (Cd) †	ug	<0.05	0.05	1952598
Calcium (Ca) †	ug	<5	5	1952598
Chrome (Cr) †	ug	<0.1	0.1	1952598
Cobalt (Co) †	ug	<0.1	0.1	1952598
Cuivre (Cu) †	ug	<0.1	0.1	1952598
Etain (Sn) †	ug	<0.5	0.5	1952598
Fer (Fe) †	ug	<5	5	1952598
Lithium (Li) †	ug	<1	1	1952598
Magnésium (Mg) †	ug	<2	2	1952598
Manganèse (Mn) †	ug	0.2	0.1	1952598
Mercure (Hg) †	ug	<0.05	0.05	1952598
Molybdène (Mo) †	ug	<0.5	0.5	1952598
Nickel (Ni) †	ug	<0.1	0.1	1952598
Plomb (Pb) †	ug	<0.5	0.5	1952598
Potassium (K) †	ug	<10	10	1952598
Sélénium (Se) †	ug	<0.1	0.1	1952598
Silicium (Si) †	ug	<5	5	1952598
Sodium (Na) †	ug	<5	5	1952598
Strontium (Sr) †	ug	<0.1	0.1	1952598
Thallium (Tl) †	ug	<0.1	0.1	1952598
Titane (Ti) †	ug	<1	1	1952598
Vanadium (V) †	ug	<0.2	0.2	1952598
Zinc (Zn) †	ug	0.3	0.1	1952598

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Dossier Maxxam: B847715
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CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

PARAMÈTRES CONVENTIONNELS (SOLUTION BARBOTEUR)

ID Maxxam		FY0848	FY0856	FY0857	
Date d'échantillonnage		2018/09/22	2018/09/28	2018/09/29	
# Bordereau		N/A	N/A	N/A	
	Unités	**302-INC-BS-HNO3-1**	**310-INC-BS-HNO3-2**	**318-INC-BS-HNO3-3**	**Lot CQ**
CONVENTIONNELS					
Volume final †	ml	88	110	66	1949618

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Dossier Maxxam: B847715
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CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (TRAIN)

ID Maxxam		FY0848		FY0856		FY0857		
Date d'échantillonnage		2018/09/22		2018/09/28		2018/09/29		
# Bordereau		N/A		N/A		N/A		
	Unités	**301+302+303-INC-1**	**LDR**	**309+310+311-INC-2**	**LDR**	**317+318+319-INC-3**	**LDR**	**Lot CQ**
MÉTAUX								
Aluminium (Al) †	ug	570	2	30	2	46	2	1949322
Antimoine (Sb) †	ug	245	0.1	3.6	0.1	219	0.1	1949322
Argent (Ag) †	ug	0.9	0.5	<0.6	0.6	1.3	0.5	1949322
Arsenic (As) †	ug	17.2	0.1	1.3	0.1	30.9	0.1	1949322
Baryum (Ba) †	ug	7.28	0.05	0.65	0.06	1.06	0.05	1949322
Béryllium (Be) †	ug	<0.05	0.05	<0.06	0.06	<0.05	0.05	1949322
Bismuth (Bi) †	ug	0.84	0.05	0.12	0.06	4.83	0.05	1949322
Bore (B) †	ug	4.1	0.5	4.0	0.5	3.7	0.5	1949322
Cadmium (Cd) †	ug	2.47	0.05	0.45	0.06	9.52	0.05	1949322
Calcium (Ca) †	ug	1930	50	309	50	243	50	1949322
Chrome (Cr) †	ug	18.2	0.1	5.1	0.1	73.4	0.1	1949322
Cobalt (Co) †	ug	0.5	0.1	<0.1	0.1	0.2	0.1	1949322
Cuivre (Cu) †	ug	89.1	0.1	24.7	0.1	131	0.1	1949322
Etain (Sn) †	ug	77.4	0.5	4.0	0.6	166	0.5	1949322
Fer (Fe) †	ug	1070	5	33	6	82	5	1949322
Lithium (Li) †	ug	8	1	33	1	32	1	1949322
Magnésium (Mg) †	ug	216	2	34	2	36	2	1949322
Manganèse (Mn) †	ug	16.5	0.1	15.7	0.1	4.3	0.1	1949322
Mercure (Hg)	ug	<0.1	0.1	<0.1	0.1	<0.1	0.1	1949322
Molybdène (Mo) †	ug	4.8	0.5	<0.6	0.6	8.9	0.5	1949322
Nickel (Ni) †	ug	8.1	0.3	0.4	0.3	2.0	0.3	1949322
Plomb (Pb) †	ug	127	0.5	36.0	0.6	444	0.5	1949322
Potassium (K) †	ug	10100	10	1170	10	10200	10	1949322
Sélénium (Se) †	ug	<0.5	0.5	<0.5	0.5	0.5	0.5	1949322
Silicium (Si) †	ug	717	5	148	6	397	5	1949322
Sodium (Na) †	ug	7900	10	851	10	6890	10	1949322
Strontium (Sr) †	ug	5.0	0.1	0.4	0.1	0.4	0.1	1949322
Thallium (Tl) †	ug	<0.1	0.1	<0.1	0.1	<0.1	0.1	1949322
Titane (Ti) †	ug	52	1	4	1	6	1	1949322
Vanadium (V) †	ug	0.8	0.2	<0.2	0.2	0.4	0.2	1949322
Zinc (Zn) †	ug	509	1	54	1	1070	1	1949322

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Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

MÉTAUX (TRAIN)

ID Maxxam		FY0858		
Date d'échantillonnage		2018/09/23		
# Bordereau		N/A		
	Unités	**325+326+327-BL-BL**	**LDR**	**Lot CQ**
MÉTAUX				
Aluminium (Al) †	ug	4	3	1949322
Antimoine (Sb) †	ug	<0.3	0.3	1949322
Argent (Ag) †	ug	<2	2	1949322
Arsenic (As) †	ug	<0.3	0.3	1949322
Baryum (Ba) †	ug	0.2	0.2	1949322
Béryllium (Be) †	ug	<0.2	0.2	1949322
Bismuth (Bi) †	ug	<0.2	0.2	1949322
Bore (B) †	ug	4.4	0.6	1949322
Cadmium (Cd) †	ug	<0.2	0.2	1949322
Calcium (Ca) †	ug	<50	50	1949322
Chrome (Cr) †	ug	11.0	0.3	1949322
Cobalt (Co) †	ug	<0.3	0.3	1949322
Cuivre (Cu) †	ug	0.3	0.3	1949322
Etain (Sn) †	ug	<2	2	1949322
Fer (Fe) †	ug	<20	20	1949322
Lithium (Li) †	ug	<3	3	1949322
Magnésium (Mg) †	ug	8	6	1949322
Manganèse (Mn) †	ug	<0.3	0.3	1949322
Mercure (Hg)	ug	<0.2	0.2	1949322
Molybdène (Mo) †	ug	<2	2	1949322
Nickel (Ni) †	ug	<0.3	0.3	1949322
Plomb (Pb) †	ug	<2	2	1949322
Potassium (K) †	ug	<30	30	1949322
Sélénium (Se) †	ug	<0.5	0.5	1949322
Silicium (Si) †	ug	63	20	1949322
Sodium (Na) †	ug	143	20	1949322
Strontium (Sr) †	ug	<0.3	0.3	1949322
Thallium (Tl) †	ug	<0.3	0.3	1949322
Titane (Ti) †	ug	<3	3	1949322
Vanadium (V) †	ug	<0.6	0.6	1949322
Zinc (Zn) †	ug	<1	1	1949322

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889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

REMARQUES GÉNÉRALES

MÉTAUX (SOLUTION BARBOTEUR)

Les limites de détection indiquées sont modifiées en fonction du volume d'échantillon reçu.

MÉTAUX (TRAIN)

Les limites de détections indiquées sont multipliées par les facteurs de dilution utilisés pour l'analyse des échantillons.
Les limites de détection indiquées sont modifiées en fonction du volume d'échantillon reçu.

Les résultats ne se rapportent qu’aux échantillons soumis pour analyse

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

RAPPORT ASSURANCE QUALITÉ

Lot AQ/CQ	Init	Type CQ	Groupe	Date Analysé	Valeur	Réc	Unités
1948181	EHA	Blanc fortifié	Mercure (Hg)	2018/10/31		160 (1)	%
1948181	EHA	Blanc de méthode	Mercure (Hg)	2018/10/31	<0.050		ug
1949070	EHA	Blanc fortifié	Aluminium (Al)	2018/11/05		105	%
			Antimoine (Sb)	2018/11/05		110	%
			Argent (Ag)	2018/11/05		102	%
			Arsenic (As)	2018/11/05		110	%
			Baryum (Ba)	2018/11/05		106	%
			Béryllium (Be)	2018/11/05		104	%
			Bismuth (Bi)	2018/11/05		108	%
			Bore (B)	2018/11/05		112	%
			Cadmium (Cd)	2018/11/05		105	%
			Calcium (Ca)	2018/11/05		107	%
			Chrome (Cr)	2018/11/05		105	%
			Cobalt (Co)	2018/11/05		105	%
			Cuivre (Cu)	2018/11/05		106	%
			Etain (Sn)	2018/11/05		112	%
			Fer (Fe)	2018/11/05		107	%
			Lithium (Li)	2018/11/05		106	%
			Magnésium (Mg)	2018/11/05		105	%
			Manganèse (Mn)	2018/11/05		107	%
			Mercure (Hg)	2018/11/05		119	%
			Molybdène (Mo)	2018/11/05		110	%
			Nickel (Ni)	2018/11/05		104	%
			Plomb (Pb)	2018/11/05		109	%
			Potassium (K)	2018/11/05		101	%
			Sélénium (Se)	2018/11/05		109	%
			Silicium (Si)	2018/11/05		99	%
			Sodium (Na)	2018/11/05		107	%
			Strontium (Sr)	2018/11/05		118	%
			Thallium (Tl)	2018/11/05		107	%
			Titane (Ti)	2018/11/05		102	%
			Vanadium (V)	2018/11/05		107	%
			Zinc (Zn)	2018/11/05		103	%
1949070	EHA	Blanc de méthode	Aluminium (Al)	2018/11/05	<1		ug
			Antimoine (Sb)	2018/11/05	<0.1		ug
			Argent (Ag)	2018/11/05	<0.5		ug
			Arsenic (As)	2018/11/05	<0.1		ug
			Baryum (Ba)	2018/11/05	<0.05		ug
			Béryllium (Be)	2018/11/05	<0.05		ug
			Bismuth (Bi)	2018/11/05	<0.05		ug
			Bore (B)	2018/11/05	<0.2		ug
			Cadmium (Cd)	2018/11/05	<0.05		ug
			Calcium (Ca)	2018/11/05	<5		ug
			Chrome (Cr)	2018/11/05	<0.1		ug
			Cobalt (Co)	2018/11/05	<0.1		ug
			Cuivre (Cu)	2018/11/05	<0.1		ug
			Etain (Sn)	2018/11/05	<0.5		ug
			Fer (Fe)	2018/11/05	<5		ug
			Lithium (Li)	2018/11/05	<1		ug
			Magnésium (Mg)	2018/11/05	<2		ug
			Manganèse (Mn)	2018/11/05	<0.1		ug
			Mercure (Hg)	2018/11/05	<0.05		ug

Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

RAPPORT ASSURANCE QUALITÉ (SUITE)

Lot AQ/CQ	Init	Type CQ	Groupe	Date Analysé	Valeur	Réc	Unités
			Molybdène (Mo)	2018/11/05	<0.5		ug
			Nickel (Ni)	2018/11/05	<0.1		ug
			Plomb (Pb)	2018/11/05	<0.5		ug
			Potassium (K)	2018/11/05	<10		ug
			Sélénium (Se)	2018/11/05	<0.1		ug
			Silicium (Si)	2018/11/05	<5		ug
			Sodium (Na)	2018/11/05	<5		ug
			Strontium (Sr)	2018/11/05	<0.1		ug
			Thallium (Tl)	2018/11/05	<0.1		ug
			Titane (Ti)	2018/11/05	<1		ug
			Vanadium (V)	2018/11/05	<0.2		ug
			Zinc (Zn)	2018/11/05	<0.1		ug
1949380	SD2	MRC	Mercure (Hg)	2018/11/05		110	%
1949380	SD2	Blanc fortifié	Mercure (Hg)	2018/11/05		125 (1)	%
1949380	SD2	Blanc de méthode	Mercure (Hg)	2018/11/05	<0.050		ug
1952598	EHA	Blanc fortifié	Aluminium (Al)	2018/11/17		102	%
			Antimoine (Sb)	2018/11/17		100	%
			Argent (Ag)	2018/11/17		115	%
			Arsenic (As)	2018/11/17		104	%
			Baryum (Ba)	2018/11/17		113	%
			Béryllium (Be)	2018/11/17		101	%
			Bismuth (Bi)	2018/11/17		98	%
			Bore (B)	2018/11/17		105	%
			Cadmium (Cd)	2018/11/17		96	%
			Calcium (Ca)	2018/11/17		98	%
			Chrome (Cr)	2018/11/17		102	%
			Cobalt (Co)	2018/11/17		98	%
			Cuivre (Cu)	2018/11/17		100	%
			Etain (Sn)	2018/11/17		106	%
			Fer (Fe)	2018/11/17		98	%
			Lithium (Li)	2018/11/17		100	%
			Magnésium (Mg)	2018/11/17		98	%
			Manganèse (Mn)	2018/11/17		105	%
			Mercure (Hg)	2018/11/17		108	%
			Molybdène (Mo)	2018/11/17		102	%
			Nickel (Ni)	2018/11/17		98	%
			Plomb (Pb)	2018/11/17		101	%
			Potassium (K)	2018/11/17		98	%
			Sélénium (Se)	2018/11/17		103	%
			Silicium (Si)	2018/11/17		98	%
			Sodium (Na)	2018/11/17		104	%
			Strontium (Sr)	2018/11/17		109	%
			Thallium (Tl)	2018/11/17		97	%
			Titane (Ti)	2018/11/17		105	%
			Vanadium (V)	2018/11/17		102	%
			Zinc (Zn)	2018/11/17		111	%
1952598	EHA	Blanc de méthode	Aluminium (Al)	2018/11/17	<1		ug
			Antimoine (Sb)	2018/11/17	<0.1		ug
			Argent (Ag)	2018/11/17	<0.5		ug
			Arsenic (As)	2018/11/17	<0.1		ug
			Baryum (Ba)	2018/11/17	<0.05		ug
			Béryllium (Be)	2018/11/17	<0.05		ug

Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

RAPPORT ASSURANCE QUALITÉ (SUITE)

Lot AQ/CQ	Init	Type CQ	Groupe	Date Analysé	Valeur	Réc	Unités
			Bismuth (Bi)	2018/11/17	<0.05		ug
			Bore (B)	2018/11/17	0.2, LDR=0.2		ug
			Cadmium (Cd)	2018/11/17	<0.05		ug
			Calcium (Ca)	2018/11/17	<5		ug
			Chrome (Cr)	2018/11/17	<0.1		ug
			Cobalt (Co)	2018/11/17	<0.1		ug
			Cuivre (Cu)	2018/11/17	<0.1		ug
			Etain (Sn)	2018/11/17	<0.5		ug
			Fer (Fe)	2018/11/17	<5		ug
			Lithium (Li)	2018/11/17	<1		ug
			Magnésium (Mg)	2018/11/17	<2		ug
			Manganèse (Mn)	2018/11/17	<0.1		ug
			Mercure (Hg)	2018/11/17	<0.05		ug
			Molybdène (Mo)	2018/11/17	<0.5		ug
			Nickel (Ni)	2018/11/17	<0.1		ug
			Plomb (Pb)	2018/11/17	<0.5		ug
			Potassium (K)	2018/11/17	<10		ug
			Sélénium (Se)	2018/11/17	<0.1		ug
			Silicium (Si)	2018/11/17	<5		ug
			Sodium (Na)	2018/11/17	<5		ug
			Strontium (Sr)	2018/11/17	<0.1		ug
			Thallium (Tl)	2018/11/17	<0.1		ug
			Titane (Ti)	2018/11/17	<1		ug
			Vanadium (V)	2018/11/17	<0.2		ug
			Zinc (Zn)	2018/11/17	<0.1		ug

LDR = Limite de détection rapportée

MRC: Un échantillon de concentration connue préparé dans des conditions rigoureuses par un organisme externe. Utilisé pour vérifier la justesse de la méthode.

Blanc fortifié: Un blanc, d’une matrice exempte de contaminants, auquel a été ajouté une quantité connue d'analyte provenant généralement d'une deuxième source. Utilisé pour évaluer la précision de la méthode.

Blanc de méthode: Une partie aliquote de matrice pure soumise au même processus analytique que les échantillons, du prétraitement au dosage. Sert à évaluer toutes contaminations du laboratoire.

Réc = Récupération

(1) La récupération ou l'écart relatif (RPD) pour ce composé est en dehors des limites de contrôle, mais l’ensemble du contrôle qualité rencontre les critères d’acceptabilité pour cette analyse

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Dossier Maxxam: B847715
Date du rapport: 2018/11/21

CONSULAIR INC.
Votre # du projet: 18-5528
Adresse du site: AGNICO EAGLE MELIADINE

PAGE DES SIGNATURES DE VALIDATION

Les résultats analytiques ainsi que les données de contrôle-qualité contenus dans ce rapport furent vérifiés et validés par les personnes suivantes:

CHIMISTE Faouzi Sarsi 2005-093 QUÉBEC

Faouzi Sarsi, B. Sc. Chimiste

CHIMISTE Myriam Assayag 2012-138 QUÉBEC

Miryam Assayag, B.Sc. Chimiste

Maxxam a mis en place des procédures qui protègent contre l'utilisation non autorisée de la signature électronique et emploie les «signataires» requis, conformément à la section 5.10.2 de la norme ISO/CEI 17025:2005(E). Veuillez vous référer à la page des signatures de validation pour obtenir les détails des validations pour chaque division.

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CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

CHAÎNE DE RESPONSABILITÉ

2022-125, rue Lavoisier
Québec (Qc) G1N 4L5
Tél..: (418) 650-5960
Fax : (418) 704-2221
www.consul-air.com

Travaux effectués à : Agnico Eagle Meliadine
Projet #: 18-5528
Chargé de Projet : Eric Trépanier

LABORATOIRE RESPONSABLE DES ANALYSES :
Maxxam
889 Montée de Liesse
Ville St-Laurent (Qc) H4T 1P5
Téléphone : (514) 448-9001
Télécopieur : (514) 448-5922

ÉCHANTILLON	Matrice	Fraction	Qte	Date	Paramètres	Unité	Remarque
301 - Inc - BS-Acétone - 1	Acétone	BS-Acétone	1	2018-09-22	Métaux, Hg	mg	Combiner les échantillons 301 à 303 pour les métaux particulaires de la source Inc - Essai #1
302 - Inc - BS-HNO3 - 1	HNO3	BS-HNO3	1	2018-09-22	Métaux, Hg	mg	Combiner avec les échantillons 301 et 303 pour les métaux particulaires de la source Inc - Essai #1
303 - Inc - Filtre - 1	Filtre	Poids avant : 0.5266 gr	1	2018-09-22	Métaux, Hg	mg	Combiner les échantillons 301 à 303 pour les métaux particulaires de la source Inc - Essai #1
304 - Inc - B1 - 1	Eau	B1 - Vt: 180 mL	1	2018-09-22	Métaux, Hg	mg	
305 - Inc - B2345 - 1	H2O2 10% / HNO3 5%	B2345 - Vt: 334 mL	1	2018-09-22	Métaux, Hg	mg	
307 - Inc - B67 - 1	KMNO4 4%/H2SO4 10%	B67 - Vt: 390 mL	1	2018-09-22	Hg	mg	Combiner les échantillons 307 et 308 pour le Hg de la source Inc - Essai #1

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19-Oct-18 12:30
Argyro Frangoulis
B847715
AM1

REMIS PAR:	DATE:	HEURE:
REÇU PAR: Viuol Osalos	DATE: 2018/10/19	HEURE: 12:30

Page 1 de 5

ICE : YES
SEAL : NO

DRIVER 7, 7, 6

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

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Travaux effectués à : Agnico Eagle Meliadine

Projet #: ______________________

Chargé de Projet : ______________________

LABORATOIRE RESPONSABLE DES ANALYSES :
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Ville St-Laurent (Qc) H4T 1P5
Téléphone : (514) 448-9001
Télécopieur : (514) 448-5922

ÉCHANTILLON	Matrice	Fraction	Qte	Date	Paramètres	Unité	Remarque
308 - Inc - B67-HCl - 1	HCl	B67-HCl - Vt: 225 mL	1	2018-09-22	Hg	mg	Combiner les échantillons 307 et 308 pour le Hg de la source Inc - Essai #1
309 - Inc - BS-Acétone - 2	Acétone	BS-Acétone	1	2018-09-28	Métaux, Hg	mg	Combiner les échantillons 309 à 311 pour les métaux particulaires de la source Inc - Essai #2
310 - Inc - BS-HNO3 - 2	HNO3	BS-HNO3	1	2018-09-28	Métaux, Hg	mg	Combiner avec les échantillons 309 et 311 pour les métaux particulaires de la source Inc - Essai #2
311 - Inc - Filtre - 2	Filtre	Poids avant : 0.5248 gr	1	2018-09-28	Métaux, Hg	mg	Combiner les échantillons 309 à 311 pour les métaux particulaires de la source Inc - Essai #2
312 - Inc - B1 - 2	Eau	B1 - Vt: 188 mL	1	2018-09-28	Métaux, Hg	mg	
313 - Inc - B2345 - 2	H2O2 10% / HNO3 5%	B2345 - Vt: 323 mL	1	2018-09-28	Métaux, Hg	mg	

REMIS PAR:	DATE:	HEURE:
REÇU PAR: Vivian Dawlas	DATE: 10/10/19	HEURE: 12:30

Page 2 de 5

ICE: YES
SEAL: NO

WT: 533.

DRIVEZ

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

CHAÎNE DE RESPONSABILITÉ

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Travaux effectués à : Agnico Eagle Meliadine

Projet #: ____________

Chargé de Projet : ____________

LABORATOIRE RESPONSABLE DES ANALYSES :
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Télécopieur : (514) 448-5922

ÉCHANTILLON	Matrice	Fraction	Qte	Date	Paramètres	Unité	Remarque
315 - Inc - B67 - 2	KMNO4 4%/H2SO4 10%	B67 - Vt: 400 mL	1	2018-09-28	Hg	mg	Combiner les échantillons 315 et 316 pour le Hg de la source Inc - Essai #2
316 - Inc - B67-HCl - 2	HCl	B67-HCl - Vt: 225 mL	1	2018-09-28	Hg	mg	Combiner les échantillons 315 et 316 pour le Hg de la source Inc - Essai #2
317 - Inc - BS-Acétone - 3	Acétone	BS-Acétone	1	2018-09-29	Métaux, Hg	mg	Combiner les échantillons 317 à 319 pour les métaux particulaires de la source Inc - Essai #3
318 - Inc - BS-HNO3 - 3	HNO3	BS-HNO3	1	2018-09-29	Métaux, Hg	mg	Combiner avec les échantillons 317 et 319 pour les métaux particulaires de la source Inc - Essai #3
319 - Inc - Filtre - 3	Filtre	Poids avant : 0.5182 gr	1	2018-09-29	Métaux, Hg	mg	Combiner les échantillons 317 à 319 pour les métaux particulaires de la source Inc - Essai #3
320 - Inc - B1 - 3	Eau	B1 - Vt: 240 mL	1	2018-09-29	Métaux, Hg	mg	

ICE: YES
SEAL: NO

REMIS PAR:	DATE: 2018/10/19	HEURE: 12:30
REÇU PAR: Vikas Dariot	DATE:	HEURE:

Page 3 de 5

DRIVER 7,7,6

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT	**CHAÎNE DE RESPONSABILITÉ**

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Fax : (418) 704-2221
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Travaux effectués à : Agnico Eagle Meliadine

Projet #: ____________________

Chargé de Projet : ____________________

LABORATOIRE RESPONSABLE DES ANALYSES :
Maxxam
889 Montée de Liesse
Ville St-Laurent (Qc) H4T 1P5
Téléphone : (514) 448-9001
Télécopieur : (514) 448-5922

ÉCHANTILLON	Matrice	Fraction	Qte	Date	Paramètres	Unité	Remarque
321 - Inc - B2345 - 3	H2O2 10% / HNO3 5%	B2345 - Vt: 330 mL	1	2018-09-29	Métaux, Hg	mg	
323 - Inc - B67 - 3	KMNO4 4%/H2SO4 10%	B67 - Vt: 400 mL	1	2018-09-29	Hg	mg	Combiner les échantillons 323 et 324 pour le Hg de la source Inc - Essai #3
324 - Inc - B67-HCl - 3	HCl	B67-HCl - Vt: 225 mL	1	2018-09-29	Hg	mg	Combiner les échantillons 323 et 324 pour le Hg de la source Inc - Essai #3
325 - Bl - BS-Acétone - Bl	Acétone	BS-Acétone - Vt: 100 mL	1	2018-09-23	Métaux, Hg	mg	Combiner les échantillons 325 à 327 pour les métaux particulaires de la source Blanc - Essai #Bl
326 - Bl - BS-HNO3 - Bl	HNO3	BS-HNO3 - Vt: 300 mL	1	2018-09-23	Métaux, Hg	mg	Combiner avec les échantillons 325 et 327 pour les métaux particulaires de la source Blanc - Essai #Bl
327 - Bl - Filtre - Bl	Filtre	Poids avant : 0.5176 gr	1	2018-09-23	Métaux, Hg	mg	Combiner les échantillons 325 à 327 pour les métaux particulaires de la source Blanc - Essai #Bl

REMIS PAR:	DATE: 2018/10/19	HEURE: 12:30
REÇU PAR: Jiuel DAVIDS	DATE:	HEURE:

ICE: yes
SEAL: no

Page 4 de 5

DAIVA 7,7,6

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

CHAÎNE DE RESPONSABILITÉ

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Québec (Qc) G1N 4L5
Tél.: (418) 650-5960
Fax : (418) 704-2221
www.consul-air.com

Travaux effectués à : Agnico Eagle - Meliadine

Projet #:

Chargé de Projet :

LABORATOIRE RESPONSABLE DES ANALYSES :
Maxxam
889 Montée de Liesse
Ville St-Laurent (Qc) H4T 1P5
Téléphone : (514) 448-9001
Télécopieur : (514) 448-5922

ÉCHANTILLON	Matrice	Fraction	Qte	Date	Paramètres	Unité	Remarque
328 - BI - Eau - BI	Eau	Eau - Vt: 100 mL	1	2018-09-23	Métaux, Hg	mg	
329 - BI - B123 - BI	H2O2 10% / HNO3 5%	B123 - Vt: 200 mL	1	2018-09-23	Métaux, Hg	mg	
330 - BI - B56 - BI	KMNO4 4%/H2SO4 10%	B56 - Vt: 100 mL	1	2018-09-23	Hg	mg	Combiner les échantillons 330 et 331 pour le Hg de la source Blanc - Essai #BI
331 - BI - B56-HCl - BI	HCl	B56-HCl - Vt: 225 mL	1	2018-09-23	Hg	mg	Combiner les échantillons 330 et 331 pour le Hg de la source Blanc - Essai #BI

REMIS PAR:	DATE:	HEURE:
REÇU PAR: Stacey Davids	DATE: 2018/10/19	HEURE: 12:30

Page 5 de 5

DRIVER 4,7,6 ICE: YES SEAL: NO

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

Québec, le lundi 15 octobre 2018
Argyro Frangoulis
Maxxam
Ligne Directe: 514.448.9001 #6229
Courriel: AFrangoulis@maxxam.ca

Objet :	**Explications de la demande d'analyses pour le projet de Agnico Eagle (Meliadine).**
Notre no de projet :	**#18-5528**

Bonjour Argyro,

Voici la demande d'analyse concernant le dossier mentionné précédemment. Les mesures ont été effectuées du 22 au 29 septembre 2018. Les échantillons se retrouvent dans une glacière. À cela suivra plus tard les échantillons des métaux particulaires et les échantillons d'eau (# 304, 312, 320 et 328).

