

Mars Metal Specialty Castings

A division of Marswell Metal Industries

TOXICS REDUCTION ACT

**PHASE I TOXIC SUBSTANCE
REDUCTION PLANS**

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Attachments

List of Attachements

Attachment Number	Document Type	Toxic Substance	Version
1	Toxic Substance Reduction Plan	Lead	1.0
2	Toxic Substance Reduction Plan	Antimony	1.0
3	Toxic Substance Reduction Plan	Xylene	1.0
4	Toxic Substance Reduction Plan	Ethyl benzene	1.0

As required by s. 3 of the TRA, an individual Plan has been prepared for each of the Toxic Substances. In preparing the Plans, the Facility has prepared individual Toxic Substance Reduction Plans for the following prescribed Toxic Substances:

- Lead
- Xylene
- Antimony
- Ethyl Benzene

Per guidance provided in s. 5.2 of the MOE publication *Toolkit for Toxic Substance Reduction Planning*, version dated February 15, 2012 (the MOE Planning Toolkit), where toxic substances travel together through a process, a Facility may develop a Master Document which can be referred to in individual Toxic Substance Reduction Plans provided the Plan still satisfies all requirements of the TRA and O. Reg. 455/09. Greenflow has elected to take advantage of this administrative efficiency, by utilizing references, where appropriate, to various contents of a Master Document in order to satisfy the Toxic Substance Reduction Plan preparation requirements of the TRA and O. Reg. 455/09. This approach was taken as it minimizes the duplication of information to the greatest extent allowed by the TRA and O. Reg. 455/09.

Confirmation Statements



TECHNICAL MEMORANDUM

May 28, 2013

Mark Wiedener
Greenflow Environmental Services Inc.

**LICENSED TOXIC SUBSTANCE REDUCTION PLANNER CERTIFICATION STATEMENT FOR PHASE I
TOXIC SUBSTANCE REDUCTION PLANS FOR MARSWELL METAL INDUSTRIES LTD, INCLUDING
ITS DIVISIONS MARSKEEL, MARS METAL SPECIALTY CASTINGS.**


Dear Mr. Milne,

Greenflow Environmental Services Inc. (Greenflow) was engaged by Marswell Metal Industries Ltd. (the Facility) to provide guidance pertaining to Phase I Toxic Substance Reduction Plan preparation under the *Toxics Reduction Act* (TRA), including providing confirmation of Phase I Toxic Reduction Plans (the Plans).

The following Planner Confirmation Statement, which comes in lieu of the Planner Certification Statement required under s. 19.1(4) of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 11 of O. Reg. 214/11) satisfies the requirements for the Plans that are assembled as a single document as of the date of this Planner Confirmation Statement. Furthermore, the following confirmation statement is limited to the respective versions of the Plans which are dated as indicated in the Certification Statement:

As of (May 28, 2013), I, Mark Wiedener confirm that I am familiar with the processes at the Marswell Metal Industries Ltd. Facility that use of create the toxic substances referred to below, that I agree with the estimates referred to in its contents, and it satisfies all other requirements, with the exception of the regulatory deadline as determined by the Toxic Reduction Act and Ontario Regulation 455/09.

- *Lead (May 28, 2013)*
- *Antimony (May 28, 2013)*
- *Xylene (May 28, 2013)*
- *Ethyl Benzene (May 28, 2013)*


Mark Wiedener
Toxic Substance Reduction Planner
License No. TSRP 0255

May 29, 2013
Date

Greenflow Environmental Services Inc.
9151 Marsis Drive
Burlington, Ontario, Canada
L7R 9G5
1 800 287-5411



TECHNICAL MEMORANDUM

Toxic Substance Reduction Plans Confirmation by Highest Ranking Employee

As required by s. 4(2) of the *Toxics Reduction Act* (TRA), Toxic Substance Reduction Plans must contain a certification signed by the highest ranking employee at the Facility who has management responsibilities relating to the Facility.

As a result of the inability to meet the regulatory deadline of December 31, 2012, this Plan contains a confirmation statement from the highest ranking employee in lieu of the required certification statement:

*As of (date) MAY 29, 2013, I, (insert name) KEVIN MILNE, confirm that I have read the toxic substance reduction plans for the toxic substances referred to below and am familiar with their contents, and to my knowledge the plans are factually accurate and comply with the *Toxics Reduction Act*, 2009 and Ontario Regulation 455/09 made under that Act, with the exception of the certification statements as a result of the inability of the Facility, in spite of its best efforts, to meet the December 31st regulatory deadline. This was mainly due to the Facility allocating time and resources towards updating ministry approvals with regard to air and seeking proper testing to aid in the creation of this document.*

- *Lead (May 28, 2013)*
- *Antimony (May 28, 2013)*
- *Xylene (May 28, 2013)*
- *Ethyl Benzene (May 28, 2013)*



Kevin Milne
President
Marshall Metal Industries Ltd.

MAY 29, 2013
Date

Marswell Metal Industries Ltd.

**Toxic Substance
Reduction Plan**

**Lead
Version 1.0**

Document Version Control

This document constitutes the Toxic Substance Reduction Plan Version 1.0 for the prescribed toxic substance referred to as “Lead” under the *Toxics Reduction Act*. S.22 of the Ontario Regulation (O.Reg) 455/09 provides the framework for Plan review and requirements for a new version of the Plan. This plan satisfies all requirements contained within O.Reg. 455/09, except for the inclusion of the certification statements from the Highest Ranking Employee (HRE), as well as the licensed Toxic Substance Reduction (TSRP) Planner. This is due to the fact that Mars Metals, in spite of their best efforts, were unable to submit the Plan to the Ministry on, or before the prescribed deadline for Phase I toxic substances of December 31st, 2012. Unlike some other pieces of legislation, the TRA does not provide Ministry staff with the authority to change the reporting deadlines, and on the advice of Ontario’s Toxic Substance Reduction Programs administration, in place of the certification statements, this document will include a confirmation statement from the HRE at the Facility, as well as a confirmation statement from the licensed TSRP Planner.

This plan is to be updated by the end of the calendar year in which a significant change in processes (as defined in s. 1(3) of O.Reg 455/09) has occurred. The first mandatory Plan update is required to be completed by December 31st, 2018.

Future updates of this Plan will be assigned a new version number.

Version	Date	Revision Description	Reviewed by (Facility Contact)
1.0		TSRP Version 1.0	Kevin Milne

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Executive Summary

This Toxic Substance Reduction Plan (the Plan) was prepared in accordance with s.3 of the *Toxics Reduction Act* (TRA) and s.9 of the Ontario Regulation (O.Reg.) 455/09 for the prescribed toxic substance referred to as “Lead” (the Toxic Substance) for Mars Metal Specialty Castings, MarsKeel & MarShield – a division of Marswell Metal Industries. The services of these divisions include: pattern making, mold manufacturing, custom/production castings, priming, and painting. The facility is located at 4140 Morris Drive in Burlington, Ontario. The main products produced are counterweights, alloyed lead, certified nuclear castings, and keels for the sailing industry. The facility operates from 6:30AM – 6:30 PM Monday to Thursday, and 6:30AM – 5:30PM on Fridays. Production does not occur during weekend hours. Guidance within the Ontario Ministry of the Environment (MOE) publication *Toolkit for Toxic Substance Reduction Planning*, version from February 15th, 2012 (the MOE Planning Toolkit) was followed, as appropriate, during the making of this document.

The TRA was passed in the Ontario Legislature in June 2009. The MOE has stated that the goal of the TRA is to promote reductions in the use and creation of prescribed toxic substances, inform Ontarians about toxic substances in their communities and to help ensure that Ontario is properly positioned to be competitive within the global economy, which has been placing greater emphasis on ‘green initiatives’.

The TRA is intended so that regulated facilities give a consistent level of consideration to opportunities for reducing, or eliminating, where possible, the prescribed substances; however, it does not restrict or require elimination of prescribed toxic substances.

Under the TRA, regulated facilities are required to:

- Perform quantification, accounting and reporting on the toxic substance use, creation, amount contained product, and release at the Facility on an annual basis;
- Prepare Toxic Substance Reduction Plans in which it is documented, where feasible, how the use and creation of toxic substances might be reduced;
- Have the Toxic Substance Reduction Plan certified by an MOE licensed Toxic Substance Reduction Planner (the Planner) as well as the Highest Ranking Employee (HRE) at the Facility;
- Prepare Plan Summaries containing various components of the Toxic Substance Reduction Plans and make them available to the public;
- Submit annual reports on progress made on the Plans; and
- Update the Plans at least every five years.

Unlike tracking, accounting, reporting and preparation of a Toxic Substance Reduction Plan, which are all requirements; the implementation of any toxic substance reduction

options identified in the Plan is not a requirement of the TRA or O.Reg. 455/09. The Facility is captured by the requirements of the TRA pertaining to the Toxic Substance since the Facility meets the TRA's definition of target facilities within North American Industry Classification System (NAICS) codes by falling under the NAICS code 331529 (Non-Ferrous foundries – except die-casting) and falls under Schedule 3 of O.Reg. 419/05, thus AERMOD will be used to model the emissions from Mars Metal's facility.

The main emissions from this site are from the lead casting process and the product finishing process, with a small amount of emissions being from the comfort heating. A source testing program was conducted between August 15th and August 24th of 2011 to evaluate the emissions produced by the lead casting process. Mars Metal has operated previously under Certificate of Approval (Air) 8-3385-94-997. The Facility was inspected by the Ministry of the Environment local Halton district office and an order was issued to update the Certificate of Approval.

A Toxic Substance Reduction Plan Component Checklist (the Plan Component Checklist), which outlines the minimum content requirements of a Toxic Substance Reduction Plan, is provided following this Executive Summary. This Plan is structured so that section headings correspond to the items in the Plan Component Checklist. This approach is designed to provide a clear depiction of this Plan's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09.

S.4(1) of the TRA requires that a Plan include either a statement of the Facility's intent to reduce the use and/or creation of the Toxic Substance at the Facility, or the reasons for not including this statement, as well as objectives of the Plan.

The Toxic Substance has triggered reporting under the TRA and O.Reg. 455/09 due to three activities at the Facility which are defined as "uses" of the Toxic Substance under the TRA Framework. These three "uses" are:

- Lead casting
- Product finishing
- Comfort Heating

Since the Toxic Substance for which this plan is being completed is not "created" at the Facility, but instead is the raw material for the finished product, this Plan does not intend to address the reduction in the "creation" of the Toxic Substance, as the only feasible way to accomplish this would be to reduce production levels. In light of the aforementioned information, the objectives of this Plan are as follows:

- Provide support for the Facility's position with respect to the Statement of Intent of this Plan; and

- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

A Plan Summary corresponding to this Plan, which was prepared in accordance with s.23 of O.Reg 455/09 is included as Appendix C of this Plan. Information contained in this Plan summary has been provided to the MOE through the 'Single Window' reporting system. Furthermore, the Plan is available on Mars Metal's website and can be provided to a member of the public upon written request.

This Plan documents the Facility's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

Toxic Substance Reduction Plan Component Checklist

The following checklist has been adapted from Appendix 4 of the MOE Planning Toolkit. It outlines mandatory Toxic Substance Reduction Plan components and provides a reference to the section of this Plan which provides the required information to satisfy each mandatory component.

Mandatory Plan Component	Provided?	Plan Section Reference
Basic facility information	<input checked="" type="checkbox"/> Yes	
Planner license numbers	<input checked="" type="checkbox"/> Yes	
Statement of intent to reduce the use and/or creation of toxic substances (or reasons for not including one)	<input checked="" type="checkbox"/> Yes	
Description of each process that uses the toxic substance <ul style="list-style-type: none"> • Description of how, when, where & why the substance is used or created • Records of identification and description of stages and processes of a facility's operation and a record containing process flow diagrams 	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes	
Toxic substance accounting information <ul style="list-style-type: none"> • Quantifications at process level during previous year • Record of methods and rationale for selecting each method used to track and quantify toxic substance 	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes	
Estimates of direct and indirect annual costs associated with the toxic substance	<input checked="" type="checkbox"/> Yes	
Options considered for Reduction <ul style="list-style-type: none"> • Identification of toxic substance reduction options in each of seven toxic reduction categories stipulated in O.Reg. 455/09, or explanation of why no option could be identified • Estimate of potential reductions in use, creation, contained in product,, release (air, land, and water), disposal, transfer of toxic substances achieved if option was implemented and the information used to develop the estimate • Identification of technically feasible options 	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes	

<ul style="list-style-type: none"> Analysis of economic feasibility of technically feasible options, including anticipated savings and payback period. 	<input checked="" type="checkbox"/> Yes	
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For each option to be implemented

A description of implementation steps and a timetable for implementation.	<input type="checkbox"/> No / N/A	
A summary of estimated toxics reduction in use, creation, released, disposed, transferred for recycling, and/or contained in product (as a percentage and unit of measurement)		
Anticipated dates for achieving use and creation reductions	<input type="checkbox"/> No / N/A	

OR If no options were implemented

Provide the rationale for this decision	<input checked="" type="checkbox"/> Yes	
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Planner recommendations and rationale	<input checked="" type="checkbox"/> Yes	
Certifications by the highest ranking employee and toxics reduction planner <ul style="list-style-type: none"> Confirmation statements made by the highest ranking employee and the toxics reduction planner 	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	

1.0 Introduction

Mars Metal Specialty Castings, MarsKeel & MarShield are divisions of Marswell Metal Industries, a lead casting, lead fabrication, and finishing company. The services of these divisions include pattern making, mold manufacturing, and custom production castings, priming and painting. The Facility is located at 4140 Morris Drive in Burlington, where the main products produced are counterweights, alloyed lead, certified nuclear castings, and keels for the sailing industry.