DEMANDE D'ANALYSES / MÉTAUX

Les fractions filtres et buse-sonde acétone vous seront envoyées un peu plus tard afin de faire l'analyse pour les métaux particulaires. Pour chacun des essais, nous voulons un résultat combiné des 2 fractions Buse-Sonde (Acétone et HNO_3) et le Filtre (donc 3 échantillons à combiner ex. éch.# 301, 302 et 303 – 309, 310 et 311 etc. Aussi, pour le Mercure d'un même essai, les fractions de $KmnO_4$ (BB56) et de HCl 8N (BB56-HCL) doivent être combinées (ex. éch.# 307 et 308). Il est important de respecter ces combinaisons exigées.

Il y a aussi les échantillons d'eau, # 304, 312, 320 et 328 qui vont arriver plus tard. L'analyse des métaux et du Hg sera également à faire.

Les métaux à analyser sont les suivants : Al, Sb, Ag, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Sn, Fe, Li, Mg, Mn, Mo, Ni, Pb, K, Se, Na, Ti, V, Zn, Sr, Tl, Si (Silicium soluble), Hg

Il est important de ne pas jeter les échantillons et de nous les retourner après l'analyse.

Pour des renseignements supplémentaires n'hésitez pas à communiquer avec nous.

Envoyer les résultats à eric.trepanier@consul-air.com.

Salutations,

Eric Trépanier

www.consul-air.com

Siège Social : 2022, Lavoisier, bureau 125, Québec (Québec) G1N 4L5 Téléphone : (418) 650-5960 1-866-6969-AIR Télécopieur : (418) 704-2221
Bureau de Montréal : 600, Leclerc, Repentigny (Québec) J6A 2E5 Téléphone : (450) 654-8000 Télécopieur : (450) 654-6730

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT
LABORATOIRE 483

Envoi pour analyse à Maxxam
Date: 24/10/2018
Chantier: Agnico Eagle(Meliadine)
Projet: 18-5528
Projet Lab: P2333

# du Labo	# de l'échantillon	# Bécher	Date d'envoi	Retour
171018-1	301 - Inc - BS-Acétone - 1	368	24-10-2018	
171018-2	309 - Inc - BS-Acétone - 2	716	24-10-2018	
171018-3	317 - Inc - BS-Acétone - 3	735	24-10-2018	
171018-4	325 - BI - BS-Acétone - BI	#453	24-10-2018	

Note:Nous retourner SVP les béchers aprés analyse dans leurs boîtes à:

Consulair
Bureau de Repentigny
101-800 Rue Leclerc
Repentigny (Qc), J6A 2E5
Tél: (450) 654-8000 poste 2304
Fax: (450) 654-6730
Courriel: laboratoire@consul-air.com

B847715_COC

No Laurie Dowrey
2018/10/24
13:00.
ice-no
Rele to
driver.

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT
LABORATOIRE 483

RAPPORT D'ESSAI

Date : 25 octobre 2018

Réf : P2338-1

Client

 # Client : C8

Nom : Trépanier Éric

Téléphone : (418) 650-5960 # 2208

Courriel : eric.trepanier@consul-air.com

Adresse :
CONSULAIR Québec
125-2022,rue Lavoisier
Québec QC
G1N 4L5 Canada

Résumé du projet

Nb. d'objets : 7

 # Projet lab. : P2338

Votre # projet : 18-5517

Chantier : Agnico-Eagle

Résumé des essais

Paramètre(s) accrédités

ST	Paramètre	Q.	Principe (Méthode)	Matrice
	Matières particulaires (MP-A)	4	Gravimétrie (LPT1)	Acétone
	Matières particulaires (MP-F)	3	Gravimétrie (LPT2)	Filtre

ST : paramètre Sous-Traité

Résultats d'essai(s)

ST	Param.	Échantillon (s)		Dates			Résultat(s)		LDR
		# Lab	# Client	Échantillon.	Récep.	Essai	Valeur	Unité	
	MP-A	191018-1	**301 - Inc - BS-Acétone - 1**	05-10-18	19-10-18	19-10-18	**37.0**	mg	1.0
		191018-2	**309 - Inc - BS-Acétone - 2**	06-10-18	19-10-18	19-10-18	**53.1**	mg	1.0
		191018-3	**317 - Inc - BS-Acétone - 3**	07-10-18	19-10-18	19-10-18	**5.3**	mg	1.0
		191018-4	**325 - Bl - BS-Acétone - Bl**	06-10-18	19-10-18	19-10-18	**< LDR**	mg	1.0
	MP-F	191018-5	**303 - Inc - Filtre - 1**	05-10-18	19-10-18	24-10-18	**48.2**	mg	0.1
		191018-6	**311 - Inc - Filtre - 2**	06-10-18	19-10-18	24-10-18	**48.4**	mg	0.1
		191018-7	**319 - Inc - Filtre - 3**	07-10-18	19-10-18	24-10-18	**46.0**	mg	0.1

ST : Essai Sous-Traité
LDR : Limite de Détection Rapportée

Commentaire(s)

1. LPT1 & LPT2: Méthode MA.100-Part 1.0 (Domaine 400 de Chimie de l'air)
2. Le volume de l'échantillon 191018-4 ; V= 110 ml.

Contrôle de qualité

ST	Param.	Date	# Réf	Type	Résultat(s)		LDR
					Valeur	Unité	
	MP-A	19-10-18	BL1910	BL	< LDR	mg	1.0
			MR1910	MR	100.7	% Récup.	-
	MP-F	24-10-18	AP- 02 Conforme	-	-	mg	0.1

ST : Contrôle qualité Sous-Traité
 # Réf : Référence du contrôle qualité dans le système de suivi du laboratoire
BL : Blanc
MR : Matériau de Référence
DP : Duplicata
RP : Réplicata
AD : Ajout Dosé
EA : Étalon Analogue
TM: Témoin de l'extraction
LDR : Limite de Détection Rapportée

Signature

Les résultats ne se rapportent qu'aux objets soumis à l'essai
Tout ou partie de ce document ne peut être reproduit sans l'autorisation du laboratoire de CONSULAIR.
Ce rapport d'essai est certifié par la (les) personne(s) mentionnée(s) ci-après.
Pour toute question concernant ce certificat d'analyse, veuillez vous adresser directement à :

Malha Kirèche

APPENDIX 5
RAW FIELD DATA

CONSULAIR

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : ME. E1

February/2017

Usine : AE. Meliadine	Date : 22.05.2018	P. Bar (po Hg) :	# Cold box : ME-1
Ville: Rankin Inlet		P. Stat. (po H_2O) :	
ID point d'émission : Incinerateur	Sonde N° : 05-07	Module N° : #25 NC	K' : 38.14
Diamètre : 32.5	Cp : 0.774	Kc : 0.999	
Distance avant : 5D	Buse N° : SQ-502	Ko : 0.733	Niveau du manomètre: ✓
Distance après : 2D	Coef : 0.4684	Distance P-T°-B : ✓	Zéro du manomètre: ✓

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										534.62								
14h45	1	1	5	0.15	1.72	1306	79	79 →		538.31	13.4	5.7	2	-2.0	—	270		
		1		0.15	1.72	1300	82	82		541.83								
		2		0.15	1.72	1300	83	83		545.49						270		
		2		0.18	2.00	1348	84	84		549.01	14.0	5.4	2					
		3		0.18	2.00	1348	84	84		553.11								
		3		0.18	2.00	1349	85	85		557.22	14.0	5.4	2	-2.0		270		
		4		0.18	2.00	1354	86	86		561.31	14.0	5.3	2					
		4		0.18	2.00	1346	88	88		565.42								
		5		0.18	2.00	1348	88	88		569.51	13.9	5.4						
		5		0.18	2.00	1350	85	85		573.61								
		6		0.18	2.00	1361	85	85		577.68								
		6		0.18	2.00	1362	89	89		581.77								
		6		0.19	2.28	1364	92	92		586.08								
		6		0.19	2.28	1352	92	92		590.50	14.3	5.1				270		
		5		0.19	2.20	1356	94	94		595.00								
		5		0.19	2.20	1348	95	94		599.50	14.2	5.1						
		4		0.19	2.20	1352	95	95		604.03								
		4		0.19	2.20	1352	96	96		608.50								
		3		0.18	2.11	1355	97	97		613.00								
		3		0.18	2.11	1355	97	97		617.49	14.3	5.1						
		2		0.15	1.78	1337	98	98		621.69								
		2		0.15	1.82	1295	98	98		625.82								
		1		0.13	1.54	1337	99	99		629.70								
		1	↓	0.13	1.54	1345	99	99		633.54				-2.0				

TDF Initial Débit (pi^3/min): < 0.01 Pression (inhg) : -15" Hg Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

TDF Final Débit (pi^3/min): < 0.01 Pression (inhg) : -12" Hg Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

Fuite Pitot (ΔP) : ✓

REMARQUES O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

ΔP → 0.17 1340
ΔP_x → 0.19
ΔP_n → 0.13

TECHNICIEN :

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT | F_12_V9 (1/2) | CODE D'ESSAI : ME, EI | August/2018

Décontamination avant essai et détermination de l'humidité recueillie - USEPA 29

Compagnie: AE - Meliadine		Projet: 5528	
Source: Incinérateur		Essai: MEEI	# Cold Box: ME-1
Échantillonnée le: 22.09.2018	Date de l'assemblage : 21.09.2018		Heure:

DÉCONTAMINATION AVANT ESSAI DE LA BUSE ET DE LA SONDE

Item	Remarques	Brosser acétone	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
Buse et liner de verre		✓	✓	✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :				OUI	NON

DÉCONTAMINATION AVANT ESSAI DU TRAIN

Item	Remarques	Brosser acétone (si nécessaire)	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
du by-pass au barboteur 6			✓	✓	✓
Vérification du train d'échantillonnage à conserver :				OUI	NON

Remarques :

VOLUME D'EAU RECUEILLI (g)

ITEM #	PIÈCES	CONTENU	POIDS		
			APRÈS	AVANT	TOTAL
1	Barboteur 1 - GS mod	~~VIDE (optionnel) OU~~ CMM H_2O déminéralisée (100 ml)	682.1	599.7	
2	Barboteur 2 - GS mod	HNO_3 5% / H_2O_2 10% (100 ml)	722.2	693.0	
3	Barboteur 3 - GS	HNO_3 5% / H_2O_2 10% (100 ml)	567.3	562.3	
4	Barboteur 4 - GS mod	VIDE ✓	517.1	517.7	
5	Barboteur 5 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium	613.0	613.4	
6	Barboteur 6 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium	791.5	792.2	
7	Contenant de dessicant	GEL DE SILICE	1766.2	1747.8	133.3
TOTAL			5659.4	5526.1	

PARTICULES TOTALES (g)

# FILTRE QUARTZ	POIDS (g)	REMARQUES
QZR-4223		

LOTS DES PRODUITS UTILISÉS

Produits	# LOT
Acétone ~~ACS~~ optima	153394
Solution d'acide nitrique (HNO_3) 10%	A.148
Solution d'acide nitrique (HNO_3) 0.1 N	A.148
Solution d'acide sulfurique (H_2SO_4) 10%	A.136
Solution d'acide chlorhydrique (HCl) 8N	A.095
Permanganate de potassium ($KMnO_4$)	A.1017
Solution H_2O_2 10% / HNO_3 5%	A.148 / R-387

Remarques:

Technicien :