Mars Metal has operated previously under Certificate of Approval (Air) 8-3385-94-997. The facility was inspected by the Ministry of Environment local Halton office and an order was issued to update the Certificate of Approval.

The purpose of this document is to satisfy the requirements laid out by the Toxics Reduction Act (TRA) and O.Reg 455/09. The TRA is intended so that regulated facilities give a consistent level of consideration to opportunities for reducing prescribed substances; however, it does not restrict or require elimination of prescribed toxic substances.

Under the TRA, regulated facilities are required to:

- Perform quantification, accounting and reporting on the toxic substance use, creation, amount contained in product and release at the Facility on an annual basis
- Prepare Toxic Substance Reduction Plans in which it is documented, where feasible, how the use and creation of toxic substances might be reduced;
- Have the Toxic Substance Reduction Plan certified by an MOE licensed Toxic Substance Reduction Planner (the Planner) as well as the HRE at the Facility;
- Prepare Plan Summaries containing various components of the Toxic Substance Reduction Plan and make them available to the public;
- Submit annual reports on progress made on the Plans; and
- Update the Plans at least every five years.

The facility is captured by the requirements pertaining to the Toxic Substance since the Facility meets the TRA's definition of target facilities as it is classified by the North American Industry Classification System (NAICS) code 331529 (Non-Ferrous foundries – except die-casting) and also triggered the National Pollutant Release Inventory (NPRI) reporting threshold for the Toxic Substance.

As such, the Facility has completed Toxic Substance quantification, accounting, and reporting requirements under the TRA for the 2011 reporting year in accordance with s. 12 of O.Reg. 455/09, and this Plan satisfies the Toxic Substance Reduction Plan and Plan Summary preparation requirements of the TRA and O. Reg. 455/09.

2.0 Basic Facility Information

The following table is adapted from Appendix 3 of the MOE Planning Toolkit and provides the applicable Basic Facility Information stipulated in section 18(2) of O.Reg 455/09.

Mandatory Basic Facility Information Item	Details
Substance Name and Chemical Abstracts Service (CAS) Registry Number, if any	Lead CAS #: *No single CAS number* Antimony CAS #: 7440-36-0 Xylene CAS #: 1330 - 20 - 7 Ethyl Benzene CAS #: 100-41-4
NPRI Identification numbers	NPRI ID: 000000 - 4834
The legal and trade names of the owner and the operator of the facility, the street address of the facility, and the mailing address of the facility, if different.	Mr. Kevin Milne President. Mars Metal Company 4140 Morris Drive. Burlington, Ontario, Canada. L7L 5L6
The number of full time employee equivalents at the facility	Sixteen (16)
The two - and four-digit North American Industry Classification System (NAICS) codes and the six-digit NAICS Canada code	33 - Manufacturing 3315 - Foundries 331529 - Non-ferrous foundries (except die-casting)
Public Contact	Mr. Kevin Milne Operations Manager Mars Metal Specialty Castings (address per above) (905) 637-3862
Technical contact and person who is responsible for coordinating plan preparation	Mr. Kevin Milne (address per above)
The person who prepared the plan	Mr. Mark Wiedener - TSRP0255 Toxic Substance Reduction Planner Greenflow Environmental Services Inc. - 4151 Morris Drive, Burlington, ON L7L 5L5 (905) 333-3004
Highest ranking employee at the facility who has management responsibilities relating to the facility and who is responsible for making certification	Mr. Kevin Milne President - Marswell Metal Industries 4140 Morris Drive, Burlington, ON. L7L 5L6 (905) 637-3862
Parent Company Information	Marswell Metal Industries Ltd. 4140 Morris Drive Burlington, Ontario, Canada L7L 5L6

(905) 637-3862

3.0 Planner License Number

S.18(2) of O.Reg 455/09 (as amended by s.9(2) of O.Reg. 214/11), requires a licensed Toxic Substance Reduction Planner to provide planner recommendations on and to certify the plan. The certification of this plan is as follows:

Mark Wiedener

Sr. Environmental Technologist

Greenflow Environmental Services

Toxic Substance Reduction Planner License Number: TSRP

4.0 Statement of Intent and Objectives of The Plan

As required by s.4(1) of the TRA, a Plan must include a statement of the Facility's intent to reduce the use and/or creation of the Toxic Substance, or the Plan must state the reason why this is not feasible for the Facility to reduce the use and/or creation of the Toxic Substance.

This Plan will outline the Facility's current practices with respect to its use of the Toxic Substance and supports the Facility's position that no toxic substance reduction options can be identified, or implemented for the Toxic Substance at this current time.

4.1 Statement of Intent

A statement of the Facility's intent to reduce the use of the Toxic Substance has not been included as part of this Plan. The Toxic Substance is never created within the Facility's process and therefore no statement with respect to intent to reduce creation of the Toxic Substance is required.

The Toxic Substance has triggered reporting under the TRA and O.Reg 455/09 due to it being contained within the raw material that Mars Metal Company utilizes to create its finished product. There are 3 main "uses" of the Toxic Substance that take place within the facility; the first function, which can be defined as a "use", is the creation of the product by melting lead ingots, or large lead "pigs" in the melting furnaces. The second "use" of the Toxic Substance occurs when the melted lead is poured from one of the melting furnaces into a prefabricated mold where it is left to cool, and harden. As the lead hardens, it shrinks within the mold, leading to more small amounts of lead being added to the top of the mold. The final "use" of the raw material is in addition to the casting process; after the lead has hardened and has been removed from the mold, Mars Metals performs surface finishing on their products. Freshly cast products are subjected to surface grinding to remove any "burs", or inconsistencies, after which they may be coated with an epoxy resin and painted, although this can vary depending on the desire of the customer. As it is the

raw material, the purchase of the product that is used within the Facility which contains the Toxic substance is a significant capital expenditure and therefore optimizing the use of the product which contains the Toxic substance is in the Facility's best interest as it is directly related to cost control. Throughout the course of achieving the current level of process and practice optimization with respect to the Toxic Substance and considering the above aspects which influence the Facility's use of the toxic substance, the Facility has considered many options to reduce its use of the Toxic Substance and has already completed internal assessments of some initiatives which could constitute toxic substance reduction options that could otherwise be identified for the purposes of this Plan. Some of these initiatives are mentioned within this Plan, however, they have not been provided as toxic substance reduction options for the purposes of this Plan since they have previously been deemed not to be feasible or implemented. The sources of emissions include the three lead casting furnaces, the surface finishing area, and comfort heating.

Given the above information, the Toxic Substance flows through the Facility process without undergoing any chemical change and, due to its presence within the raw material, this Facility activity which the TRA has defined as a "use" of the Toxic Substance can only be reduced by reducing the Facility's overall level of production. However, Mars Metals is acutely aware of the dangers that the Toxic Substance presents to the natural environment, and will continue to evaluate all opportunities to minimize the potential release of the Toxic Substance to outside sources. Mars Metals is currently working with the Ministry of the Environment to update its Certificate of Approval to ensure that they are operating in a transparent fashion.

4.2 Objectives of the Plan

The objectives of this Plan are as follows:

- Provide support for the Facility's position with respect to the Statement of Intent of this Plan; and
- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

5.0 Toxic Substance Quantification, Accounting and Reporting Information

As required by s 12 of O.Reg 455/09, the Facility was required to fulfill its Toxic Substance quantification, accounting, and reporting (QAR) requirements for all reporting years to date. The following sections provide a description of how the Toxic Substance QAR exercise was completed and how each item under s. 12 of O.reg 455/09 were addressed. An Emissions Summary Dispersion Modeling Report was prepared for the casting, finishing, and comfort heating operations at the facility in order to quantify the emissions of the Toxic Substance to outside sources.

5.1 Description of Each Process That Uses the Toxic Substance

As stated elsewhere in this plan, the Toxic Substance reporting under the TRA and O.Reg 455/09 was triggered due to a few activities at the Facility which involve the use of the Toxic Substance as its raw material. These activities are:

Lead Casting Operation:

Mars Metal operates a lead casting process which melts lead ingots and pours them into pre-formed molds. There are a total of three furnaces, which can process 3500lbs (Furnace #1), 12000lbs (Furnace #2), and 12000lbs (Furnace #3) respectively. Mars Metal pours the lead to manufacture counterweights, radiation shielding bricks, and boat keels. Furnace #1 is used exclusively for brick and counterweight pouring, while Furnace #2 and Furnace #3 are used mainly for the pouring of boat keels. The composition of the lead is specified at the time of the order by the supplier, but is typically 95-96% lead composition, with the remaining 4-5% consisting of various elements. This composition of lead/trace elements is desirable, and is generally the industry standard, as it provides a certain luster, and density to meet the demands of the consumer.

Each furnace undergoes the following procedure for melting lead: The ingots (or “pigs”) which enter the facility in weights of 40lbs, 65lbs, or 1000lbs, are stored indoors in a holding area. When needed, they are transported via a fork-truck to the furnaces. The ingots (or “pigs”) are then loaded into the furnace pot and heated to 550-800 °F. Lead ingots take approximately 1-4 hours to melt depending on the furnace. When the ingots are being melted, the desired mold is moved into place at the base of the furnace and, in the case of the keels, secured to prevent any movement or deviation. Once the lead is ready to be poured, a pipe is lowered into the top of the mold and a valve is opened to allow for the flow of lead. To prevent unwanted clogging of the lead, an acetylene torch may be used to heat the pour pipe, as well as the lead mold itself. Once the mold is filled to the desired level, the top of the lead is skimmed to remove any dross or contaminants, and the mold is left to cool. A keel pour generally takes 5-10 minutes to complete. Over the next couple of hours, the top of the lead is re-melted with the acetylene torch and lead is added to compensate for the shrinkage in the mold that occurs.

The pouring of bricks occurs in an assembly line fashion. There are four stages: pouring the lead into the mold, cooling, addition of lead to compensate for shrinkage, removing the lead brick from the mold. Multiple molds are used simultaneously to keep the production moving in an efficient manner. At full production, an average of 60 bricks can be produced per hour of operation. Generally, when operating under normal conditions, one employee will pour bricks at a rate of 15-20 bricks per hour.

The emissions from the site are emitted into the atmosphere from two sources: a combined furnace/dross ventilation stack, and general ventilation from the Facility. Refer to Figure 1 for a schematic of the process. An ESDM report was prepared in order to track and quantify the emissions. The results of this report can be located in Figure 2.

Keel Finishing Operation:

Once the Lead cools overnight, the mold will be opened and the keel will be hung up in one of 3 rooms. Large curtains are used to contain any dust. During high production, 3 small keels can be completed per day by three employees. These keels generally weigh roughly 4000lbs; larger keels can take 2-3 days to complete depending on the required finishes as determined by the customer. Four stages are required to finish a keel: grinding, coating, sanding, and painting. Each process creates a unique set of contaminants which are dealt with accordingly. The SDS sheets for each product can be found at the end of the Plan, within the supporting documents section.

An electric grinder is used to remove any protruding imperfections from the keel. This includes any rough edges or “burs”, especially along the seams of the mold. The large lead grindings fall to the ground and are swept up and disposed of in UN approved containers, and stored on pallets in the shipping area. These drums will then be shipped back to the ingot supplier to be smelted into new lead pigs. Grinders and sanders are connected to a centralized Nilfisk CFM 127 industrial vacuum. The air stream is pulled through a HEPA filter and re-delivered to the Facility. Grinding and sanding can take anywhere between 1-8 hours, depending on the desired finish. Emissions from these operations can be considered negligible as the size and density of the particles, which are not captured in the vacuum system, prevent them from becoming airborne. This allows the larger particles to settle at the ground level where they can be recovered.

Comfort Heating:

Mars Metal’s Burlington operation includes two buildings located adjacent to each other, the general office/warehouse building and the manufacturing building. Both buildings include space heaters in the larger, open spaces, and an HVAC unit for the offices. The below table is a summary of the comfort heating units and their respective fuel input ratings.

Comfort Heating Units	
Type of Unit	Input Rating (Btu/hr)
Office/Warehouse Building	
HVAC Unit	74,000
Heater 1	35,000
Heater 2	70,000
Furnace	80,000
Manufacturing Building	
Radiant Heater 1	125,000
Radiant Heater 2	125,000
Radiant Heater 3	75,000
Radiant Heater 4	75,000
Radiant Heater 5	75,000

Radiant Heater 6	75,000
Total	809,000

Since the total Btu/hr rating for both building is below 18.9 MMBtu/hr, the comfort heating emissions can be considered negligible as per Table B.3 from the “Procedure for Preparing an ESDM Report”. They also fall below the 1.5 MMBtu/hr minimal rating required to register with EASR. With respect to this information, the Facility still took steps to try to track and quantify the presence of the Toxic Substance within this portion of its operations.

5.1.1 Records of Identification and Description of Stages and Processes of Facility Operation and Record Containing Process Flow Diagrams

Per guidance provided in the Accounting Toolkit, two PFDs, with a focus on the different Toxic Substances, have been provided as part of the Toxic Substance QAR exercise to give a visual representation of the movement of the Toxic Substance through every stage of the process where it is present and to show the relationships between the processes.

Stages and Process Overview Diagram

The “Stages and Processes Overview Diagram” provides descriptions, in general terms, of every stage of the Facility where the Toxic Substance is present. Refer to Figure 1 at the end of this Plan titled – Stages and Processes Overview Diagram

Process Flow Diagram

The PFD provides the appropriate level of detail to satisfy s. 12 of O. Reg. 455/09. It demonstrates how each stage where the Toxic Substance is present has been broken down into a sufficient number of individual processes to satisfy s.12(3) of O. Reg. 455/09. The PFD includes the following:

- The amount of the Toxic Substance that enters the process
- The amount of the Toxic Substance that is destroyed or transformed; and
- Any NPRI-reportable releases of the Toxic Substance

It should be noted that the Toxic Substance is never created within the Facility process and therefore no quantifications are required for an amount of Toxic Substance created.

5.2 Toxic Substance Accounting Information

5.2.1 Quantifications at the Process Level

Toxic Substance Quantifications are also provided in Figure 2. This information is provided on the “Calculations, Emissions Analysis and Summary” page. The following information has been included:

- A description of the quantification method;
- A rationale for selecting each quantification method;
- Data used to quantify the activity;
- Data quality for the quantification; and
- Sample calculation.

The emissions from the Facility were calculated based off a stack sampling exercise that was contracted to Adomait Environmental Solutions Inc. The sampling program was performed under Ministry of Environment (MOE) guidance and followed USEPA Method 29 ‘Determination of Metals Emissions from Stationary Sources’.

To determine the validity of the sampling program, the highest maximum production for Mars Metal had to be determined. Through discussions with the MOE, it was determined that the highest emission rates occur with large exposed surface area. As such, pouring a larger keel did not increase the emissions to the degree that pouring a larger quantity of bricks did. Sampling was therefore performed under the three (3) following scenarios:

- Pouring of ~8000 lbs keel and a constant production of bricks;
- A constant production of bricks alone; and
- One ambient condition test.

The sampling program occurred under the maximum production ability of the equipment. Normal operation of the plant occurs at approximately 20% of the maximum production. Emission rates were calculated based on the maximum production of the equipment and are considered very conservative. The average results of the sampling exercise, as well as the emission rate calculations can be located in Figure 2 at the end of this Plan.

5.2.2 Records of Methods and Rationale for Selecting each Method used to Track and Quantify the Toxic Substance

As required by s. 12(6) of O. Reg 455/09, for each quantification method that was used to prepare process-level quantifications, a rationale for why the method was identified as the best available for the purpose of completing the exercise provided. In the process of identifying best available methods, the Facility used judgment based on relevance and effort required to obtain information and feels that it has gone to reasonable efforts in identifying and applying the best available methods for quantifications and collecting the information necessitated by the quantification method.

The facility understands that methods used to complete the Toxic Substance QAR exercise can only be changed under the circumstances stipulated in s. 12(7) of O. Reg. 455/09. At this time, the Facility does not intend to change the quantification methods that were used

to complete the Toxic Substance QAR exercise for the purpose of completing the Toxic Substance QAR exercises for subsequent years. For the purposes of this Plan, the facility conducted a source testing program between August 15th, and August 24th of 2011. An ESDM report was prepared, and serves as a guidance document when deriving calculations pertaining to the Toxic Substances within the facility during its processes.

Methodology

Atmospheric dispersion modeling was carried out to assess the impact of the combined emissions from the facility using the AERMOD software modeling package. According to O. Reg. 419/05, the use of this model is appropriate for Schedule 3 criteria. The NAICS code for a primary production metals casting facility is 331529, thus the facility falls under Schedule 3 of O. Reg. 419/05.

Dispersion modeling was performed using AERMOD to determine the maximum point of impingement (POI) concentrations for each source.

6.0 Estimate of Direct and Indirect Annual Costs Associated with the Toxic Substance

As required by s. 18(1) of O. Reg. 455/09, direct and indirect costs have been estimated for the Toxic Substance. In preparing cost estimates, several departments at the Facility were consulted. Cost items associated with the toxic substance were identified and fit into the following categories:

- Raw Materials; and
- General Facility Costs

The cost estimates along with comments are provided in Appendix A – Estimate of Direct and Indirect Annual Costs associated with the Toxic Substance.

O. Reg. 455/09 does not specify the level of detail to which a Facility must examine costs associated with a toxic substance, however, the Facility feels that it has gone to reasonable lengths in its efforts to estimate the costs associated with the Toxic Substance.

7.0 Options Considered for Reduction

S. 17 of O. Reg. 455/09 outlines the requirements for identification of toxic substance reduction options and provides the seven categories of toxic substance reduction options under which options are to be identified as part of the Plan.

7.1 Identification of Toxic Substance Reduction Options in Each of Seven Toxic Substance Reduction Categories

With the assistance of a licensed Toxic Substance Reduction Planner, Facility personnel have considered each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent, the Facility feels that it is impossible to reduce its use of the Toxic Substances without reducing production, and therefore, no toxic substance reduction options can be identified in any of the seven substance reduction categories.

It is not necessarily a requirement under O. Reg 455/09 to provide toxic substance reduction options, however s. 17(2) of O.Reg. 455/09 states that the following must be provided in the event that an option for toxic substance reduction cannot be identified in any of the seven toxic substance reduction categories.

“17(1)2. If an option cannot be identified for a category listed in paragraph 1, an explanation of why no options could be identified for the category”

Based on the information provided in the Statement of Intent section of this Plan, regarding activities at the Facility which meet the TRA's definition of use of the Toxic Substance, Marswell Metal Industries finds itself in a situation where options for reductions in the “use” of Toxic Substances cannot be identified under the TRA's framework. Therefore, no toxic substance reduction options have been identified in any of the seven Toxic Substance reduction categories.

7.1.1 Materials and Feedstock Substitution

Substitution has been investigated as a potential Toxic Substance reduction option. At this point in time, sailing keels are commonly made from three different materials; Lead – as is the case at Marswell Metal Industries, Iron, and a concrete cast encased in fiberglass. When comparing the trade-offs between the different types of keels, Lead keels are generally accepted by the industry as being the far superior option. The density of lead allows for a keel which has been manufactured using this substance to outperform keels that have been manufactured using Iron, or concrete at a functional level. The keels that are manufactured using lead also tend to take longer to degrade in seawater, and tend not to affect the structural integrity of the boat itself when degradation does occur. Similarly, concrete/fiberglass keels tend to not have the durability afforded by lead when used in these applications. Therefore, it is the position of Marswell Metal Industries, that in order to substitute the Toxic Substance, with another substance, a significant degradation in the quality of the product would need to occur, which would be detrimental to the business. The Facility also feels that the minimum possible amount of the Toxic Substance is utilized in order to manufacture each product. All other products manufactured at the Facility also fit into the industry standard in their respective industries.

7.1.2 Product Design or Reformulation

It is the opinion of Marswell Metal Industries that the single-piece casted lead ballast is at the pinnacle of quality to the end user, and is generally accepted as being the industry standard procedure for manufacturing such an item. As mentioned earlier, changing the composition of Toxic Substance within the raw materials would be problematic for the end

user, as specifications need to be met in order to address a specific size, orientation, or shape. Similarly, the density of the Toxic Substance, when used for this purpose, is demanded within the industry.

7.1.3 Equipment or Process Modification

The Facility has executed many initiatives involving modifications or processing steps to ensure that maximum possible efficiency is maintained. Furnace efficiency was identified as a possible area that Marswell Metal Industries was looking to reduce the use and dispersion of the Toxic Substance. Regenerative burners for the furnace were identified, but currently, are not offered in a size that is compatible with the furnaces located in the Facility. The Facility will continue to monitor this as an option, to see if an adequate size ever becomes available to market. Also, the Facility looked into heat recuperation by way of the addition of a heat exchanger to a stack in order to push pre-heated air across the burners, resulting in less gas being used and, therefore, a more efficient process.

7.1.4 Spill and Leak Prevention

The Facility has maintained an on-going and open review of the current practices within the facility. The Facility constantly strives to ensure that current spill and leak prevention measures are in alignment with the industry standard, which leads to constant exchanges of information between the Facility, and their suppliers and vendors. It is the opinion of the Facility that the current measures in place are in alignment with the expectations of the MOE.

7.1.5 On-site Reuse or Recycling

The majority of the toxic substance is contained in the finished product. The remaining particles from the grinding process are swept up and sent back to the ingot supplier in order to be re-smelted into new lead pigs. The Facility is of the opinion that this is not a feasible option as it would require a considerable amount of change to the facilities processes. This process would also require the facility to seek approvals that could be quite costly.

7.1.6 Improved Inventory Management or Purchasing Techniques

The Facility feels that the current purchasing practices are in line with maintaining the minimum amount of the Toxic Substance on site in order to accomplish a specific order. Typically, ordering occurs at the beginning of every month when workload for that timeframe has been determined.

7.1.7 Training or Improved Operating Practices

The Facility feels that it takes exceptionally prudent measures with regard to the health and safety of its employees. The operations department has developed detailed training procedures relating to various operations throughout the Facility. Employees are

subjected to mandatory health and safety training, where they are briefed on the importance of personal protective equipment and their relation to the Toxic Substance. Employees are also subjected to mandatory blood testing every four (4) months - at the expense of the Facility - in order to determine the lead levels present within their blood. The Facility monitors these tests consistently and has procedures in place by which to take action should an employee's blood lead levels approach the threshold that the Facility has deemed unacceptable. It is the opinion of the Facility that their training and operating practices exceed the industry standard and result in a robust system that is optimized using the best available technology and practices that are economically achievable at this time. In light of the aforementioned information it is therefore the opinion of the Facility that no toxic substance reduction options have been identified under the toxic substance category "Training or Improved Operating Practices".

7.2 Estimates of Potential Reductions Associated with Each Identified Toxic Substance Reduction Option

As mentioned in s. 7.1.3 of this Plan, the facility was able to establish options for increasing the efficiency to their existing furnaces. The Facility was able to estimate, on the advice of the manufacturer of the facilities furnaces, that the addition of a heat exchange unit to one of its furnaces could result in a maximum of a 10% decrease in energy used for the furnace that took on the addition. As there is currently no model of regenerative burner that is in a size compatible with the Facility's furnaces, this option was not reviewed further.

7.3 Identification of Technically Feasible Options

As mentioned in s 7.1.3 of this plan the Facility has identified the addition of a heat exchange unit to its furnaces as an option to reduce the energy demand of each furnace outfitted with the unit by a maximum of 10%. No other technically feasible options were established in any of the other six Toxic Substance reduction categories.

7.4 Identification of Economically Feasible Options

The manufacturer of the Facility's furnaces estimated that the cost of the addition of a heat exchange unit would be roughly \$200,000 after installation. This was simply not economically feasible as the Facility cannot justify such a large capital expenditure for such a marginal reduction in energy usage. No other economically feasible options were established for any of the other six Toxic Substance reduction categories.

8.0 Rationale for not Implementing Toxic Substance Reduction Options

As required by s. 18(4) of O. Reg. 455/09 (as amended by s.9(3) of O.Reg. 214/11), a Plan must contain an explanation of why no toxic substance reduction options will be implemented.

Facility personnel have carefully examined each of the seven categories for toxic substance reduction options and, in light of the information provided in the Statement of Intent section of this Plan, the Facility feels that no toxic reduction options can be identified in any of the seven toxic substance categories that were deemed economically feasible at this time.

Therefore the rationale for not implementing toxic substance reduction options is that no reasonable, or feasible toxic substance reduction options could be identified.

9.0 Planner Recommendations and Rationale

As required by s. 18.2 of O. Reg 455/09 (as amended by s. 10 of O. Reg 214(11), the Facility provided a draft copy of the Plan to a licensed Toxic Substance Reduction Planner for the purpose of obtaining recommendations with respect to the plan. It should be noted that implementation of Planner Recommendations is not a requirement of O. Reg. 455/09 or the TRA.

A document addressing requirements pertaining to recommendations by a planner under s.18.2 of O. Reg 455/09 is provided in Appendix B – Planner Recommendations and Rationale.