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT F_12_V9 (2/2) August/2018

Récupération finale du dispositif de prélèvement MÉTAUX USEPA 29

Date de récupération : 23.09.2018		Heure de récupération: 8h00	
Pesée des barboteurs pour l'humidité:	✓	Nettoyage de l'extérieur des différentes pièces :	✓
Conditionnement des contenants de récupération :	✓		

Contenant 1 - Récupération du filtre (Séparateur principal)

Mettre le filtre dans un pétri propre et scellé (pince en polyéthylène ou teflon)	✓

Contenants 2 et 3 - Récupération de la buse et de la sonde

Items	Remarques	Brosser 100 ml Acétone	Rincer 100 ml HNO_3 0,1N	Niveau
de la buse à la partie avant du porte-filtre		✓	✓	✓

Contenant 4 - Récupération de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3)

Items	Remarques	Rincer 100 mL HNO_3 0.1N	Niveau	Volume (mL)
de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3)	BB 1234	✓	✓	334

Contenant 5 - Récupération barboteurs 4 seul

Items	Remarques	Rincer 100 ml HNO_3 0.1N	Niveau	Volume (mL)
barboteur 4	Avec 123	✓	✓	✓

Contenant 6 - Récupération barboteurs 5 et 6 ($KMnO_4$)

Items	Remarques	Rincer 100 ml $KMnO_4/H_2SO_4$	Rincer 100 ml eau	Niveau	Volume (mL)
du barboteur 5 au barboteur 6 (pot de verre ambré)		✓	✓	✓	390

Contenant 7 - Récupération barboteurs 5 et 6 ($KMnO_4$) avec HCl 8N

Items	Remarques	200 mL H_2O dans bouteille récup. Rincer 25 mL HCl 8N	Niveau	Volume (mL)
du barboteur 5 au barboteur 6		✓	✓	225

Remarques:

BB1 → HCl 180 cc

BB4 → Rincé avec BB 123 parce qu'il était vide après les tests

Blancs :

100 mL Acétone	
300 mL 0.1 N HNO_3	
100 mL H_2O	
200 mL Solution H_2O_2 10% / HNO_3 5%	
100 mL KMnO4 4% / H2SO4 10%	
200 mL H_2O + 25 mL HCL 8N	
Filtre Quartz (x3)	

Pour la demande d'analyse, voici les échantillons:
1a- Métaux sur contenants 1 + 2 + 3
1b- Hg sur contenants 1 + 2 + 3
2a- Métaux sur contenant 4
2b- Hg sur contenant 4
3a- Hg sur contenant 5
3b- Hg sur contenant 6
3c- Hg sur contenant 7

Technicien :

Consulair
Échantillonnage de l'air
Conformité environnementale

Formulaire: F_11_V4 **janvier-2014**

Laboratoire - Décontamination initiale des ensembles de verrerie - MÉTAUX USEPA 29

Compagnie:	Projet:	# du Cold box : ME-1
Source:	Essai:	# du filtre :
Échantillonnée le:	Date décontamination:	Heure:

Décontamination			Rinçage Eau	Eau + Savon	Eau	Rincer H_2O démin. 4h	Tremper HNO_3 10%	Rincer H_2O démin.	Rincer Acétone
Item (dans l'ordre)		**Remarques**	**1 x**	**1 x**	**3 x**	**3 x**	**4 hres**	**3 x**	**3 x**
By pass			✓	✓	✓	✓	✓		
Cyclone (si applicable)									
Erlenmeyer (si applicable)									
Cloche femelle									
Support à filtre en téflon									
Cloche mâle									
Coude (bas cloche - barb.)									
Barboteur 1 +1			✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓	✓
Barboteur 2			✓	✓	✓	✓	✓	✓	✓
Barboteur 3			✓	✓	✓	✓	✓	✓	✓
Barboteur 4 (si applicable)			✓	✓	✓	✓	✓	✓	✓
Barboteur 5 (si Hg)			✓	✓	✓	✓	✓	✓	✓
Barboteur 6 (si Hg)			✓	✓	✓	✓	✓	✓	✓
Coudes (5 ou ....)			✓	✓	✓	✓	✓	✓	✓
Liner de verre							Rincer		+ Brosser

Vérification initiale de la verrerie et du liner du train d'échantillonnage et conserver le dernier rinçage à l'acétone si nécessaire.

Buse de verre									+ Brosser

Vérification initiale de la buse, conserver le dernier rinçage à l'acétone si nécessaire.

N.B. Joint d'étanchéité en téflon

Commentaires:

Décontaminé par: ID Date: 04/09/2015 Endroit: Qc

Consulair Formulaire: F_11_V4 janvier-2014

Échantillonnage de l'air
Conformité environnementale

Laboratoire - Décontamination initiale des ensembles de verrerie - MÉTAUX USEPA 29

Compagnie:	Projet:	# du Cold box :
Source:	Essai:	# du filtre :
Échantillonnée le:	Date décontamination:	Heure:

Décontamination			Rinçage Eau	Eau + Savon	Eau	Rincer H_2O démin.	8:11h20 Tremper HNO_3 10%	Rincer H_2O démin.	Rincer Acétone
Item (dans l'ordre)		**Remarques**	**1 x**	**1 x**	**3 x**	**3 x**	**4 hres**	**3 x**	**3 x**
By pass			✓	✓	✓	✓	✓	✓	✓
Cyclone (si applicable)									
Erlenmeyer (si applicable)									
Cloche femelle			✓	✓	✓	✓	✓	✓	✓
Support à filtre en téflon			✓	✓	✓	✓	✓	✓	✓
Cloche mâle			✓	✓	✓	✓	✓	✓	✓
Coude (bas cloche - barb.)									
Barboteur 1									
Barboteur 2									
Barboteur 3									
Barboteur 4 (si applicable)									
Barboteur 5 (si Hg)									
Barboteur 6 (si Hg)									
Coudes (5 ou ….)									
Liner de verre							Rincer		+ Brosser

Vérification initiale de la verrerie et du liner du train d'échantillonnage et conserver le dernier rinçage à l'acétone si nécessaire.

Buse de verre									+ Brosser

Vérification initiale de la buse, conserver le dernier rinçage à l'acétone si nécessaire.

N.B. Joint d'étanchéité en téflon

Commentaires:

Décontaminé par: [signature] Date: 04/09/2018 Endroit: QC

P1

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : ME - E2

February/2017

Usine : AE Meliadine	Date : 23.09.2018	P. Bar (po Hg) :		# Cold box :	ME-1
Ville: Rankin Inlet		P. Stat. (po H_2O) :	-0.01		
ID point d'émission : Incinérateur	Sonde N° : 05.07 (SQ.501)	Module N° : 25	NC	K' :	28.82
Diamètre : 32½"	Cp : 0.724	Kc :	0.999		
Distance avant : 50	Buse N° : SQ-434	Ko :	0.733	Niveau du manomètre:	—
Distance après : 20	Coef : 0.4366	Distance P-T°-B :	—	Zéro du manomètre:	—

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										636.82								
1434	1	1	5	0.15	1.31	1290	72	71		640.06	14.4	4.9	3	-2.0	—	260	—	40
		1		0.15	1.28	1341	72	72		643.21								
		1		0.15	1.28	1349	73	73		646.52								
		2		0.14	1.19	1352	74	74		649.71								
		2		0.14	1.19	1354	76	76		652.87	14.6	4.7						
		2		0.14	1.19	1354	78	78		656.06					—	272	—	
		3		0.13	1.13	1344	80	80		659.14	14.7	4.7						
		3		0.13	1.13	1340	82	82		662.29								
		3		0.13	1.12	1348	83	83		665.39	14.5	4.9	3					
		4		0.13	1.12	1347	85	85		668.50								
		4		0.13	1.12	1345	86	86		671.62	14.5	4.9						
		4		0.13	1.14	1348	88	88		674.77								
		5		0.13	1.15	1334	89	89		677.84	15.2	4.4						
		5		0.13	1.11	1320	91	91		680.96								
		5		0.13	1.15	1337	92	92		684.09	15.1	4.4	4					
		6		0.12	1.06	1334	93	93		687.13								
		6		0.12	1.06	1335	94	94		690.18	15.3	4.3	4	-3.0	—	270		40
		6		0.12	1.06	1340	95	95		693.21								

TDF Initial Débit (pi^3/min): 0.01 Pression (inhg) : 15"Hg Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3): Fuite Pitot (ΔP) :

TDF Final Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

REMARQUES O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN :

P2

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : ME-ÉD

February/2017

Usine :	Date :	P. Bar (po Hg) :	# Cold box :
Ville:		P. Stat. (po H_2O) :	
ID point d'émission :	Sonde N° :	Module N° :	K' :
Diamètre :	Cp :	Kc :	
Distance avant :	Buse N° :	Ko :	Niveau du manomètre:
Distance après :	Coef :	Distance P-T°-B :	Zéro du manomètre:

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										693.21								
	2	6	5	0.12	1.07	1338	96	96		696.26	15.3	4.3	4	-3.0		273	40	
		6		0.12	1.07	1338	97	97		699.31								
		6		0.12	1.08	1328	97	97		702.37	15.3	4.3	4					
		5		0.12	1.08	1344	98	98		705.44								
		5		0.12	1.08	1344	98	98		708.51						271	40	
		5		0.12	1.08	1341	99	99		711.60	15.3	4.3	4					
		4		0.12	1.08	1342	99	99		714.66								
		4		0.10	0.90	1329	100	100		717.50								
		4		0.10	0.90	1326	100	100		720.31								
		3		0.10	0.90	1326	100	101		723.10								
		3		0.10	0.90	1330	102	102		725.88	15.3	4.0						
		3		0.10	0.90	1330	102	102		728.68								
		2		0.10	0.90	1326	103	103		731.49								
		2		0.10	0.90	1316	104	104		734.29	15.3	4.4						
		2		0.10	0.90	1317	104	104		737.13								
		1		0.10	0.90	1311	105	105		740.0								
		1																
		1																

TDF Initial Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	Fuite Pitot (ΔP) :
TDF Final Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

Arrêt procédé (180 min - 15 min)

TECHNICIEN :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_12_V9 (1/2) CODE D'ESSAI: ME-2 August/2018

Décontamination avant essai et détermination de l'humidité recueillie - USEPA 29

Compagnie: AEM - Mul		Projet: 18-5528	
Source: incinerateur		Essai: 2	# Cold Box: ME-1
Échantillonnée le: 28-09-2018	Date de l'assemblage : 18-09-26		Heure: 10h30

DÉCONTAMINATION AVANT ESSAI DE LA BUSE ET DE LA SONDE

Item	Remarques	Brosser acétone	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
Buse et liner de verre		✓	✓	✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :				OUI	NON

DÉCONTAMINATION AVANT ESSAI DU TRAIN

Item	Remarques	Brosser acétone (si nécessaire)	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
du by-pass au barboteur 6		✓	✓	✓	✓
Vérification du train d'échantillonnage à conserver :				OUI	NON

Remarques :

VOLUME D'EAU RECUEILLI (g)

ITEM #	PIÈCES	CONTENU	POIDS		
			APRÈS	AVANT	TOTAL
1	Barboteur 1 - GS mod	~~VIDE (optionnel) OU~~ CMM H_2O déminéralisée (100 ml)	682.6	609.7	
2	Barboteur 2 - GS mod	HNO_3 5% / H_2O_2 10% (100 ml)	702.5	684.9	
3	Barboteur 3 - GS	HNO_3 5% / H_2O_2 10% (100 ml)	573.5	565.5	
4	Barboteur 4 - GS mod	VIDE	520.4	520.8	
5	Barboteur 5 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium	611.7	612.2	
6	Barboteur 6 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium	781.4	783.3	
7	Contenant de dessicant	GEL DE SILICE	1782.6	1761.7	121.6
TOTAL					

PARTICULES TOTALES (g)

# FILTRE QUARTZ	POIDS (g)	REMARQUES

LOTS DES PRODUITS UTILISÉS

Produits	# LOT
Acétone ACS	
Solution d'acide nitrique (HNO_3) 10%	
Solution d'acide nitrique (HNO_3) 0.1 N	
Solution d'acide sulfurique (H_2SO_4) 10%	
Solution d'acide chlorhydrique (HCl) 8N	
Permanganate de potassium ($KMnO_4$)	
Solution H_2O_2 10% / HNO_3 5%	

Remarques:

Technicien :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_12_V9 (2/2)

August/2018

Récupération finale du dispositif de prélèvement MÉTAUX USEPA 29

Date de récupération : 29-09-2018		Heure de récupération:	8h00
Pesée des barboteurs pour l'humidité:	✓	Nettoyage de l'extérieur des différentes pièces :	✓
Conditionnement des contenants de récupération :	✓		

Contenant 1 - Récupération du filtre (Séparateur principal)

Mettre le filtre dans un pétri propre et scellé (pince en polyéthylène ou teflon)	✓

Contenants 2 et 3 - Récupération de la buse et de la sonde

Items	Remarques	Brosser 100 ml Acétone	Rincer 100 ml HNO_3 0,1N	Niveau
de la buse à la partie avant du porte-filtre		✓	✓	✓

Contenant 4 - Récupération de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3)

Items	Remarques	Rincer 100 mL HNO_3 0.1N	Niveau	Volume (mL)
de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3) +4		✓	✓	323