10.0 Plan Summary

As required by s. 8 of the TRA, a Plan Summary in accordance with s. 23 of O. Reg 455/09 is included in Appendix C – Plan Summary. Information contained in the Plan summary has been provided to the MOE through the “Single Window” reporting system.

Additionally, the Plan Summary is available on Marswell Metal Industries’ website and can be provided to a member of the public upon written request. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

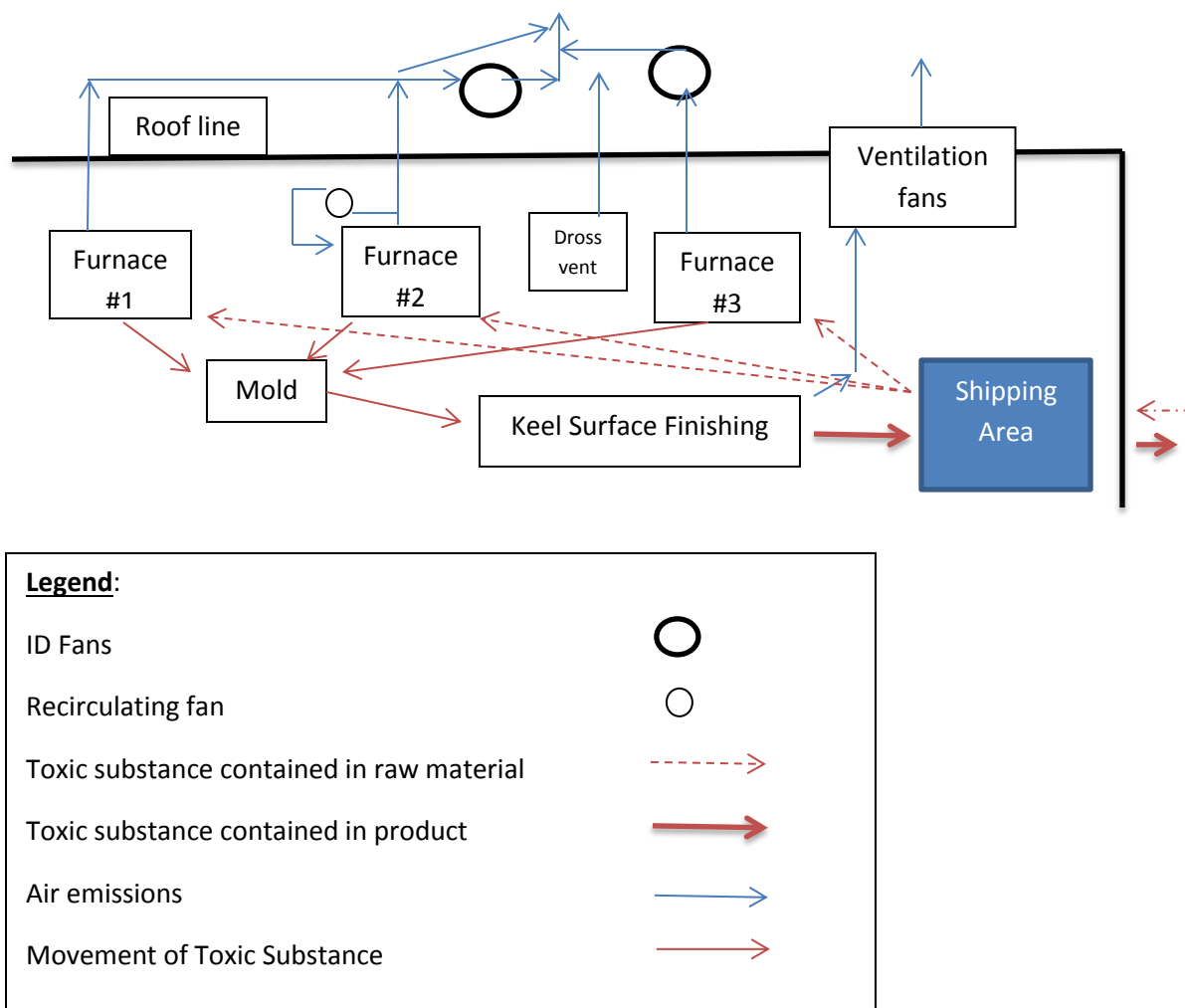
11.0 Certifications

In spite of the Facility’s best efforts, it was unable to complete the requirements of the TRA before the deadline of December 31st, 2012. As a result, and in accordance with the TRA, this plan falls outside compliance in that regard and therefore cannot be certified as such.

In this situation, the MOE has recommended that the Toxic Substance Reduction Planner should confirm in writing, with signature, that s/he is familiar with the processes at the facility, agrees with the estimates of reduction (if any) for those options that will be implemented (if any) and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

The highest ranking employee should provide a rationale as to why the December 31st, 2012 deadline was not met. In addition, s/he should confirm in writing, with signature, that s/he has read the plan, is familiar with its contents and, to his/her knowledge, the plan is factually accurate and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

These confirmation statements have been attached at the end of this Plan as Appendix D – Confirmation Statements from the Planner and Highest Ranking Employee.

Figure 1 – Stages and Processes Overview Diagram


Furnaces 1, 2, and 3 are rated at 0.30, 1.6, and 1.03 MMBtu/hr respectively. The furnaces are similar except for a few variations. Furnace 2 has a recirculating fan which takes the exhaust gas from the furnace and directs a portion of the gas across the exit of the unit. Gases travel up the stack mainly by convection. Gases from furnaces 1 and 3 are drawn by separate ID fans and delivered to the common header on the roof. Potential contaminants from this process were defined by USEPA AP-42 and, for the purposes of this Plan, include: antimony, and lead.

Process Flow Diagram (PFD):

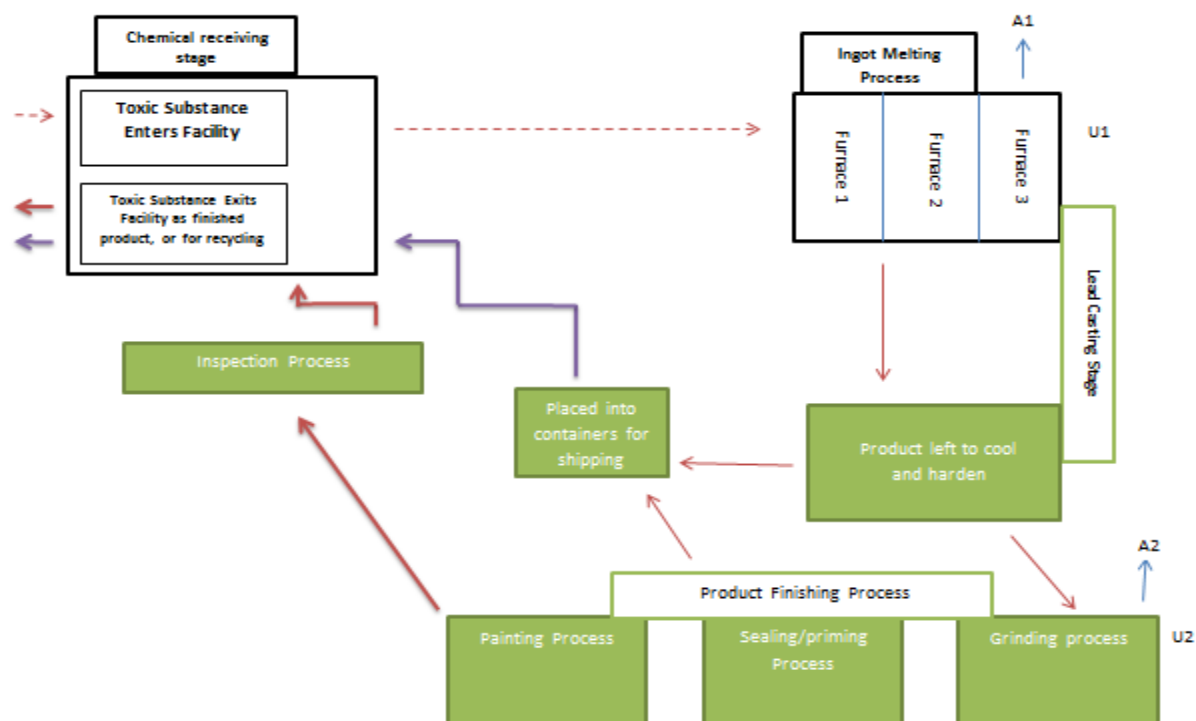
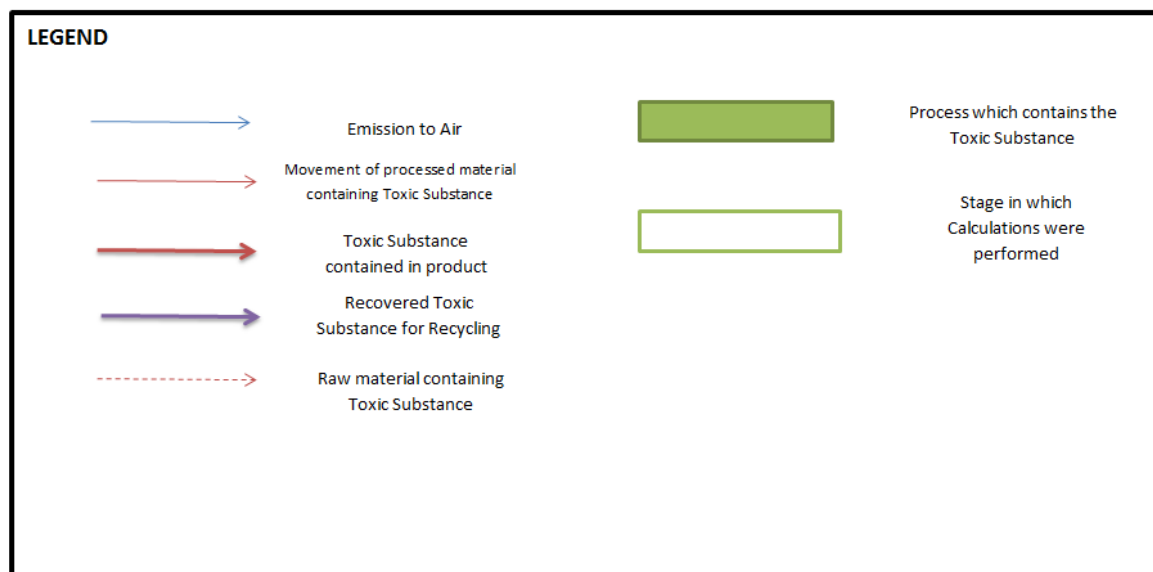


Figure 2 – Calculations, Emissions Analysis and Summary s.

5.2.1

Table 1: Summary of Brick Pouring Emissions			
	Average		
Average Temp (°C) (°F)	31.77 (°C) 89.19 (°F)		
Flow Rate (ft ³ /s) (m ³ /s)	165.91 (ft ³ /s) 4.70 (m ³ /s)		
Actual Flow Rate (m ³ /s)	2.89		
Moisture (%)	1.94		
% Iso	100.89		
Parameter	Blank Capture (mg)	Conc. (mg/m ³)	Emission Rate (mg/s)
Lead	0.0019	0.20	0.92

Table 2: Summary of Brick and Keel Pouring Emissions			
	Average		
Average Temp (°C) (°F)	39.84 (°C) 103.71 (°F)		
Flow Rate (ft ³ /s) (m ³ /s)	163.69 (ft ³ /s) 4.64 (m ³ /s)		
Actual Flow Rate (m ³ /s)	2.90		
Moisture (%)	1.54		
% Iso	N/A		
Parameter	Blank Capture (mg)	Conc. (mg/m ³)	Emission Rate (mg/s)
Lead	0.0019	0.27	1.25

Table 3: Summary of Furnace Stack Emissions			
	Average		
Average Temp (°C) (°F)	166.09 (°C) 330.97 (°F)		
Flow Rate (ft ³ /s) (m ³ /s)	19.16 (ft ³ /s) 0.54 (m ³ /s)		
Actual Flow Rate (m ³ /s)	0.49		
Moisture (%)	3.61		
% Iso	N/A		
Parameter	Blank Capture (mg)	Conc. (mg/m ³)	Emission Rate (mg/s)
Lead	0.0019	0.98	0.53

Emission Calculations

The previous three tables were derived from a stack sampling exercise described in s 5.2.1 of this plan. When performing the stack sampling exercise, the “worst case” production scenario was attempted to be duplicated. This exercise was performed under the assumption of all three of the Facility’s furnaces operating at maximum efficiency. The Facility also took measures to track the use of the furnaces across the year in order to develop a baseline by which to utilize the emissions report to calculate the actual emissions rate of the Facility. The operating hours were viewed as follows:

- Furnace #1: 1 day/week, full day – 8 hours
- Furnace #2: 2 days/week, full day – 8 hours per day
- Furnace #3: Special circumstances only as described below.