Contenant 5 - Récupération barboteurs 4 seul

Items	Remarques	Rincer 100 ml HNO_3 0.1N	Niveau	Volume (mL)
~~barboteur 4~~	Avec BB123			

Contenant 6 - Récupération barboteurs 5 et 6 ($KMnO_4$)

Items	Remarques	Rincer 100 ml $KMnO_4/H_2SO_4$	Rincer 100 ml eau	Niveau	Volume (mL)
du barboteur 5 au barboteur 6 (pot de verre ambré)		✓	✓	✓	400

Contenant 7 - Récupération barboteurs 5 et 6 ($KMnO_4$) avec HCl 8N

Items	Remarques	200 mL H_2O dans bouteille récup. Rincer 25 mL HCl 8N	Niveau	Volume (mL)
du barboteur 5 au barboteur 6		✓	✓	225

Remarques:

BB1 → HCl → 188cc

BB4 → Vide Rincer Avec BB123

Blancs :

100 mL Acétone	
300 mL 0.1 N HNO_3	
100 mL H_2O	
200 mL Solution H_2O_2 10% / HNO_3 5%	
100 mL KMnO4 4% / H2SO4 10%	
200 mL H_2O + 25 mL HCL 8N	
Filtre Quartz (x3)	

Pour la demande d'analyse, voici les échantillons:
1a- Métaux sur contenants 1 + 2 + 3
1b- Hg sur contenants 1 + 2 + 3
2a- Métaux sur contenant 4
2b- Hg sur contenant 4
3a- Hg sur contenant 5
3b- Hg sur contenant 6
3c- Hg sur contenant 7

Technicien :

P1

ONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : ME - E3

février-2017

Usine : AE Meliadine	Date : 25-09-2018	P. Bar (po Hg) :		# Cold box :	ME.1
Ville: Rankin Inlet		P. Stat. (po H_2O) :			
ID point d'émission : Incinérateur	Sonde N° : 05-07 Q 501	Module N° :	85 NC	K' :	28,82
Diamètre : 32.5"	Cp : 0.774	Kc :	0.999		
Distance avant : 5D	Buse N° : SQ. 434	Ko :	0,733	Niveau du manomètre:	✓
Distance après : 2D	Coef : 0.4366	Distance P-T°-B :	✓	Zéro du manomètre:	✓

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										747.13								
1644	1	1	5	0.20	1.68	1327	78	78	*	750.81	12.9	6.0	3	-3.0	—	250	50	—
		1		0.20	1.72	1347	79	79		754.60								
		1		0.20	1.72	1350	80	80		758.43	13.0	6.0	3					
		2		0.20	1.71	1360	81	81		762.18								
		2		0.20	1.70	1374	81	81		765.96	12.8	6.1						
		2		0.20	1.70	1378	82	82		769.75								
		3		0.22	1.87	1380	83	83		773.68								
		3		0.23	1.95	1393	84	84		777.76	13.7	5.5				248		
		3		0.23	1.94	1401	85	85		781.26								
		4		0.23	1.94	1410	85	85		785.75								
		4		0.23	1.92	1420	86	86		789.72	13.7	5.5	3					
		4		0.23	1.93	1423	87	87		793.77								
		5		0.23	1.92	1431	88	88		797.79								
		5		0.20	1.68	1418	89	89		801.59								
		5		0.20	1.68	1430	90	90		805.38	14.5	5.2						
		6		0.20	1.69	1418	90	90		809.19	14.2	5.1						
		6		0.20	1.67	1440	90	90		813.00				-4.0		270		
		6	15	0.20	1.67	1441	91	91		816.78								

TDF Initial Débit (pi^3/min): <0.01	Pression (inhg) :- 15" Hg	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	Fuite Pitot (ΔP) : ✓
TDF Final Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN :

P2

ME-E3

Formulaire: F_09_V5

Code d'essai :

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

février-2017

Usine :	Date :	P. Bar (po Hg) :	# Cold box :
Ville:		P. Stat. (po H_2O) :	
ID point d'émission :	Sonde N° :	Module N° :	K' :
Diamètre :	Cp :	Kc :	
Distance avant :	Buse N° :	Ko :	Niveau du manomètre:
Distance après :	Coef :	Distance P-T°-B :	Zéro du manomètre:

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										816.78								
	2	6	5	0.20	1.66	1451	91	91		820.57	4.1	5.2	3	-3.0		220	40	
		6		0.20	1.66	1460	92	92		824.36								
		6		0.20	1.65	1467	93	93		828.17								
		5		0.19	1.57	1476	94	94		831.88	14.0	5.3	3					
		5		0.19	1.57	1479	95	95		835.60								
		5		0.19	1.57	1481	96	96		839.27								
		4		0.19	1.55	1502	97	97		842.94	12.9	6.2						
		4		0.21	1.72	1518	99	99		846.82								
		4		0.21	1.71	1518	99	99		850.70								
		3		0.21	1.71	1520	100	100		854.57								
		3		0.21	1.72	1518	101	101		858.43								
		3		0.21	1.71	1525	102	102		862.27								
		2		0.21	1.71	1522	103	103		866.14								
		2		0.17	1.39	1522	104	104		869.62								
		2		0.17	1.44	1460	105	105		873.16								
		1		0.17	1.46	1436	106	106		876.67								
		1		0.17	1.47	1439	106	106		880.21								
		1		0.17	1.48	1421	107	107		883.85								

TDF Initial Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	Fuite Pitot (ΔP) :
TDF Final Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	

REMARQUES O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN :

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT — F_12_V9 (1/2) — CODE D'ESSAI : ME-3 — August/2018

Décontamination avant essai et détermination de l'humidité recueillie - USEPA 29

Compagnie: AE Meliadine		Projet: ST28	
Source: Incinérateur		Essai: # 3	# Cold Box: ME-1
Échantillonnée le:	Date de l'assemblage : 28-09-2018		Heure: 7400

DÉCONTAMINATION AVANT ESSAI DE LA BUSE ET DE LA SONDE

Item	Remarques	Brosser acétone	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
Buse et liner de verre		✓	✓	✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :				OUI	NON

DÉCONTAMINATION AVANT ESSAI DU TRAIN

Item	Remarques	Brosser acétone (si nécessaire)	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
du by-pass au barboteur 6			✓	✓	✓
Vérification du train d'échantillonnage à conserver :				OUI	NON

Remarques :

VOLUME D'EAU RECUEILLI (g)

ITEM #	PIÈCES	CONTENU	POIDS		
			APRÈS	AVANT	TOTAL
1	Barboteur 1 - GS mod	VIDE (optionnel) OU CMM H_2O déminéralisée (100 ml)	740.1	604.4	
2	Barboteur 2 - GS mod	HNO_3 5% / H_2O_2 10% (100 ml)	711.9	684.0	
3	Barboteur 3 - GS	HNO_3 5% / H_2O_2 10% (100 ml)	575.8	570.9	
4	Barboteur 4 - GS mod	VIDE	519.6	518.9	
5	Barboteur 5 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium	623.3	624.0	
6	Barboteur 6 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium	773.1	774.0	
7	Contenant de dessicant	GEL DE SILICE	1801.7	1782.6	18.2
TOTAL					

PARTICULES TOTALES (g)

# FILTRE QUARTZ	POIDS (g)	REMARQUES

LOTS DES PRODUITS UTILISÉS

Produits	# LOT
Acétone ACS	
Solution d'acide nitrique (HNO_3) 10%	
Solution d'acide nitrique (HNO_3) 0.1 N	
Solution d'acide sulfurique (H_2SO_4) 10%	
Solution d'acide chlorhydrique (HCl) 8N	
Permanganate de potassium ($KMnO_4$)	
Solution H_2O_2 10% / HNO_3 5%	

Remarques:

Technicien :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_12_V9 (2/2)

August/2018

Récupération finale du dispositif de prélèvement MÉTAUX USEPA 29

Date de récupération :	30 9 2018	Heure de récupération:	9h15
Pesée des barboteurs pour l'humidité:	✓	Nettoyage de l'extérieur des différentes pièces :	✓
Conditionnement des contenants de récupération :	✓		

Contenant 1 - Récupération du filtre (Séparateur principal)

Mettre le filtre dans un pétri propre et scellé (pince en polyéthylène ou teflon)	✓

Contenants 2 et 3 - Récupération de la buse et de la sonde

Items	Remarques	Brosser 100 ml Acétone	Rincer 100 ml HNO_3 0,1N	Niveau
de la buse à la partie avant du porte-filtre		✓	✓	✓

Contenant 4 - Récupération de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3)

Items	Remarques	Rincer 100 mL HNO_3 0.1N	Niveau	Volume (mL)
de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3)	230+100	✓		330

Contenant 5 - Récupération barboteurs 4 seul

Items	Remarques	Rincer 100 ml HNO_3 0.1N	Niveau	Volume (mL)
barboteur 4	Avec BB 123	—	—	—

Contenant 6 - Récupération barboteurs 5 et 6 ($KMnO_4$)

Items	Remarques	Rincer 100 ml $KMnO_4/H_2SO_4$	Rincer 100 ml eau	Niveau	Volume (mL)
du barboteur 5 au barboteur 6 (pot de verre ambré)		✓	✓	✓	400

Contenant 7 - Récupération barboteurs 5 et 6 ($KMnO_4$) avec HCl 8N

Items	Remarques	200 mL H_2O dans bouteille récup. Rincer 25 mL HCl 8N	Niveau	Volume (mL)
du barboteur 5 au barboteur 6		✓	✓	225

Remarques:

BB 1 → HCl → 240 mL

BB4 avec BB 123

Blancs :

100 mL Acétone	
300 mL 0.1 N HNO_3	
100 mL H_2O	
200 mL Solution H_2O_2 10% / HNO_3 5%	
100 mL KMnO4 4% / H2SO4 10%	
200 mL H_2O + 25 mL HCL 8N	
Filtre Quartz (x3)	

Pour la demande d'analyse, voici les échantillons:
1a- Métaux sur contenants 1 + 2 + 3
1b- Hg sur contenants 1 + 2 + 3
2a- Métaux sur contenant 4
2b- Hg sur contenant 4
3a- Hg sur contenant 5
3b- Hg sur contenant 6
3c- Hg sur contenant 7

Technicien :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_12_V9 (1/2) CODE D'ESSAI : ME-~~BL~~ blanc August/2018

Décontamination avant essai et détermination de l'humidité recueillie - USEPA 29

Compagnie: AECI - Mel		Projet: 18-5528	
Source: Incinérateur		Essai: BL	# Cold Box: ME-1
Échantillonnée le: 2018-09-23	Date de l'assemblage : 18-09-23		Heure: 9h00

DÉCONTAMINATION AVANT ESSAI DE LA BUSE ET DE LA SONDE

Item	Remarques	Brosser acétone	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
Buse et liner de verre			✓	✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :				OUI	NON

DÉCONTAMINATION AVANT ESSAI DU TRAIN

Item	Remarques	Brosser acétone (si nécessaire)	Rincer 3x HNO_3 10%	Rincer 3x H_2O démin.	Rincer 3x Acétone
du by-pass au barboteur 6			✓	✓	✓
Vérification du train d'échantillonnage à conserver :				OUI	NON

Remarques :

VOLUME D'EAU RECUEILLI (g)

ITEM #	PIÈCES	CONTENU	POIDS		
			APRÈS	AVANT	TOTAL
1	Barboteur 1 - GS mod	VIDE (optionnel) OU CMM H_2O déminéralisée (100 ml)		603.0	
2	Barboteur 2 - GS mod	HNO_3 5% / H_2O_2 10% (100 ml)		705.1	
3	Barboteur 3 - GS	HNO_3 5% / H_2O_2 10% (100 ml)		560.1	
4	Barboteur 4 - GS mod	VIDE		519.2	
5	Barboteur 5 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium		620.4	
6	Barboteur 6 - GS mod	$KMnO_4$ 4% / H_2SO_4 10% (100 ml) recouvert d'aluminium		764.1	
7	Contenant de dessicant	GEL DE SILICE		766.7	
TOTAL					

PARTICULES TOTALES (g)

# FILTRE QUARTZ	POIDS (g)	REMARQUES

LOTS DES PRODUITS UTILISÉS

Produits	# LOT
Acétone ~~ACS~~ optima	153 794
Solution d'acide nitrique (HNO_3) 10%	A-148
Solution d'acide nitrique (HNO_3) 0.1 N	A-148
Solution d'acide sulfurique (H_2SO_4) 10%	A-136
Solution d'acide chlorhydrique (HCl) 8N	A-095
Permanganate de potassium ($KMnO_4$)	A1017
Solution H_2O_2 10% / HNO_3 5%	

Remarques:

Technicien :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_12_V9 (2/2)

August/2018

Récupération finale du dispositif de prélèvement MÉTAUX USEPA 29

Date de récupération : 24.09.2018		Heure de récupération: 10h00	
Pesée des barboteurs pour l'humidité:	✓	Nettoyage de l'extérieur des différentes pièces :	✓
Conditionnement des contenants de récupération :	✓		

Contenant 1 - Récupération du filtre (Séparateur principal)

Mettre le filtre dans un pétri propre et scellé (pince en polyéthylène ou teflon)	✓

Contenants 2 et 3 - Récupération de la buse et de la sonde

Items	Remarques	Brosser 100 ml Acétone	Rincer 100 ml HNO_3 0,1N	Niveau
de la buse à la partie avant du porte-filtre		✓	✓	✓