Furnace 3 is generally only used for tall keel pouring and, when it is in use, furnace 2 is generally off. The one day a week Furnace #1 is in operation would overlap with furnace 2, or 3 (depending on which is in use), and under no circumstances would it produce bricks or pours for the entire duration of an 8 hour day similar to the scenario utilized for testing (50-60 bricks per hour for 8 hours). As described in the process description, it is generally witnessed that one worker can pour 15-20 bricks per hour for 5, or 6 hours in a day. Also, the only occasion that furnaces 2 and 3 would be in operation at the same time occurs during the pouring of very large keels. Typically, this occurs 2 times a year, for a full 8 hour work day, and furnace #1 is never in operation at the same time due to the labor demand required for such an operation.

In light of the above information, the actual operation hours witnessed during the year were found to be 1,152 furnace operating hours. Since the sampling exercise was conducted at full production, and assumed a constant level of production at that scale, it is concluded that the exercise can be applied to a scenario in which there were assumed to have been 5,760 furnace operating hours (48 working weeks x 5 day work week x 3 furnaces).

Given this information, it can be viewed that the Facility operates at roughly 20% of the worst case scenario:

$$\text{Relative production levels} = \frac{\text{Expected furnace operating hours}}{\text{Actual furnace operating hours}}$$

Therefore, an estimate of the actual emissions can be calculated as follows.

$$\text{**Actual Emissions} = \# \text{ of actual furnace operating seconds} \times (\text{emissions from Keel and Brick pouring} + (1/2 \text{ furnace emissions})) \times \text{Conversion factors (mg/s} = \text{kg/year)}$$

** Furnace emissions quantified as 50% as a conservative estimate from the above information concerning actual furnace operating hours**

= 4,147,200s x (1.52 mg/s)

= 6,303,744 mg/s

Multiply by conversation factors mg = kg

= 6.303 kg/year

Appendix A - Estimate of Direct and Indirect Annual Costs associated with the Toxic Substance.

S. 18(1) of O. Reg. 455/09 requires that direct and indirect costs be estimated for the Toxic Substance for which the Plan is being prepared. A Facility has the flexibility to determine how and to what level of detail to calculate direct and indirect costs. The MOE indicates that an understanding of direct and indirect costs associated with a prescribed toxic substance will assist the Facility in assessing the economic feasibility of identified toxic substance reduction options.

The table below, which contains information provided by Facility personnel, provides categories descriptions and associated costs that may be associated with the Toxic Substance and provides an appropriate level of detail for this cost estimating exercise.

Costs			
Cost Category	Cost Item Description	Cost	
		Lead	Antimony
Raw Material	Lead ingots/pigs	\$2,400,000	\$134,440.74
General Facility Costs	HVAC maintenance, PPE, testing	\$71, 158.44	\$3, 735.81

Appendix B: Planner Recommendations and Rationale



TECHNICAL MEMORANDUM

Greenflow Environmental Services (Greenflow) was retained by Marswell Metal Industries Ltd. (the Facility) to provide various services pertaining to Phase I Toxic Substance Reduction Plan preparation under the *Toxic Reduction Act* (TRA), including Toxic Substance Reduction Planner Recommendations (Planner Recommendations).

As required by s. 18.2 of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 10 of O. Reg. 214/11), a facility is required to provide a draft copy of the Plan to a licensed Toxic Substance Reduction Planner (the Planner) for the purpose of obtaining recommendations with respect to the Plan. This document fulfills the requirements of s. 18.2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) for the draft document entitled "Toxic Substance reduction Plan – Lead Version 1.0" (the Plan) which has been prepared for the prescribed toxic substance referred to as Lead (the Toxic Substance).

Planner Recommendation Requirements Under the TRA and O. Reg. 455/09

Section 18.2(3) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) provides the areas of a given Plan in which Planner Recommendations are required to be documented (the Areas of Recommendation). As required by s. 18.2(4) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11), a Planner must also provide a rationale for each Planner Recommendation. Implementing the Planner Recommendations (if any) is voluntary.

As stated in s. 18.2(2) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11), Planner Recommendations shall be provided for the purpose of improving all aspects of the Plan, including:

- The potential for reducing the use and creation of the toxic substance at the facility; and
- The business rationale for implementing the Plan.

S. 18.2(5) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) a Planner must provide a written explanation if the Planner is of the opinion that no recommendations are necessary with respect to any of the Areas of Recommendation.

Written Explanation for No Necessary Recommendations

The Planner is of the opinion that no recommendations are necessary with respect to any of the Areas of Recommendation within the Plan.

The following written explanation is being provided by the Planner to the Facility under s. 18.2(5) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) and satisfies the Facility's requirements for Planner Recommendations under s. 18.2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) pertaining to the Plan for the Toxic Substance:

Greenflow Environmental Services Inc.
 2400 Main Street
 Burlington, Ontario, Canada
 L7R 4A1
 (905) 687-5400



TECHNICAL MEMORANDUM

It is the opinion of the Planner that no recommendations are necessary with respect to any of the categories listed within paragraphs 1-6 of s. 18.2(3) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) for the Plan. The rationale being, after completing the TRA exercise for the Toxic Substance, the Facility is of the opinion that the Facility finds itself in a situation where options for reductions in its "use" of the Toxic Substance cannot be identified under the framework of the TRA. No obvious feasible toxic substance reduction options were revealed by undertaking the TRA exercise with respect to the Toxic Substance. With this information in mind, the Facility has not included within the Plan a statement of its intent to reduce its use of the Toxic Substance under the framework of the TRA. The Planner and the Facility feel that there is little value in providing Planner Recommendations on a Plan that the Planner feels is compliant, aside from the absent certification statements, and addresses all matters within the framework of the TRA and O. Reg. 455/09 for a substance whose use the Facility does not intend to reduce.

Closing Statement

This document provides the correct records required to satisfy s. 18, 2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) with respect to the draft Plan. It is recommended that a copy of this document be appended to the final version of the Plan.

Sincerely,

Greenflow Environmental Services Inc.



Mark Wiedener
Toxic Substance Reduction Planner
License No. T5R0255

Greenflow Environmental Services Inc.
2011 Main Street
North York, Ontario, Canada
M2H 1B5
(416) 267-5443

Appendix C: Plan Summary

This Toxic Substance Reduction Plan Summary has been prepared in accordance with Section 8(2) of the *Toxics Reduction Act* and satisfies the minimum Plan Summary content requirements stipulated in Section 24 of Ontario Regulation (O. Reg.) 455/09

Basic Facility Information

Mandatory Basic Facility Information	Details
Substance Name and Chemical Abstracts Service (CAS) Registry Number for the Substance(s) whose Toxic Substance Reduction Plans are summarized by this Plan Summary	Lead (per O. Reg. 455/09 “no single CAS number applies to these substances”)
National Pollutant Release Inventory (NPRI) Number	NPRI Id: 000000 - 4834
Legal and Trade names of the owner and the operator of the facility, street address of facility, and mailing address of facility if different	Marswell Metal Industries Ltd. 4140 Morris Drive. Burlington, Ontario, Canada L7L 5L6
Number of Full Time employee equivalents	16
Two-and four-digit North American Industry Classification System (NAICS) codes and the six-digit NAICS Canada code	33 – Manufacturing 3315 – Foundries 331529 – Non-ferrous foundries (except die-casting)
Public Contact	Mr. Kevin Milne Operations Manager Mars Metal Specialty Castings (address per above) (905) 637-3862
Spatial coordinates of facility expressed in UTM	UTM Zone 17 598835.24 E, 4802426.54 N
Parent Company Information	Marswell Metal Industries Ltd.

4140 Morris Drive Burlington, Ontario, Canada L7L 5L6 (905) 637-3862
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List of All Substances for which Toxic Substance Reduction Plans Have Been Prepared at the Facility

The Facility has prepared Toxic Substance Reduction Plans for the following prescribed Toxic Substances:

- Lead *
- Antimony *
- Xylene (CAS number 1330-20-7)
- Ethyl Benzene (CAS number 100-41-4)

* = No single CAS number applies to these substances as per O. Reg. 455/09

Statement of Intent

A statement of the Facility's intent to reduce the use of the Toxic Substance has not been included as part of this Plan. The Toxic Substance is never created within the Facility's process and therefore no statement with respect to intent to reduce creation of the Toxic Substance is required.

The Toxic Substance has triggered reporting under the TRA and O.Reg 455/09 due to it being contained within the raw material that Mars Metal Company utilizes to create its finished product. There are 3 main "uses" of the Toxic Substance that take place within the facility; the first function, which can be defined as a "use", is the creation of the product by melting lead ingots, or large lead "pigs" in the melting furnaces. The second "use" of the Toxic Substance occurs when the melted lead is poured from one of the melting furnaces into a prefabricated mold where it is left to cool, and harden. As the lead hardens, it shrinks within the mold, leading to more small amounts of lead being added to the top of the mold. The final "use" of the raw material is in addition to the casting process; after the lead has hardened and has been removed from the mold, Mars Metals performs surface finishing on their products. Freshly cast products are subjected to surface grinding to remove any "burs", or inconsistencies, after which they may be coated with an epoxy resin and painted, although this can vary depending on the desire of the customer. As it is the raw material, the purchase of the product that is used within the Facility which contains the Toxic substance is a significant capital expenditure and therefore optimizing the use of the product which contains the Toxic substance is in the Facility's best interest as it is directly related to cost control. Throughout the course of achieving the current level of process and practice optimization with respect to the Toxic Substance and considering the above aspects which influence the Facility's use of the toxic substance, the Facility has considered many options to reduce its use of the Toxic Substance and has already

completed internal assessments of some initiatives which could constitute toxic substance reduction options that could otherwise be identified for the purposes of this Plan. Some of these initiatives are mentioned within this Plan, however, they have not been provided as toxic substance reduction options for the purposes of this Plan since they have previously been deemed not to be feasible or implemented. The sources of emissions include the three lead casting furnaces, the surface finishing area, and comfort heating.

Given the above information, the Toxic Substance flows through the Facility process without undergoing any chemical change and, due to its presence within the raw material, this Facility activity which the TRA has defined as a “use” of the Toxic Substance can only be reduced by reducing the Facility’s overall level of production. However, Mars Metals is acutely aware of the dangers that the Toxic Substance presents to the natural environment, and will continue to evaluate all opportunities to minimize the potential release of the Toxic Substance to outside sources. Mars Metals is currently working with the Ministry of the Environment to update its Certificate of Approval to ensure that they are operating in a transparent fashion.

Objectives of the Toxic Substance Reduction Plan

The objectives of this Plan are as follows:

- Provide support for the Facility’s position with respect to the Statement of Intent of this Plan; and
- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

Description of Why the Toxic Substance is Used or Created

As stated elsewhere in this plan, the Toxic Substance reporting under the TRA and O.Reg 455/09 was triggered due to a few activities at the Facility which involve the use of the Toxic Substance as its raw material. These activities are:

Lead Casting Operation:

Mars Metal operates a lead casting process which melts lead ingots and pours them into pre-formed molds. There are a total of three furnaces, which can process 3500lbs (Furnace #1), 12000lbs (Furnace #2), and 12000lbs (Furnace #3) respectively. Mars Metal pours the lead to manufacture counterweights, radiation shielding bricks, and boat keels. Furnace #1 is used exclusively for brick and counterweight pouring, while Furnace #2 and Furnace #3 are used mainly for the pouring of boat keels. The composition of the lead is specified at the time of the order by the supplier, but is typically 95-96% lead composition, with the remaining 4-5% consisting of various elements. This composition of lead/trace elements is desirable, and is generally the industry standard, as it provides a certain luster, and density to meet the demands of the consumer.

Each furnace undergoes the following procedure for melting lead: The ingots (or “pigs”) which enter the facility in weights of 40lbs, 65lbs, or 1000lbs, are stored indoors in a holding area. When needed, they are transported via a fork-truck to the furnaces. The ingots (or “pigs”) are then loaded into the furnace pot and heated to 550-800 °F. Lead ingots take approximately 1-4 hours to melt depending on the furnace. When the ingots are being melted, the desired mold is moved into place at the base of the furnace and, in the case of the keels, secured to prevent any movement or deviation. Once the lead is ready to be poured, a pipe is lowered into the top of the mold and a valve is opened to allow for the flow of lead. To prevent unwanted clogging of the lead, an acetylene torch may be used to heat the pour pipe, as well as the lead mold itself. Once the mold is filled to the desired level, the top of the lead is skimmed to remove any dross or contaminants, and the mold is left to cool. A keel pour generally takes 5-10 minutes to complete. Over the next couple of hours, the top of the lead is re-melted with the acetylene torch and lead is added to compensate for the shrinkage in the mold that occurs.

The pouring of bricks occurs in an assembly line fashion. There are four stages: pouring the lead into the mold, cooling, addition of lead to compensate for shrinkage, removing the lead brick from the mold. Multiple molds are used simultaneously to keep the production moving in an efficient manner. At full production, an average of 60 bricks can be produced per hour of operation. Generally, when operating under normal conditions, one employee will pour bricks at a rate of 15-20 bricks per hour.

The emissions from the site are emitted into the atmosphere from two sources: a combined furnace/dross ventilation stack, and general ventilation from the Facility. Refer to Figure 1 for a schematic of the process. An ESDM report was prepared in order to track and quantify the emissions. The results of this report can be located in Figure 2.