Contenant 4 - Récupération de la partie arrière du porte-filtre aux barboteurs métaux (Barb. 1-2 & 3)

Items	Remarques	Rincer 100 mL HNO_3 0.1N	Niveau	Volume (mL)
de la partie arrière du porte-filtre aux barboteurs métaux (Barb. ~~1~~2 & 3)		✓	✓	≃ 300

Contenant 5 - Récupération barboteurs 4 seul

Items	Remarques	Rincer 100 ml HNO_3 0.1N	Niveau	Volume (mL)
barboteur 4	Avec 123			

Contenant 6 - Récupération barboteurs 5 et 6 ($KMnO_4$)

Items	Remarques	Rincer 100 ml $KMnO_4/H_2SO_4$	Rincer 100 ml eau	Niveau	Volume (mL)
du barboteur 5 au barboteur 6 (pot de verre ambré)		✓	✓	✓	400

Contenant 7 - Récupération barboteurs 5 et 6 ($KMnO_4$) avec HCl 8N

Items	Remarques	200 mL H_2O dans bouteille récup. Rincer 25 mL HCl 8N	Niveau	Volume (mL)
du barboteur 5 au barboteur 6		✓	✓	225

Remarques: BB1-HCl → 100 cc

BB4- Rincer avec BB 123

Blancs :

100 mL Acétone	✓
300 mL 0.1 N HNO_3	✓
100 mL H_2O	✓
200 mL Solution H_2O_2 10% / HNO_3 5%	✓
100 mL KMnO4 4% / H2SO4 10%	✓
200 mL H_2O + 25 mL HCL 8N	✓
Filtre Quartz (x3)	

Pour la demande d'analyse, voici les échantillons:
1a- Métaux sur contenants 1 + 2 + 3
1b- Hg sur contenants 1 + 2 + 3
2a- Métaux sur contenant 4
2b- Hg sur contenant 4
3a- Hg sur contenant 5
3b- Hg sur contenant 6
3c- Hg sur contenant 7

Technicien :

P1-

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : COSU-E1

February/2017

Usine : AE Meliadine	Date : 22.09.2018	P. Bar (po Hg) :		# Cold box :	OR-2/U1
Ville: Rankin Inlet		P. Stat. (po H_2O) :	−0.06		
ID point d'émission : Incinerateur	Sonde N° : 03.06 (371)	Module N° :	19 COMP	K' :	26.18
Diamètre : 32.5	Cp : 0.78	Kc :	0.997		
Distance avant : 5D	Buse N° : 371	Ko :	1.000	Niveau du manomètre :	✓
Distance après : 2D	Coef : 0.(3741)	Distance P-T°-B :	✓	Zéro du manomètre :	✓

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi³) 483.64	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
13h44	/	/	5	0.18	0.45	1330	60	60	76	485.51	13.4	5.3	3	-1.0	—	250	—	37
		/		0.17	0.43	1345			77	488.0								
		/		0.17	0.43	1345			77	490.46	13.4	5.6	3	-1.0				
		/		0.17	0.43	1345			77	492.92	13.4	5.7	3			250		36
		2		0.17	0.43	1352			78	495.48	13.4	5.7	3					
		2		0.17	0.43	1356			79	497.85	13.5	5.7	2					
		2		0.18	0.41	1354			80	500.35	13.5	5.7	2			250		36
		2		0.18	0.41	1353			80	502.87	13.5	5.7	2	-1.0				
		3		0.18	0.41	1361			82	505.38	13.5	5.7	2			250		36
		3		0.21	0.53	1366			82	508.08	13.5	5.7	2	-1.0				
		3		0.21	0.53	1381			84	510.29	13.4	5.8	2					39.
		3		0.21	0.53	1377			83	513.50	13.4	5.7	2	-1.5				
14h44	AE	4		0.21	0.53	1379			84	516.20	13.4	5.7	2					
		4		0.21	0.53	1380			85	518.83	13.5	5.7	2					
		4		0.21	0.53	1373			85	521.61	13.7	5.6		-1.5		250		39
		4		0.21	0.53	1323			85	524.28	13.9	5.4						
		5		0.18	0.41	1341			87	526.78	13.5	5.4						39
		5		0.18	0.41	1348			87	529.27	14.0	5.3		-1.5		250		
		5		0.18	0.41	1350			88	531.86	14.0	5.3						
				0.18	0.41	1354			88	534.26	14.0	5.4						
		6		0.18	0.41	1355			88	536.79	14.0	5.3	2					
		6		0.18	0.41	1359			90	539.34	14.0	5.3	2					
		6		0.18	0.41	1361			90	541.87	14.0	5.3	2					
		6	D	0.17	0.41	1350	D	D	90	544.36	14.0	5.3						

TDF Initial Débit (pi³/min): 0.015 — Pression (inhg) : ~15" Hg — Volume ini (pi³): — Volume fin (pi³): — Volume (pi³): — Fuite Pitot (ΔP) : ✓

TDF Final Débit (pi³/min): — Pression (inhg) : — Volume ini (pi³): — Volume fin (pi³): — Volume (pi³):

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

$\overline{\Delta P} = 0.16$ $\Delta P_{min} = 0.1$

$_{MAX}\Delta P = 0.21$

TECHNICIEN :

P2

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : COSU- E1

February/2017

Usine :	Date :	P. Bar (po Hg) :	# Cold box :
Ville:		P. Stat. (po H_2O) :	
ID point d'émission :	Sonde N° :	Module N° :	K' :
Diamètre :	Cp :	Kc :	
Distance avant :	Buse N° :	Ko :	Niveau du manomètre:
Distance après :	Coef :	Distance P-T°-B :	Zéro du manomètre:

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										544.36								
		6	5	0.15	0.38	1357	60	60	93	546.67						250		
		6		0.16	0.41	1350			93	549.00	14.3	5.1						
		6		0.16	0.41	1355			94	551.26								
		6		0.16	0.41	1352			94	553.57	14.3	5.1						
		5		0.16	0.41	1348			97	555.93								
		5		0.16	0.41	1350			97	558.42								
		5		0.16	0.41	1330			97	560.77	14.3	5.1						
		5		0.15	0.39	1340			98	563.08								
		4		0.15	0.39	1332			99	565.37								
		4		0.13	0.35	1280			100	567.67								
		4		0.13	0.35	1300			100	569.98	14.9	4.7						
		4		0.11	0.29	1306			101	572.08								
		3		0.11	0.29	1304			101	574.08	14.8	4.8						38
		3		0.11	0.29	1280			102	576.10								
		3		0.11	0.29	1250			102	578.09								
		3		0.11	0.29	1266			103	580.17	14.9	4.6	3					
		2		0.13	0.35	1318			103	582.40								
		2		0.13	0.35	1320			103	584.62								
		2		0.13	0.35	1324			103	586.87	14.4	5.0						
		2		0.13	0.35	1310			102	589.10								
		1		0.13	0.35	1317			102	591.32	14.5	5.0						
				0.13	0.35	1322			102	593.56								
				0.13	0.35	1318			102	595.76								
		1		0.13	0.35	1326			102	598.00								

TDF Initial Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3): Fuite Pitot (ΔP) :

TDF Final Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN :

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT	F_07_V5 (1/2) 2018	Avril	CODE DE L'ESSAI : MEL COSU - E1

Vérification avant essai et montage du dispositif de prélèvement - COSV (SPE 1/RM/2)

Compagnie: AE Meliadine	Projet: 5528	# Ensemble de verrerie : 28
Source: incinerateur	Essai: #1	# Hot Box : OR.2 / V1
Date : 22-09-2018		Heure : 17h00

1 - DÉCONTAMINATION & VÉRIFICATION AVANT ESSAI - BUSE ET SONDE

Item	Remarques	Brosse - DHA	HA
		3x Ch.	3x Ch.
Buse et sonde		✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :		OUI	NON

2 - VÉRIFICATION AVANT ESSAI - TRAIN

Item	Remarques	HA	
		3x Ch.	
Train		✓	
Vérification de la verrerie du train d'échantillonnage à conserver :		OUI	NON

3 - VOLUME D'EAU RECUEILLIE

ITEM #	PIÈCE	CONTENU	POIDS (g)		
			APRÈS	AVANT	TOTAL
1	Condenseur (réfrigérant)	VIDE			
2	Trappe de résine *	XAD-2 #4781	401.1	382.8	
3	Trappe à condensat	VIDE	502.9	365.3	
4	Barboteur Greenburg-Smith	ÉTHYLÈNE GLYCOL (100-~~150~~ ~~mL~~)	599.7	586.7	
5	Barboteur modifié	VIDE	446.7	446.70	
6	Contenant de dessicant	GEL DE SILICE	1713.9	1708.0	174.8
			3664.3	3488.5 TOTAL	

* : Recouvrir de papier d'aluminium après la pré-pesée, et retirer avant la pesée après essai.

REMARQUES :

4 - LOTS DES SOLVANTS UTILISÉS

SOLVANTS	# LOT
Dichlorométhane (grade optima)	
Hexane (grade optima)	156309
Acétone (grade optima)	153394
Éthylène glycol	142823
Eau HPLC	135150
Résine XAD-2	

Vérifié par:	Date:	Endroit:

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_07_V5 (2/2)
Avril 2018

Récupération finale du dispositif de prélèvement - COSV (SPE 1/RM/2)

Date de récupération : 2018-09-23	Heure de récupération:	
Nettoyage de l'extérieur des différentes pièces : ✓	√	
Conditionnement (HA) des contenants **(verre ambré)** de récupération :	✓ √	

Contenant 1 - Buse-Sonde

Item	Remarques	Brosse HA	HA 3x Ch.	Niveau
Buse et Sonde		✓	✓	✓

Contenant 2 - Filtre

Filtre	Pétri scellé avec ruban de teflon - dans le papier d'aluminium	✓ √

Contenant 3 - Récupération de la partie arrière du Porte-filtre au Condenseur (avant trappe)

Item	Remarques	Tremp. H-A 5 min. Ch	HA 3x Ch.	Niveau
Avant trappe résine		✓	✓	✓

Contenant 4 - Récupération de la Trappe de résine XAD-2

Trappe de résine XAD-2	Sceller avec ruban de teflon - enveloppé papier d'aluminium	√ ✓

Contenant 5 - Récupération de la Trappe à condensat au 1er Barboteur (eau)

Item (dans l'ordre)	Remarques	H_2O HPLC 3x	Niveau
Eau		✓	✓

Contenant 6 - Rinçage final de la partie arrière du Porte-filtre au dernier Barboteur

Item	Remarques	HA 3x Ch.	Niveau
Rinçage final		✓	✓

Les pots doivent être en verre ambré.

Remarques

Blancs:

Blanc de terrain (1x pour chaque 3 essais) - Faire aspirer volume d'air équivalent à tous les tests de fuite	
Résine XAD-2 (environ 40g, 1 tube)	
Eau HPLC	
Éthylène Glycol	
Acétone	
Hexane	

Récupération par :	Date :	Endroit :

CONSULAIR

Train d'échantillonnage - ORGANIQUES

Compagnie: AE Meliodive		Projet: 5528	
Échantillonné le: 22.05.2018		Récupéré par:	
Source: Incinérateur	Essai: #1	Date: 21.08.2018	Heure:

CAISSE # 28

Item (dans l'ordre)	#	Nom de la pièce	Sol. RBS	Eau + Savon	Eau démin.	DHA	HA
		Décontamination			Ok		
By pass	OR-28-BP	By pass	✓	✓	✓	✓	✓
Cloche femelle	(N/A)	Cloche femelle	✓	✓	✓	✓	✓
Support à filtre en téflon	(N/A)	Support à filtre en téflon	✓	✓	✓	✓	✓
Cloche mâle	(N/A)	Cloche mâle	✓	✓	✓	✓	✓
Réfrigérant	ORC-28-R	Réfrigérant	✓	✓	✓	✓	✓
Trappe de résine		Trappe de résine					
Trappe à condensat verticale	OR-28TC	Trappe à condensat verticale	✓	✓	✓	✓	✓
Long coude		Tige AF pour Réfrigérant	✓	✓	✓	✓	✓
	OR-28-LC	Long coude	✓	✓	✓	✓	✓
Barbotteur Greenberg Smith	(N/A)	Barbotteur Greenberg Smith	✓	✓	✓	✓	✓
Coude	ORC-28-C	Coude	✓	✓	✓	✓	✓
Barbotteur Std	(N/A)	Barbotteur Std	✓	✓	✓	✓	✓
Bouteille de verre ambrée (1)		Bouteille de verre ambrée	✓	✓	✓		✓
Garnitures (Téflon + Aluminium)							
Nombre total de pièces	10	# Unique	1494				

Décontaminé par: JD	Date: 30/08/2018	Endroit: Québec
Code de décontamination (pot): JD-30/08/2018 - OR28		

Lot Des Solvants:
Dichlorométhane: 176773
Hexane: 175762
Acétone: 161822

Commentaires

Formulaire mis-à-jour le 2018-05-14

P1

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : COSU. E2

February/2017

Usine : AE Meliadine	Date : 28.09.2018	P. Bar (po Hg) :		# Cold box : OR2/V1	
Ville: Rankin Inlet		P. Stat. (po H_2O) : — 0.05			
ID point d'émission : Incinerateur	Sonde N° : 03.06 3Q.503	Module N° : 19 COMP		K' : 26.19	
Diamètre : 32½	Cp : 0.781	Kc : 0.997			
Distance avant : 5D	Buse N° : 3Q.503	Ko : 1.000		Niveau du manomètre: ✓	
Distance après : 2D	Coef : 0.4958	Distance P-T°-B : ✓		Zéro du manomètre: ✓	

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi³) 600	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
11:50	1	6	5	0.[illegible]	1.[illegible]	1275	60	60	72	604.57	14.5	4.6	3	-2.0	—	250		45
		6		0.15	1.[illegible]	1353			73	608.84								
		6		0.15	1.15	1360			73	612.97	14.5	4.9	3					
		5		0.15	1.15	1362			74	617.11								
		5		0.[illegible]	1.15	1369			75	621.25								
		5		0.15	1.15	1362			77	625.40	14.6	4.7	3	-6.5	—	251		41
		4		0.[illegible]	1.23	1369			77	629.66	14.7	4.7	3					
		4		0.15	1.15	1371			79	633.81								
		4		0.15	1.16	1372			80	637.92	14.5	4.9	3					
		3		0.15	1.16	1369			81	642.03								
		3		0.15	1.16	1320			83	646.17	14.5	4.9						
		3		0.15	1.16	1373			84	650.31								
		2		0.13	1.04	1315			86	654.36	15.2	4.4	3					
		2		0.13	1.04	1320			87	658.15								
		2		0.12	0.97	1316			88	661.97	15.1	4.4	4					
		1		0.12	0.97	1314			89	665.75								
		1		0.12	0.97	1318			90	669.50	15.3	4.3	4			250		40
		1		0.12	0.97	1318			91	673.25								

TDF Initial Débit (pi³/min): 0.005	Pression (inhg) : —15"Hg	Volume ini (pi³):	Volume fin (pi³):	Volume (pi³):	Fuite Pitot (ΔP) :
TDF Final Débit (pi³/min):	Pression (inhg) :	Volume ini (pi³):	Volume fin (pi³):	Volume (pi³):	

REMARQUES | O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

Changement réfrigérant — cassé à cause du gel

TECHNICIEN :

P2

CONSULAIR — GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : COJV - E2

February/2017

Usine :	Date :	P. Bar (po Hg) :	# Cold box :
Ville:		P. Stat. (po H_2O) :	
ID point d'émission :	Sonde N° :	Module N° :	K' :
Diamètre :	Cp :	Kc :	
Distance avant :	Buse N° :	Ko :	Niveau du manomètre:
Distance après :	Coef :	Distance P-T°-B :	Zéro du manomètre:

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										673,25								
	2	1	5	0.12	0.98	1318	60	60	92	677,00	15.3	4.3	4	-5.5	—	252	—	39
		1		0.12	0.98	1311			94	680,74								
		1		0.12	0.99	1300			94	684,49								
		2		0.12	0.98	1317			95	688,23	15.3	4.3	4					
		2		0.12	0.98	1322			96	691,97								
		2		0.12	0.98	1318			96	695,73					—	255	—	40
		3		0.12	0.98	1325			98	699,41	15.3	4.3						
		3		0.11	0.90	1320			98	703,00								
		3		0.11	0.90	1318			99	706,58								
		4		0.10	0.82	1310			100	709,94								
		4		0.10	0.82	1310			100	713,38	15.3	4.4						
14h17		4		0.10	0.83	1314			101	716,79								
		5		~~0.10~~	~~0.83~~	~~1300~~			~~101~~									
		5																
		5																
		6																
		6																
		6																

TDF Initial Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3): Fuite Pitot (ΔP) :

TDF Final Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

Fin bris équipement (réfrigérant) changement de point !

TECHNICIEN :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_07_V5 (1/2) Avril 2018

MEV

CODE DE L'ESSAI : COSV - 2

Vérification avant essai et montage du dispositif de prélèvement - COSV (SPE 1/RM/2)

Compagnie: AEM - Myl	Projet: 18-5578	# Ensemble de verrerie : 10
Source: Incinérateur	Essai: 2	# Hot Box : OR-2
Date : 28-09-2018		Heure :

1 - DÉCONTAMINATION & VÉRIFICATION AVANT ESSAI - BUSE ET SONDE

Item	Remarques	Brosse - DHA	HA
		3x Ch.	3x Ch.
Buse et sonde		✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :		OUI	NON

2 - VÉRIFICATION AVANT ESSAI - TRAIN

Item	Remarques	HA	
		3x Ch.	
Train		✓	
Vérification de la verrerie du train d'échantillonnage à conserver :		OUI	NON

3 - VOLUME D'EAU RECUEILLIE

ITEM #	PIÈCE	CONTENU	POIDS (g)		
			APRÈS	AVANT	TOTAL
1	Condenseur (réfrigérant)	VIDE			
2	Trappe de résine *	XAD-2	131,7	125.0	
3	Trappe à condensat	VIDE	375.6	249.5	
4	Barboteur Greenburg-Smith	ÉTHYLÈNE GLYCOL (100-150 mL)	713.9	700.8	
5	Barboteur modifié	VIDE	—	—	
6	Contenant de dessicant	GEL DE SILICE	1723.1	1713.0	134.8
				TOTAL	

* : Recouvrir de papier d'aluminium après la pré-pesée, et retirer avant la pesée après essai.

REMARQUES :

trappe XAD: 1172

4 - LOTS DES SOLVANTS UTILISÉS

SOLVANTS	# LOT
Dichlorométhane (grade optima)	
Hexane (grade optima)	
Acétone (grade optima)	
Éthylène glycol	
Eau HPLC	
Résine XAD-2	

Vérifié par: Date: Endroit:

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_07_V5 (2/2)
Avril 2018

Récupération finale du dispositif de prélèvement - COSV (SPE 1/RM/2)

Date de récupération :	28.09.2018	Heure de récupération:	15h00
Nettoyage de l'extérieur des différentes pièces :	✓		
Conditionnement (HA) des contenants **(verre ambré)** de récupération :	LV		

Contenant 1 - Buse-Sonde

Item	Remarques	Brosse HA	HA 3x Ch.	Niveau
Buse et Sonde		✓	LV	LV

Contenant 2 - Filtre

Filtre	Pétri scellé avec ruban de teflon - dans le papier d'aluminium	LV

Contenant 3 - Récupération de la partie arrière du Porte-filtre au Condenseur (avant trappe)

Item	Remarques	Tremp. H-A 5 min Ch.	HA 3x Ch.	Niveau
Avant trappe résine		/	LV	LV

Contenant 4 - Récupération de la Trappe de résine XAD-2

Trappe de résine XAD-2	Sceller avec ruban de teflon - enveloppé papier d'aluminium	LV

Contenant 5 - Récupération de la Trappe à condensat au 1er Barboteur (eau)

Item (dans l'ordre)	Remarques	H_2O HPLC 3x	Niveau
Eau		LV	LV

Contenant 6 - Rinçage final de la partie arrière du Porte-filtre au dernier Barboteur

Item	Remarques	HA 3x Ch.	Niveau
Rinçage final		LV	LV

Les pots doivent être en verre ambré.

Remarques

Blancs:

Blanc de terrain (1x pour chaque 3 essais) - Faire aspirer volume d'air équivalent à tous les tests de fuite	
Résine XAD-2 (environ 40g, 1 tube)	
Eau HPLC	
Éthylène Glycol	
Acétone	
Hexane	

Récupération par :	Date :	Endroit :

CONSULAIR

Train d'échantillonnage - ORGANIQUES

Compagnie: AE Meliadine		Projet: 5528	
Échantillonné le: 23-09-2018		Récupéré par:	
Source: Incinérateur	Essai: ~~3E~~ E-2	Date: 23-09-2018	Heure:

CAISSE # 10

Décontamination			Sol. RBS	Eau + Savon	Eau démin.	DHA	HA
Item (dans l'ordre)	#	Nom de la pièce	Ok				
By pass		By pass	✓	✓	✓	✓	✓
Cloche femelle		Cloche femelle	✓	✓	✓	✓	✓
Support à filtre en téflon		Support à filtre en téflon	✓	✓	✓	✓	✓
Cloche mâle		Cloche mâle	✓	✓	✓	✓	✓
Réfrigérant		Cup MF	✓	✓	✓	✓	✓
		Réfrigérant	✓	✓	✓	✓	✓
		Cowit MF	✓	✓	✓	✓	✓
Trappe à condensat		Trappe à condensat	✓	✓	✓	✓	✓
Grand L							
		Grand " L"	✓	✓	✓	✓	✓
Barbotteur Greenberg Smith		Barbotteur Greenberg Smith	✓	✓	✓	✓	✓
Coude		Coude	✓	✓	✓	✓	✓
Barbotteur Std		Barbotteur Std	✓	✓	✓	✓	✓
Pot pour le proofing		Pot pour le proofing	✓	✓	✓		✓
Nombre total de pièces		# Unique	988				

Sur le terrain

Verrerie de laboratoire							
Bouteilles de verre ambrée (5)							
Teflon							
Aluminium							
Trappe de résine		Trappe de résine					

Décontaminé par: JD	Date: 24/08/2018	Endroit: Québec
Code de décontamination (pot): JD-24/08/2018-OR10		

\# Lot Des Solvants:
Dichlorométhane: 162956
Hexane: 182082
Acétone: 181822

Commentaires

P1

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : COSU-E3

février-2017

Usine : AE Meliadine	Date : 29.09.2019	P. Bar (po Hg) :	# Cold box : ORRE V1
Ville: Rankin Inlet		P. Stat. (po H_2O) :	
ID point d'émission : Incinerateur	Sonde N° : 03.06 Q503	Module N° : 19 COMP	K' : 26.19
Diamètre : 32.5	Cp : 0.781	Kc : 0.997	
Distance avant : 5D	Buse N° : 3Q.503	Ko : 1.000 ✓	Niveau du manomètre: ✓
Distance après : 2D	Coef : 0.4958	Distance P-T°-B : ✓	Zéro du manomètre: ✓

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										729,20								
16h13	1	6	5	0,24	1,85	1396	60	60	75	734,29	12,9	6,0	3	-7,5	✓	250	✓	40
		6		0,24	1,81	1377			76	739,41								
		6		0,24	1,82	1386			76	744,61	13,0	6,0	3					
		6		0,24	1,83	1385			78	749,76								
		5		0,24	1,82	1405			79	754,91	12,8	6,2	3					
		5		0,24	1,81	1410			80	760,08								
		4		0,21	1,63	1366			81	764,98								
		4		0,23	1,77	1380			82	770,00	13,7	5,5	3			248		
		4		0,23	1,77	1387			82	775,00								
		3		0,23	1,77	1396			83	780,01								
		3		0,23	1,76	1403			84	785,00	13,7	5,5	3					
		3		0,23	1,75	1409			84	789,95								
		2		0,18	1,37	1382			84	794,45								
		2		0,19	1,48	1381			86	799,04								
		2		0,18	1,39	1387			87	803,50	14,5	5,2						
		1		0,18	1,40	1380			87	807,95	14,2	5,1						
		1		0,18	1,39	1400			88	812,39								
		1		0,18	1,38	1410			89	816,86								

TDF Initial Débit (pi^3/min): <0.01 Pression (inhg) : 15" Hg Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

TDF Final Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

Fuite Pitot (ΔP) : ✓

REMARQUES O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN :

P2

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

Code d'essai : COSV - E3

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

février-2017

Usine :	Date :	P. Bar (po Hg) :	# Cold box :
Ville:		P. Stat. (po H_2O) :	
ID point d'émission :	Sonde N° :	Module N° :	K' :
Diamètre :	Cp :	Kc :	
Distance avant :	Buse N° :	Ko :	Niveau du manomètre:
Distance après :	Coef :	Distance P-T°-B :	Zéro du manomètre:

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Compteur Entrée	Compteur Sortie	Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	CO_2 (%v)	CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Filtre (°F)	Sortie (°F)	Trappe/Filtre (°F)
										816.86								
	2	1	5	0.18	1.38	1413	60	60	90	821.26	4.1	5.2	3	-60				
		1		0.18	1.38	1417			90	825.67								
		1		0.17	1.30	1423			91	829.97								
		2		0.17	1.30	1440			94	834.30								
		2		0.17	1.29	1438			92	838.54								
		2		0.17	1.30	1443			94	842.77								
		2		0.17	1.29	1450			95	847.00								
		3		0.24	1.25	1529			95	851.90								
		3		0.24	1.25	1535			97	856.84								
		4		0.24	1.26	1533			97	861.77								
		4		0.24	1.26	1533			98	866.72								
		4		0.24	1.26	1542			99	871.64								
		5		0.24	1.26	1541			99	876.54								
		5		0.23	1.68	1548			101	881.29								
		5		0.22	1.65	1500			101	886.00								
		6		0.22	1.68	1463			102	890.71								
		6		0.22	1.69	1457			103	895.49								
		6	5	0.22	1.69	1460	60	60	103	900.26								

TDF Initial Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	Fuite Pitot (ΔP) :
TDF Final Débit (pi^3/min):	Pression (inhg) :	Volume ini (pi^3):	Volume fin (pi^3):	Volume (pi^3):	

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN :

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_07_V5 (1/2) Avril 2018

CODE DE L'ESSAI : MRL- COSU - E3

Vérification avant essai et montage du dispositif de prélèvement - COSV (SPE 1/RM/2)

Compagnie: AE Molsdine	Projet: CS28	# Ensemble de verrerie : 1
Source: Incinération	Essai: #3	# Hot Box : 022 - V1
Date : 28-09-2018		Heure : 16h00

1 - DÉCONTAMINATION & VÉRIFICATION AVANT ESSAI - BUSE ET SONDE

Item	Remarques	Brosse - DHA	HA
		3x Ch.	3x Ch.
Buse et sonde		✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :		OUI	NON

2 - VÉRIFICATION AVANT ESSAI - TRAIN

Item	Remarques	HA
		3x Ch.
Train		✓
Vérification de la verrerie du train d'échantillonnage à conserver :		OUI / NON

3 - VOLUME D'EAU RECUEILLIE

ITEM #	PIÈCE	CONTENU	POIDS (g)		
			APRÈS	AVANT	TOTAL
1	Condenseur (réfrigérant)	VIDE			
2	Trappe de résine *	XAD-2 1151	121.0	114.1	
3	Trappe à condensat	VIDE	523.10	304.5	
4	Barboteur Greenburg-Smith	ÉTHYLÈNE GLYCOL (100-150 mL)	751.7	729.0	
5	Barboteur modifié	VIDE			
6	Contenant de dessicant	GEL DE SILICE	1734.0	1723.1	259.1
				TOTAL	

* : Recouvrir de papier d'aluminium après la pré-pesée, et retirer avant la pesée après essai.