Keel Finishing Operation:

Once the Lead cools overnight, the mold will be opened and the keel will be hung up in one of 3 rooms. Large curtains are used to contain any dust. During high production, 3 small keels can be completed per day by three employees. These keels generally weigh roughly 4000lbs; larger keels can take 2-3 days to complete depending on the required finishes as determined by the customer. Four stages are required to finish a keel: grinding, coating, sanding, and painting. Each process creates a unique set of contaminants which are dealt with accordingly. The SDS sheets for each product can be found at the end of the Plan, within the supporting documents section.

An electric grinder is used to remove any protruding imperfections from the keel. This includes any rough edges or “burs”, especially along the seams of the mold. The large lead grindings fall to the ground and are swept up and disposed of in UN approved containers, and stored on pallets in the shipping area. These drums will then be shipped back to the ingot supplier to be smelted into new lead pigs. Grinders and sanders are connected to a centralized Nilfisk CFM 127 industrial vacuum. The air stream is pulled through a HEPA filter and re-delivered to the Facility. Grinding and sanding can take anywhere between 1-8 hours, depending on the desired finish. Emissions from these operations can be

considered negligible as the size and density of the particles, which are not captured in the vacuum system, prevent them from becoming airborne. This allows the larger particles to settle at the ground level where they can be recovered.

Comfort Heating:

Mars Metal's Burlington operation includes two buildings located adjacent to each other, the general office/warehouse building and the manufacturing building. Both buildings include space heaters in the larger, open spaces, and an HVAC unit for the offices. The below table is a summary of the comfort heating units and their respective fuel input ratings.

Rationale for Not Implementing Toxic Substance Reduction Options

As required by s. 18(4) of O. Reg. 455/09 (as amended by s. 9(3) of O. Reg. 214/11), a Plan must contain an explanation as to why no toxic substance reduction options will be implemented

Facility personnel have considered each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent section of this Plan, the Facility feels that no toxic substance reduction options can be identified in any of the seven toxic substance reduction categories.

Therefore, the rationale for not implementing toxic substance reduction options is that no toxic substance reduction options could be identified.

Statement that the Plan Summary Accurately Reflects the Current Version of the Plan

As required by s. 24(1)8 of O. Reg. 455/09 this Plan Summary accurately reflects the current version of the Plan.

Planner License Number

As required by s. 18(2) of O. Reg. 455/09 (as amended by s. 9(2) of O. Reg. 214/11), the Licensed Toxic Substance Reduction Planner responsible for providing Planner recommendation on and confirmation of this Plan as follows:

Mark Wiedener
Co-Owner/Vice President
Greenflow Environmental Sciences Inc.
Toxic Substance Reduction Planner License Number TSRP0255

Copies of the Confirmation

In lieu of the certification statements, this Plan has included confirmation statements which are provided on the following page.

Appendix D: Confirmation Statements



TECHNICAL MEMORANDUM

May 28, 2013

Mark Wiedener
Greenflow Environmental Services Inc.

LICENSED TOXIC SUBSTANCE REDUCTION PLANNER CERTIFICATION STATEMENT FOR PHASE I TOXIC SUBSTANCE REDUCTION PLANS FOR MARSWELL METAL INDUSTRIES LTD, INCLUDING ITS DIVISIONS MARSKEEL, MARS METAL SPECIALTY CASTINGS.

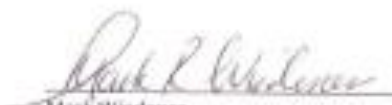
Dear Mr. Milne,

Greenflow Environmental Services Inc. (Greenflow) was engaged by Marswell Metal Industries Ltd. (the Facility) to provide guidance pertaining to Phase I Toxic Substance Reduction Plan preparation under the Toxic Reduction Act (TRA), including providing confirmation of Phase I Toxic Reduction Plans (the Plans).

The following Planner Confirmation Statement, which comes in lieu of the Planner Certification Statement required under s. 19.1(4) of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 11 of O. Reg. 214/11) satisfies the requirements for the Plans that are assembled as a single document as of the date of this Planner Confirmation Statement. Furthermore, the following confirmation statement is limited to the respective versions of the Plans which are dated as indicated in the Certification Statement:

As of (May 28, 2013), I, Mark Wiedener confirm that I am familiar with the processes at the Marswell Metal Industries Ltd. Facility that use of create the toxic substances referred to below, that I agree with the estimates referred to in its contents, and it satisfies all other requirements, with the exception of the regulatory deadline as determined by the Toxic Reduction Act and Ontario Regulation 455/09.

• Lead (May 28, 2013)


Mark Wiedener
Toxic Substance Reduction Planner
License No. TSRP 0255

May 29, 2013
Date

Greenflow Environmental Services Inc.
4701 Mainville Drive
Burlington, Ontario, Canada
L7R 5G5
(905) 281-0900



TECHNICAL MEMORANDUM

Toxic Substance Reduction Plans Confirmation by Highest Ranking Employee

As required by s. 4(2) of the *Toxics Reduction Act* (TRA), Toxic Substance Reduction Plans must contain a certification signed by the highest ranking employee at the Facility who has management responsibilities relating to the Facility.

As a result of the inability to meet the regulatory deadline of December 31, 2012, this Plan contains a confirmation statement from the highest ranking employee in lieu of the required certification statement:

As of (date) May 29, 2013, I, (insert name) Kevin Milne, confirm that I have read the toxic substance reduction plans for the toxic substances referred to below and am familiar with their contents, and to my knowledge the plans are factually accurate and comply with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 made under that Act, with the exception of the certification statements as a result of the inability of the Facility, in spite of its best efforts, to meet the December 31st regulatory deadline. This was mainly due to the Facility allocating time and resources towards updating ministry approvals with regard to air and seeking proper testing to aid in the creation of this document.

- Lead (May 28, 2013)



Kevin Milne
President
Marswell Metal Industries Ltd.

May 29, 2013
Date

Greenflow Environmental Services Inc.
4700 Markham Drive
Burlington, Ontario, Canada
L7R 5Y5
1-800-387-5566

Marswell Metal Industries Ltd.

**Toxic Substance
Reduction Plan**

**Antimony
Version 1.0**

Document Version Control

This document constitutes the Toxic Substance Reduction Plan Version 1.0 for the prescribed toxic substance referred to as “Antimony” under the *Toxics Reduction Act*. S.22 of the Ontario Regulation (O.Reg) 455/09 provides the framework for Plan review and requirements for a new version of the Plan. This plan satisfies all requirements contained within O.Reg. 455/09, except for the inclusion of the certification statements from the Highest Ranking Employee (HRE), as well as the licensed Toxic Substance Reduction (TSRP) Planner. This is due to the fact that Mars Metals, in spite of their best efforts, were unable to submit the Plan to the Ministry on, or before the prescribed deadline for Phase I toxic substances of December 31st, 2012. Unlike some other pieces of legislation, the TRA does not provide Ministry staff with the authority to change the reporting deadlines, and on the advice of Ontario’s Toxic Substance Reduction Programs administration, in place of the certification statements, this document will include a confirmation statement from the HRE at the Facility, as well as a confirmation statement from the licensed TSRP Planner.

This plan is to be updated by the end of the calendar year in which a significant change in processes (as defined in s. 1(3) of O.Reg 455/09) has occurred. The first mandatory Plan update is required to be completed by December 31st, 2018.

Future updates of this Plan will be assigned a new version number.

Version	Date	Revision Description	Reviewed by (Facility Contact)
1.0	May 29, 2013	TSRP Version 1.0	Kevin Milne

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Executive Summary

This Toxic Substance Reduction Plan (the Plan) was prepared in accordance with s.3 of the *Toxics Reduction Act* (TRA) and s.9 of the Ontario Regulation (O.Reg.) 455/09 for the prescribed toxic substance referred to as “Antimony” (the Toxic Substance) for Mars Metal Specialty Castings, MarsKeel & MarShield – a division of Marswell Metal Industries. The services of these divisions include: pattern making, mold manufacturing, custom/production castings, priming, and painting. The facility is located at 4140 Morris Drive in Burlington, Ontario. The main products produced are counterweights, alloyed lead, certified nuclear castings, and keels for the sailing industry. The facility operates from 6:30AM – 6:30 PM Monday to Thursday, and 6:30AM – 5:30PM on Fridays. Production does not occur during weekend hours. Guidance within the Ontario Ministry of the Environment (MOE) publication *Toolkit for Toxic Substance Reduction Planning*, version from February 15th, 2012 (the MOE Planning Toolkit) was followed, as appropriate, during the making of this document.

The TRA was passed in the Ontario Legislature in June 2009. The MOE has stated that the goal of the TRA is to promote reductions in the use and creation of prescribed toxic substances, inform Ontarians about toxic substances in their communities and to help ensure that Ontario is properly positioned to be competitive within the global economy, which has been placing greater emphasis on ‘green initiatives’.

The TRA is intended so that regulated facilities give a consistent level of consideration to opportunities for reducing, or eliminating, where possible, the prescribed substances; however, it does not restrict or require elimination of prescribed toxic substances.

Under the TRA, regulated facilities are required to:

- Perform quantification, accounting and reporting on the toxic substance use, creation, amount contained product, and release at the Facility on an annual basis;
- Prepare Toxic Substance Reduction Plans in which it is documented, where feasible, how the use and creation of toxic substances might be reduced;
- Have the Toxic Substance Reduction Plan certified by an MOE licensed Toxic Substance Reduction Planner (the Planner) as well as the Highest Ranking Employee (HRE) at the Facility;
- Prepare Plan Summaries containing various components of the Toxic Substance Reduction Plans and make them available to the public;
- Submit annual reports on progress made on the Plans; and
- Update the Plans at least every five years.

Unlike tracking, accounting, reporting and preparation of a Toxic Substance Reduction Plan, which are all requirements; the implementation of any toxic substance reduction

options identified in the Plan is not a requirement of the TRA or O.Reg. 455/09. The Facility is captured by the requirements of the TRA pertaining to the Toxic Substance since the Facility meets the TRA's definition of target facilities within North American Industry Classification System (NAICS) codes by falling under the NAICS code 331529 (Non-Ferrous foundries – except die-casting) and falls under Schedule 3 of O.Reg. 419/05, thus AERMOD will be used to model the emissions from Mars Metal's facility.

The main emissions from this site are from the lead casting process and the product finishing process, with a small amount of emissions being from the comfort heating. A source testing program was conducted between August 15th and August 24th of 2011 to evaluate the emissions produced by the lead casting process. Mars Metal has operated previously under Certificate of Approval (Air) 8-3385-94-997. The Facility was inspected by the Ministry of the Environment local Halton district office and an order was issued to update the Certificate of Approval.

A Toxic Substance Reduction Plan Component Checklist (the Plan Component Checklist), which outlines the minimum content requirements of a Toxic Substance Reduction Plan, is provided following this Executive Summary. This Plan is structured so that section headings correspond to the items in the Plan Component Checklist. This approach is designed to provide a clear depiction of this Plan's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09.

S.4(1) of the TRA requires that a Plan include either a statement of the Facility's intent to reduce the use and/or creation of the Toxic Substance at the Facility, or the reasons for not including this statement, as well as objectives of the Plan.

The Toxic Substance has triggered reporting under the TRA and O.Reg. 455/09 due to three activities at the Facility which are defined as "uses" of the Toxic Substance under the TRA Framework. These three "uses" are:

- Lead casting
- Product finishing
- Comfort Heating

Since the Toxic Substance for which this plan is being completed is not "created" at the Facility, but instead is the raw material for the finished product, this Plan does not intend to address the reduction in the "creation" of the Toxic Substance, as the only feasible way to accomplish this would be to reduce production levels. In light of the aforementioned information, the objectives of this Plan are as follows:

- Provide support for the Facility's position with respect to the Statement of Intent of this Plan; and

- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

A Plan Summary corresponding to this Plan, which was prepared in accordance with s.23 of O.Reg 455/09 is included as Appendix C of this Plan. Information contained in this Plan summary has been provided to the MOE through the 'Single Window' reporting system. Furthermore, the Plan is available on Mars Metal's website and can be provided to a member of the public upon written request.

This Plan documents the Facility's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

1.0 Introduction

Refer to Master Document (Lead) Section 1.0

2.0 Basic Facility Information

Refer to Master Document (Lead) Section 2.0

3.0 Planner License Number

Refer to Master Document (Lead) Section 3.0

4.0 Statement of Intent and Objectives of the Plan

Refer to Master Document (Lead) Section 4.0

5.0 Toxic Substance Quantification, Accounting and Reporting Information

As required by s 12 of O.Reg 455/09, the Facility was required to fulfill its Toxic Substance quantification, accounting, and reporting (QAR) requirements for all reporting years to date. The following sections provide a description of how the Toxic Substance QAR exercise was completed and how each item under s. 12 of O.reg 455/09 were addressed. An Emissions Summary Dispersion Modeling Report was prepared for the casting, finishing, and comfort heating operations at the facility in order to quantify the emissions of the Toxic Substance to outside sources.

The Facility only utilizes one type of lead ingot that contains Antimony – the G2 Lead. at the advice of the supplier, the Facility consulted the SDS sheets for the raw material in order to quantify the presence of the Toxic Substance. It was noticed that, on average, the ingots, or “pigs” are comprised of 3% Antimony. For the purposes of quantification, Antimony was modeled using the results of the Lead model, and multiplying it by 0.05, as Antimony emissions were ~5% of the lead emissions. Results of the emissions quantification for antimony can be located in Figure 1 of this Plan.

5.1 Quantification at the Process Level

Refer to Master Document section 5.1 and its subsections

6.0 Estimate of Direct and Indirect Annual Costs Associated with the Toxic Substance

Refer to Master Document Section 6.0

7.0 Options Considered for Reduction

Refer to Master Document Section 7.0 and its subsections

8.0 Rationale for Not Implementing Toxic Substance Reduction Options

Refer to Master Document Section 8.0

9.0 Planner Recommendations and Rationale

Refer to Master Document Section 9.0

10.0 Plan Summary

As required by s. 8 of the TRA, a Plan Summary in accordance with s. 23 of O. Reg 455/09 is included in Appendix A – Plan Summary. Information contained in the Plan summary has been provided to the MOE through the “Single Window” reporting system.

Additionally, the Plan Summary is available on Marswell Metal Industries’ website and can be provided to a member of the public upon written request. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

11.0 Confirmations

In spite of the Facility’s best efforts, it was unable to complete the requirements of the TRA before the deadline of December 31st, 2012. As a result, and in accordance with the TRA, this plan falls outside compliance in that regard and therefore cannot be certified as such. In this situation, the MOE has recommended that the Toxic Substance Reduction Planner should confirm in writing, with signature, that s/he is familiar with the processes at the facility, agrees with the estimates of reduction (if any) for those options that will be implemented (if any) and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

The highest ranking employee should provide a rationale as to why the December 31st, 2012 deadline was not met. In addition, s/he should confirm in writing, with signature, that s/he has read the plan, is familiar with its contents and, to his/her knowledge, the plan

is factually accurate and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

These confirmation statements have been attached at the end of this Plan as Appendix B – Confirmation Statements from the Planner and Highest Ranking Employee.

Figure 1 – Calculations, Analysis, and Summary of Emissions for Antimony

Emission Summary Table							
Contaminant	CAS #	Emission Rate (g/s)	Dispersion Model Used	POI Conc. ($\mu\text{g}/\text{m}^3$)	Averaging Period	MOE Criteria ($\mu\text{g}/\text{m}^3$)	% of Criteria
Antimony	7440-36-0	0.0000937	AERMOD	0.02	24	25	0.08%

Emission Calculation:

Given that it has been stated within this Plan that the Facility has conservatively established a 5% composition of Antimony within its raw materials, they have estimated the following in relation to the calculation of the Toxic Substances’ emissions from the Facility:

Antimony Emission Rate (kg/year) = Lead Emission rate \times 0.05

OR

Antimony Emission Rate (kg/year) = 6.303 \times 0.05

Antimony Emission Rate (kg/year) = 0.31515

Appendix A - Plan Summary

This Toxic Substance Reduction Plan Summary has been prepared in accordance with Section 8(2) of the *Toxics Reduction Act* and satisfies the minimum Plan Summary content requirements stipulated in Section 24 of Ontario Regulation (O. Reg.) 455/09

Basic Facility Information

Mandatory Basic Facility Information	Details
Substance Name and Chemical Abstracts Service (CAS) Registry Number for the Substance(s) whose Toxic Substance Reduction Plans are summarized by this Plan Summar	Antimony (per O. Reg. 455/09 “no single CAS number applies to these substances”)
National Pollutant Release Inventory (NPRI) Number	NPRI Id: 000000 - 4834
Legal and Trade names of the owner and the operator of the facility, street address of facility, and mailing address of facility if different	Marswell Metal Industries Ltd. 4140 Morris Drive. Burlington, Ontario, Canada L7L 5L6
Number of Full Time employee equivalents	16
Two-and four-digit North American Industry Classification System (NAICS) codes and the six-digit NAICS Canada code	33 – Manufacturing 3315 – Foundries 331529 – Non-ferrous foundries (except die-casting)
Public Contact	Mr. Kevin Milne Operations Manager Mars Metal Specialty Castings (address per above) (905) 637-3862
Spatial coordinates of facility expressed in UTM	UTM Zone 17 598835.24 E, 4802426.54 N
Parent Company Information	Marswell Metal Industries Ltd. 4140 Morris Drive Burlington, Ontario, Canada L7L 5L6 (905) 637-3862

List of All Substances for which Toxic Substance Reduction Plans Have Been Prepared at the Facility

The Facility has prepared Toxic Substance Reduction Plans for the following prescribed Toxic Substances:

- Lead *
- Antimony *
- Xylene (CAS number 1330-20-7)
- Ethyl Benzene (CAS number 100-41-4)

* = No single CAS number applies to these substances as per O. Reg. 455/09

Statement of Intent

A statement of the Facility's intent to reduce the use of the Toxic Substance has not been included as part of this Plan. The Toxic Substance is never created within the Facility's process and therefore no statement with respect to intent to reduce creation of the Toxic Substance is required.

The Toxic Substance has triggered reporting under the TRA and O.Reg 455/09 due to it being contained within the raw material that Mars Metal Company utilizes to create its finished product. There are 3 main "uses" of the Toxic Substance that take place within the facility; the first function, which can be defined as a "use", is the creation of the product by melting lead ingots, or large lead "pigs" in the melting furnaces. The second "use" of the Toxic Substance occurs when the melted lead is poured from one of the melting furnaces into a prefabricated mold where it is left to cool, and harden. As the lead hardens, it shrinks within the mold, leading to more small amounts of lead being added to the top of the mold. The final "use" of the raw material is in addition to the casting process; after the lead has hardened and has been removed from the mold, Mars Metals performs surface finishing on their products. Freshly cast products are subjected to surface grinding to remove any "burs", or inconsistencies, after which they may be coated with an epoxy resin and painted, although this can vary depending on the desire of the customer. As it is the raw material, the purchase of the product that is used within the Facility which contains the Toxic substance is a significant capital expenditure and therefore optimizing the use of the product which contains the Toxic substance is in the Facility's best interest as it is directly related to cost control. Throughout the course of achieving the current level of process and practice optimization with respect to the Toxic Substance and considering the above aspects which influence the Facility's use of the toxic substance, the Facility has considered many options to reduce its use of the Toxic Substance and has already completed internal assessments of some initiatives which could constitute toxic substance reduction options that could otherwise be identified for the purposes of this Plan. Some of these initiatives are mentioned within this Plan, however, they have not been provided as

toxic substance reduction options for the purposes of this Plan since they have previously been deemed not to be feasible or implemented. The sources of emissions include the three lead casting furnaces, the surface finishing area, and comfort heating.

Given the above information, the Toxic Substance flows through the Facility process without undergoing any chemical change and, due to its presence within the raw material, this Facility activity which the TRA has defined as a “use” of the Toxic Substance can only be reduced by reducing the Facility’s overall level of production. However, Mars Metals is acutely aware of the dangers that the Toxic Substance presents to the natural environment, and will continue to evaluate all opportunities to minimize the potential release of the Toxic Substance to outside sources. Mars Metals is currently working with the Ministry of the Environment to update its Certificate of Approval to ensure that they are operating in a transparent fashion.

Objectives of the Toxic Substance Reduction Plan

The objectives of this Plan are as follows:

- Provide support for the Facility’s position with respect to the Statement of Intent of this Plan; and
- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

Description of Why the Toxic Substance is Used or Created

As stated elsewhere in this plan, the Toxic Substance reporting under the TRA and O.Reg 455/09 was triggered due to a few activities at the Facility which involve the use of the Toxic Substance as its raw material. These activities are:

Lead Casting Operation:

Mars Metal operates a lead casting process which melts lead ingots and pours them into pre-formed molds. There are a total of three furnaces, which can process 3500lbs (Furnace #1), 12000lbs (Furnace #2), and 12000lbs (Furnace #3) respectively. Mars Metal pours the lead to manufacture counterweights, radiation shielding bricks, and boat keels. Furnace #1 is used exclusively for brick and counterweight pouring, while Furnace #2 and Furnace #3 are used mainly for the pouring of boat keels. The composition of the lead is specified at the time of the order by the supplier, but is typically 95-96% lead composition, with the remaining 4-5% consisting of various elements. This composition of lead/trace elements is desirable, and is generally the industry standard, as it provides a certain luster, and density to meet the demands of the consumer.

Each furnace undergoes the following procedure for melting lead: The ingots (or “pigs”) which enter the facility in weights of 40lbs, 65lbs, or 1000lbs, are stored indoors in a holding area. When needed, they are transported via a fork-truck to the furnaces. The ingots (or “pigs”) are then loaded into the furnace pot and heated to 550-800 °F. Lead

ingots take approximately 1-4 hours to melt depending on the furnace. When the ingots are being melted, the desired mold is moved into place at the base of the furnace and, in the case of the keels, secured to prevent any movement or deviation. Once the lead is ready to be poured, a pipe is lowered into the top of the mold and a valve is opened to allow for the flow of lead. To prevent unwanted clogging of the lead, an acetylene torch may be used to heat the pour pipe, as well as the lead mold itself. Once the mold is filled to the desired level, the top of the lead is skimmed to remove any dross or contaminants, and the mold is left to cool. A keel pour generally takes 5-10 minutes to complete. Over the next couple of hours, the top of the lead is re-melted with the acetylene torch and lead is added to compensate for the shrinkage in the mold that occurs.

The pouring of bricks occurs in an assembly line fashion. There are four stages: pouring the lead into the mold, cooling, addition of lead to compensate for shrinkage, removing the lead brick from the mold. Multiple molds are used simultaneously to keep the production moving in an efficient manner. At full production, an average of 60 bricks can be produced per hour of operation. Generally, when operating under normal conditions, one employee will pour bricks at a rate of 15-20 bricks per hour.

The emissions from the site are emitted into the atmosphere from two sources: a combined furnace/dross ventilation stack, and general ventilation from the Facility. Refer to Figure 1 for a schematic of the process. An ESDM report was prepared in order to track and quantify the emissions. The results of this report can be located in Figure 2.

Keel Finishing Operation:

Once the Lead cools overnight, the mold will be opened and the keel will be hung up in one of 3 rooms. Large curtains are used to contain any dust. During high production, 3 small keels can be completed per day by three employees. These keels generally weigh roughly 4000lbs; larger keels can take 2-3 days to complete depending on the required finishes as determined by the customer. Four stages are required to finish a keel: grinding, coating, sanding, and painting. Each process creates a unique set of contaminants which are dealt with accordingly. The SDS sheets for each product can be found at the end of the Plan, within the supporting documents section.

An electric grinder is used to remove any protruding imperfections from the keel. This includes any rough edges or “burs”, especially along the seams of the mold. The large lead grindings fall to the ground and are swept up and disposed of in UN approved containers, and stored on pallets in the shipping area. These drums will then be shipped back to the ingot supplier to be smelted into new lead pigs. Grinders and sanders are connected to a centralized Nilfisk CFM 127 industrial vacuum. The air stream is pulled through a HEPA filter and re-delivered to the Facility. Grinding and sanding can take anywhere between 1-8 hours, depending on the desired finish. Emissions from these operations can be considered negligible as the size and density of the particles, which are not captured in the vacuum system, prevent them from becoming airborne. This allows the larger particles to settle at the ground level where they can be recovered.

Comfort Heating:

Mars Metal's Burlington operation includes two buildings located adjacent to each other, the general office/warehouse building and the manufacturing building. Both buildings include space heaters in the larger, open spaces, and an HVAC unit for the offices. The below table is a summary of the comfort heating units and their respective fuel input ratings.

Rationale for Not Implementing Toxic Substance Reduction Options

As required by s. 18(4) of O. Reg. 455/09 (as amended by s. 9(3) of O. Reg. 214/11), a Plan must contain an explanation as to why no toxic substance reduction options will be implemented

Facility personnel have considered each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent section of this Plan, the Facility feels that no toxic substance reduction options can be identified in any of the seven toxic substance reduction categories.

Therefore, the rationale for not implementing toxic substance reduction options is that no toxic substance reduction options could be identified.

Statement that the Plan Summary Accurately Reflects the Current Version of the Plan

As required by s. 24(1)8 of O.Reg. 455/09 this Plan Summary accurately reflects the current version of the Plan.

Planner License Number

As required by s. 18(2) of O. Reg. 455/09 (as amended by s. 9(2) of O. Reg. 214/11), the Licensed Toxic Substance Reduction Planner responsible for providing Planner recommendation on and confirmation of this Plan as follows:

Mark Wiedener
Co-Owner/Vice President
Greenflow Environmental Sciences Inc.
Toxic Substance Reduction Planner License Number TSRP0255

Copies of the Confirmation

In lieu of the certification statements, this Plan has included confirmation statements which are provided on the following page.