REMARQUES :

4 - LOTS DES SOLVANTS UTILISÉS

SOLVANTS	# LOT
Dichlorométhane (grade optima)	
Hexane (grade optima)	
Acétone (grade optima)	
Éthylène glycol	
Eau HPLC	
Résine XAD-2	

Vérifié par:	Date:	Endroit:

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_07_V5 (2/2)
Avril 2018

Récupération finale du dispositif de prélèvement - COSV (SPE 1/RM/2)

Date de récupération : 30 · 09 - 2018		Heure de récupération: 8h00	
Nettoyage de l'extérieur des différentes pièces :	✓		
Conditionnement (HA) des contenants **(verre ambré)** de récupération :	✓		

Contenant 1 - Buse-Sonde

Item	Remarques	Brosse HA	HA 3x Ch.	Niveau
Buse et Sonde		✓	✓	✓

Contenant 2 - Filtre

Filtre	Pétri scellé avec ruban de teflon - dans le papier d'aluminium	✓

Contenant 3 - Récupération de la partie arrière du Porte-filtre au Condenseur (avant trappe)

Item	Remarques	Tremp. H-A 5 min Ch.	HA 3x Ch.	Niveau
Avant trappe résine		✓	✓	✓

Contenant 4 - Récupération de la Trappe de résine XAD-2

Trappe de résine XAD-2	Sceller avec ruban de teflon - enveloppé papier d'aluminium	✓

Contenant 5 - Récupération de la Trappe à condensat au 1er Barboteur (eau)

Item (dans l'ordre)	Remarques	H_2O HPLC 3x	Niveau
Eau		✓	✓

Contenant 6 - Rinçage final de la partie arrière du Porte-filtre au dernier Barboteur

Item	Remarques	HA 3x Ch.	Niveau
Rinçage final		✓	✓

Les pots doivent être en verre ambré.

Remarques

Blancs:

Blanc de terrain (1x pour chaque 3 essais) - Faire aspirer volume d'air équivalent à tous les tests de fuite	
Résine XAD-2 (environ 40g, 1 tube)	
Eau HPLC	
Éthylène Glycol	
Acétone	
Hexane	

Récupération par :	Date :	Endroit :

CONSULAIR

Train d'échantillonnage - ORGANIQUE

Compagnie:	AE Molindine	Projet:	5528
Échantillonné le:		Récupéré par:	
Source: Incinérateur	Essai: COSV E3	Date:	Heure:

CAISSE # 1

Item (dans l'ordre)	#	Nom de la pièce	Sol. RBS	Eau + Savon	Eau démin.	DHA	HA
		Décontamination	Ok				
By pass		By pass	✓	✓	✓	✓	✓
Cloche femelle		Cloche femelle	✓	✓	✓	✓	✓
Support à filtre en téflon		Support à filtre en téflon	✓	✓	✓	✓	✓
Cloche mâle		Cloche mâle	✓	✓	✓	✓	✓
Réfrigérant							
		Réfrigérant	✓	✓	✓	✓	✓
Trappe de résine		Trappe de résine					
Trappe à condensat		Trappe à condensat	✓	✓	✓	✓	✓
Grand L		Tige MM	✓	✓	✓	✓	✓
		Tige MF	✓	✓	✓	✓	✓
		Coude 4 po.	✓	✓	✓	✓	✓
Barbotteur Greenberg Smith		Barbotteur Greenberg Smith	✓	✓	✓		
Coude		Coude	✓	✓	✓	✓	✓
Barbotteur Std		Barbotteur Std	✓	✓	✓	✓	✓
Pot pour le proofing							
Bouteille de verre ambrée (5)		Bouteille de verre ambrée	✓	✓	✓		✓
Garnitures (Téflon + Aluminium)							
Nombre total de pièces		# Unique	495				

Décontaminé par: JD	Date: 28/08/2018	Endroit: Québec
Code de décontamination (pot): JD-28/08/2018		

Lot des Solvants:
Dichlorométhane: 182958
Hexane: 175762
Acétone: 181822

Commentaires

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT

Formulaire: F_09_V5

FEUILLE DE VÉRIFICATIONS ET DE DONNÉES DE PRÉLÈVEMENT MANUEL

Code d'essai : COSV - Blanc

February/2017

Usine : AEM-Mel	Date :	P. Bar (po Hg) :	# Cold box :
Ville: Melbourne		P. Stat. (po H_2O) :	
ID point d'émission : incinérateur	Sonde N° :	Module N° : 25	K' :
Diamètre :	Cp :	Kc : 0.999	
Distance avant :	Buse N° :	Ko :	Niveau du manomètre:
Distance après :	Coef :	Distance P-T°-B :	Zéro du manomètre:

Heure	Trav.	Point	Temps prélèv. (min)	ΔP (po H_2O)	ΔH (po H_2O)	Températures (°F) Cheminée	Températures (°F) Compteur Entrée	Températures (°F) Compteur Sortie	Températures (°F) Orifice	Volume Prélevé (pi^3)	Masse molaire O_2 (%v)	Masse molaire CO_2 (%v)	Masse molaire CO (ppmv)	Vaccum po. Hg	Température Sonde (°F)	Température Filtre (°F)	Température Sortie (°F)	Température Trappe/Filtre (°F)
										34.7								
							71	71	71	35.7								

TDF Initial Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3): Fuite Pitot (ΔP) :

TDF Final Débit (pi^3/min): Pression (inhg) : Volume ini (pi^3): Volume fin (pi^3): Volume (pi^3):

REMARQUES — O_2/CO_2 - Utiliser le formulaire de gaz en continu pour calibration des appareils.

TECHNICIEN : JFC

CONSULAIR GESTION GLOBALE AIR ET ENVIRONNEMENT | F_07_V5 (1/2) 2018 | Avril | CODE DE L'ESSAI: MEV COSV-2 blanc

Vérification avant essai et montage du dispositif de prélèvement - COSV (SPE 1/RM/2)

Compagnie: AE Meliadine	Projet: 5D28	# Ensemble de verrerie : 22
Source: Incinérateur	Essai: #2	# Hot Box : OR2-V1
Date : 23-09-2018		Heure : 10h00

1 - DÉCONTAMINATION & VÉRIFICATION AVANT ESSAI - BUSE ET SONDE

Item	Remarques	Brosse - DHA	HA
		3x Ch.	3x Ch.
Buse et sonde		✓	✓
Vérification de la buse et sondes d'échantillonnage à conserver :		OUI	NON

2 - VÉRIFICATION AVANT ESSAI - TRAIN

Item	Remarques	HA	
		3x Ch.	
Train		✓	
Vérification de la verrerie du train d'échantillonnage à conserver :		OUI	NON

3 - VOLUME D'EAU RECUEILLIE

ITEM #	PIÈCE	CONTENU	POIDS (g)		
			APRÈS	AVANT	TOTAL
1	Condenseur (réfrigérant)	VIDE			
2	Trappe de résine *	XAD-2 1155	123.4	123.3	
3	Trappe à condensat	VIDE	371.8	371.8	
4	Barboteur Greenburg-Smith	ÉTHYLÈNE GLYCOL (100-150 mL)	686.2	687.0	
5	Barboteur modifié	VIDE	—	—	
6	Contenant de dessicant	GEL DE SILICE	1730	1730	
				TOTAL	∅

* : Recouvrir de papier d'aluminium après la pré-pesée, et retirer avant la pesée après essai.

REMARQUES :

4 - LOTS DES SOLVANTS UTILISÉS

SOLVANTS	# LOT	
Dichlorométhane (grade optima)		
Hexane (grade optima)	156309	
Acétone (grade optima)	153394	
Éthylène glycol	142823	
Eau HPLC	135150	
Résine XAD-2		
Vérifié par:	Date:	Endroit:

CONSULAIR
GESTION GLOBALE AIR ET ENVIRONNEMENT

F_07_V5 (2/2)
Avril 2018

Récupération finale du dispositif de prélèvement - COSV (SPE 1/RM/2)

Date de récupération : 24.09.2018		Heure de récupération : 8h00	
Nettoyage de l'extérieur des différentes pièces : ✓	✓		
Conditionnement (HA) des contenants **(verre ambré)** de récupération :	✓		

Contenant 1 - Buse-Sonde

Item	Remarques	Brosse HA	HA 3x Ch.	Niveau
Buse et Sonde		✓	✓	✓

Contenant 2 - Filtre

Filtre	Pétri scellé avec ruban de teflon - dans le papier d'aluminium	✓

Contenant 3 - Récupération de la partie arrière du Porte-filtre au Condenseur (avant trappe)

Item	Remarques	Tremp. H-A 5 min Ch.	HA 3x Ch.	Niveau
Avant trappe résine		✓	✓	✓

Contenant 4 - Récupération de la Trappe de résine XAD-2

Trappe de résine XAD-2	Sceller avec ruban de teflon - enveloppé papier d'aluminium	✓

Contenant 5 - Récupération de la Trappe à condensat au 1er Barboteur (eau)

Item (dans l'ordre)	Remarques	H_2O HPLC 3x	Niveau
Eau		✓	✓

Contenant 6 - Rinçage final de la partie arrière du Porte-filtre au dernier Barboteur

Item	Remarques	HA 3x Ch.	Niveau
Rinçage final		✓	✓

Les pots doivent être en verre ambré.

Remarques

Blancs:

Blanc de terrain (1x pour chaque 3 essais) - Faire aspirer volume d'air équivalent à tous les tests de fuite	✓
Résine XAD-2 (environ 40g, 1 tube)	✓
Eau HPLC	✓
Éthylène Glycol	
Acétone	✓
Hexane	✓

Récupération par : [illegible]	Date : 15-09-20	Endroit : MEL

CONSULAIR

Train d'échantillonnage - ORGANIQUES

Compagnie:	AE Meliadine	Projet:	S528
Échantillonné le:	23-09-2018	Récupéré par:	
Source: Incinérateur	Essai: [illegible] BL	Date: 23-09-2018	Heure: 10h00

CAISSE # 22

Décontamination			Sol. RBS	Eau + Savon	Eau démin.	DHA	HA
Item (dans l'ordre)	#	Nom de la pièce	Ok				
By pass 125 mm	(N/A)	By pass 125 mm	✓	✓	✓	✓	✓
Cloche femelle	(N/A)	Cloche femelle	✓	✓	✓	✓	✓
Support à filtre en téflon	(N/A)	Support à filtre en téflon	✓	✓	✓	✓	✓
Cloche mâle	B	Cloche mâle	✓	✓	✓	✓	✓
Réfrigérant	OR-13-R1	Réfrigérant	✓	✓	✓	✓	✓
	OR-13-R2	Rallonge de réfrigérant	✓	✓	✓	✓	✓
	(N/A)	~~Coude réfrigérant~~ Tige MF[illegible]	✓	✓	✓	✓	✓
Trappe de résine		Trappe de résine					
Trappe à condensat verticale	OR-22-TC	Trappe à condensat verticale	✓	✓	✓	✓	✓
Coude	(N/A)	Coude	✓	✓	✓	✓	✓
Barbotteur Greenberg Smith	(N/A)	Barbotteur Greenberg Smith	✓	✓	✓	✓	✓
Coude	(N/A)	Coude	✓	✓	✓	✓	✓
Barbotteur Std	(N/A)	Barbotteur Std	✓	✓	✓	✓	✓
Bouteille de verre ambrée (1)		...ambrée	✓	✓	✓		✓
Garnitures (Téflon + Aluminium)							
Nombre total de pièces	12	...e	1000				

Bouteille de verre

Décontaminé par: JD	...2018	Endroit: QC	
Code de décontamination (pot):	# ... 3 ... 08/12/2018-OR22		

Lot Des Solvants:
Dichlorométhane: 176773
Hexane: 175762
Acétone: 181822

Commentaires

Formulaire mis-à-jour le 2018-05-14