Appendix B – Confirmation Statement



TECHNICAL MEMORANDUM

May 28, 2013

Mark Wiedener
Greenflow Environmental Services Inc.

LICENSED TOXIC SUBSTANCE REDUCTION PLANNER CERTIFICATION STATEMENT FOR PHASE I TOXIC SUBSTANCE REDUCTION PLANS FOR MARSWELL METAL INDUSTRIES LTD, INCLUDING ITS DIVISIONS MARSKEEL, MARS METAL SPECIALTY CASTINGS.

Dear Mr. Milne,

Greenflow Environmental Services Inc. (Greenflow) was engaged by Marswell Metal Industries Ltd. (the Facility) to provide guidance pertaining to Phase I Toxic Substance Reduction Plan preparation under the Toxics Reduction Act (TRA), including providing confirmation of Phase I Toxic Reduction Plans (the Plans).

The following Planner Confirmation Statement, which comes in lieu of the Planner Certification Statement required under s. 19.1(4) of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 11 of O. Reg. 214/11) satisfies the requirements for the Plans that are assembled as a single document as of the date of this Planner Confirmation Statement. Furthermore, the following confirmation statement is limited to the respective versions of the Plans which are dated as indicated in the Certification Statement:

As of (May 28, 2013), I, Mark Wiedener confirm that I am familiar with the processes at the Marswell Metal Industries Ltd. Facility that use of create the toxic substances referred to below, that I agree with the estimates referred to in its contents, and it satisfies all other requirements, with the exception of the regulatory deadline as determined by the Toxic Reduction Act and Ontario Regulation 455/09.

- Antimony (May 28, 2013)


Mark Wiedener
Toxic Substance Reduction Planner
License No. TSRP 0255

May 29, 2013
Date

Greenflow Environmental Services Inc.
2022 Aurora Mills
Burlington, Ontario, Canada
L7R 6A5
1-800-237-1433



TECHNICAL MEMORANDUM

Toxic Substance Reduction Plans Confirmation by Highest Ranking Employee

As required by s. 4(2) of the *Toxics Reduction Act (TRA)*, Toxic Substance Reduction Plans must contain a certification signed by the highest ranking employee at the Facility who has management responsibilities relating to the Facility.

As a result of the inability to meet the regulatory deadline of December 31, 2012, this Plan contains a confirmation statement from the highest ranking employee in lieu of the required certification statement:

As of (date) May 29, 2013, I, (insert name) KEVIN MILNE, confirm that I have read the toxic substance reduction plans for the toxic substances referred to below and am familiar with their contents, and to my knowledge the plans are factually accurate and comply with the *Toxics Reduction Act, 2009* and *Ontario Regulation 455/09* made under that Act, with the exception of the certification statements as a result of the inability of the Facility, in spite of its best efforts, to meet the December 31st regulatory deadline. This was mainly due to the Facility allocating time and resources towards updating ministry approvals with regard to air and seeking proper testing to aid in the creation of this document.

- Antimony (May 28, 2013)



Kevin Milne
President
Marswell Metal Industries Ltd.

May 29, 2013
Date

Greenflow Environmental Services Inc.
444 Main Street
Burlington, Ontario, Canada
L7R 4K5
1-800-667-1414

Marswell Metal Industries Ltd.

**Toxic Substance
Reduction Plan**

**Xylene
Version 1.0**

Document Version Control

This document constitutes the Toxic Substance Reduction Plan Version 1.0 for the prescribed toxic substance referred to as “Xylene” under the *Toxics Reduction Act*. S.22 of the Ontario Regulation (O.Reg) 455/09 provides the framework for Plan review and requirements for a new version of the Plan. This plan satisfies all requirements contained within O.Reg. 455/09, except for the inclusion of the certification statements from the Highest Ranking Employee (HRE), as well as the licensed Toxic Substance Reduction (TSRP) Planner. This is due to the fact that Mars Metals, in spite of their best efforts, were unable to submit the Plan to the Ministry on, or before the prescribed deadline for Phase I toxic substances of December 31st, 2012. Unlike some other pieces of legislation, the TRA does not provide Ministry staff with the authority to change the reporting deadlines, and on the advice of Ontario’s Toxic Substance Reduction Programs administration, in place of the certification statements, this document will include a confirmation statement from the HRE at the Facility, as well as a confirmation statement from the licensed TSRP Planner.

This plan is to be updated by the end of the calendar year in which a significant change in processes (as defined in s. 1(3) of O.Reg 455/09) has occurred. The first mandatory Plan update is required to be completed by December 31st, 2018.

Future updates of this Plan will be assigned a new version number.

Version	Date	Revision Description	Reviewed by (Facility Contact)
1.0	May 29, 2013	TSRP Version 1.0	Kevin Milne

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Appendices

Executive Summary

This Toxic Substance Reduction Plan (the Plan) was prepared in accordance with s.3 of the *Toxics Reduction Act* (TRA) and s.9 of the Ontario Regulation (O.Reg.) 455/09 for the prescribed toxic substance referred to as “Xylene” (the Toxic Substance) for Mars Metal Specialty Castings, MarsKeel & MarShield – a division of Marswell Metal Industries. The services of these divisions include: pattern making, mold manufacturing, custom/production castings, priming, and painting. The facility is located at 4140 Morris Drive in Burlington, Ontario. The main products produced are counterweights, alloyed lead, certified nuclear castings, and keels for the sailing industry. The facility operates from 6:30AM – 6:30 PM Monday to Thursday, and 6:30AM – 5:30PM on Fridays. Production does not occur during weekend hours. Guidance within the Ontario Ministry of the Environment (MOE) publication *Toolkit for Toxic Substance Reduction Planning*, version from February 15th, 2012 (the MOE Planning Toolkit) was followed, as appropriate, during the making of this document.

The TRA was passed in the Ontario Legislature in June 2009. The MOE has stated that the goal of the TRA is to promote reductions in the use and creation of prescribed toxic substances, inform Ontarians about toxic substances in their communities and to help ensure that Ontario is properly positioned to be competitive within the global economy, which has been placing greater emphasis on ‘green initiatives’.

The TRA is intended so that regulated facilities give a consistent level of consideration to opportunities for reducing, or eliminating, where possible, the prescribed substances; however, it does not restrict or require elimination of prescribed toxic substances.

Under the TRA, regulated facilities are required to:

- Perform quantification, accounting and reporting on the toxic substance use, creation, amount contained product, and release at the Facility on an annual basis;
- Prepare Toxic Substance Reduction Plans in which it is documented, where feasible, how the use and creation of toxic substances might be reduced;
- Have the Toxic Substance Reduction Plan certified by an MOE licensed Toxic Substance Reduction Planner (the Planner) as well as the Highest Ranking Employee (HRE) at the Facility;
- Prepare Plan Summaries containing various components of the Toxic Substance Reduction Plans and make them available to the public;
- Submit annual reports on progress made on the Plans; and
- Update the Plans at least every five years.

Unlike tracking, accounting, reporting and preparation of a Toxic Substance Reduction Plan, which are all requirements; the implementation of any toxic substance reduction

options identified in the Plan is not a requirement of the TRA or O.Reg. 455/09. The Facility is captured by the requirements of the TRA pertaining to the Toxic Substance since the Facility meets the TRA's definition of target facilities within North American Industry Classification System (NAICS) codes by falling under the NAICS code 331529 (Non-Ferrous foundries – except die-casting) and falls under Schedule 3 of O.Reg. 419/05, thus AERMOD will be used to model the emissions from Mars Metal's facility.

The main emissions from this site are from the lead casting process and the product finishing process, with a small amount of emissions being from the comfort heating. A source testing program was conducted between August 15th and August 24th of 2011 to evaluate the emissions produced by the lead casting process. Mars Metal has operated previously under Certificate of Approval (Air) 8-3385-94-997. The Facility was inspected by the Ministry of the Environment local Halton district office and an order was issued to update the Certificate of Approval.

A Toxic Substance Reduction Plan Component Checklist (the Plan Component Checklist), which outlines the minimum content requirements of a Toxic Substance Reduction Plan, is provided following this Executive Summary. This Plan is structured so that section headings correspond to the items in the Plan Component Checklist. This approach is designed to provide a clear depiction of this Plan's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09.

S.4(1) of the TRA requires that a Plan include either a statement of the Facility's intent to reduce the use and/or creation of the Toxic Substance at the Facility, or the reasons for not including this statement, as well as objectives of the Plan.

The Toxic Substance has triggered reporting under the TRA and O.Reg. 455/09 due to two activities at the Facility which are defined as "uses" of the Toxic Substance under the TRA Framework. These two "uses" are:

- Product finishing
- Comfort Heating

Since the Toxic Substance for which this plan is being completed is not "created" at the Facility, but instead is an ingredient within some of the finishing products utilized within the Facility, this Plan does not intend to address the reduction in the "creation" of the Toxic Substance, as the only feasible way to accomplish this would be to reduce production levels. In light of the aforementioned information, the objectives of this Plan are as follows:

- Provide support for the Facility's position with respect to the Statement of Intent of this Plan; and

- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

A Plan Summary corresponding to this Plan, which was prepared in accordance with s.23 of O.Reg 455/09 is included as Appendix C of this Plan. Information contained in this Plan summary has been provided to the MOE through the 'Single Window' reporting system. Furthermore, the Plan is available on Mars Metal's website and can be provided to a member of the public upon written request.

This Plan documents the Facility's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

1.0 Introduction

Refer to Master Document (Lead) Section 1.0

2.0 Basic Facility Information

Refer to Master Document (Lead) section 2.0

3.0 Planner License Number

Refer to Master Document (Lead) Section 3.0

4.0 Statement of Intent and Objectives of The Plan

As required by s.4(1) of the TRA, a Plan must include a statement of the Facility's intent to reduce the use and/or creation of the Toxic Substance, or the Plan must state the reason why this is not feasible for the Facility to reduce the use and/or creation of the Toxic Substance.

This Plan will outline the Facility's current practices with respect to its use of the Toxic Substance and supports the Facility's position that no toxic substance reduction options can be identified, or implemented for the Toxic Substance at this current time.

4.1 Statement of Intent

A statement of the Facility's intent to reduce the use of the Toxic Substance has not been included as part of this Plan. The Toxic Substance is never created within the Facility's process and therefore no statement with respect to intent to reduce creation of the Toxic Substance is required.

The Toxic Substance has triggered reporting under the TRA and O.Reg 455/09 due to it being contained within the raw material that Mars Metal Company utilizes to create its finished product. There are 2 main "uses" of the Toxic Substance that take place within the facility; the first function, which can be defined as a "use", is the application of the ferring compounds to a molded keel in order to smooth out inefficiencies and to create a protective layer against natural elements.. Freshly cast products are subjected to surface grinding to remove any "burs", or inconsistencies, after which they may be coated with an epoxy resin and painted, although this can vary depending on the desire of the customer. The second process which can be defined as a "use" of the Toxic Substance is the application of the final coat of paint to the finished keel. The Toxic Substance is an ingredient within both the ferring compound, as well as the paint that is utilized within the facility. The purchase of the product that is used within the Facility which contains the Toxic substance is a marginal and ongoing capital expenditure and therefore optimizing the use of the product which contains the Toxic substance is in the Facility's best interest as it is directly related to cost control. Throughout the course of achieving the current level of process and

practice optimization with respect to the Toxic Substance and considering the above aspects which influence the Facility's use of the toxic substance, the Facility has considered many options to reduce its use of the Toxic Substance and has already completed internal assessments of some initiatives which could constitute toxic substance reduction options that could otherwise be identified for the purposes of this Plan. Some of these initiatives are mentioned within this Plan, however, they have not been provided as toxic substance reduction options for the purposes of this Plan since they have previously been deemed not to be feasible or implemented.

4.2 Objectives of the Plan

The objectives of this Plan are as follows:

- Provide support for the Facility's position with respect to the Statement of Intent of this Plan; and
- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

5.0 Toxic Substance Accounting, Quantification, and Reporting Information

As required by s 12 of O.Reg 455/09, the Facility was required to fulfill its Toxic Substance quantification, accounting, and reporting (QAR) requirements for all reporting years to date. The following sections provide a description of how the Toxic Substance QAR exercise was completed and how each item under s. 12 of O.reg 455/09 were addressed. An Emissions Summary Dispersion Modeling Report was prepared for the casting, finishing, and comfort heating operations at the facility in order to quantify the emissions of the Toxic Substance to outside sources.

5.1 Description of Each Process That Uses the Toxic Substance

As stated elsewhere in this plan, the Toxic Substance reporting under the TRA and O.Reg 455/09 was triggered due to a few activities at the Facility which involve the use of the Toxic Substance as its raw material. These activities are:

- The addition of Finishing Compounds to a molded keel
- The addition of water-resistant paint to the finished keel

After grinding, one of two coatings will be applied to the keel, an ATC Poly-Fair F26 or an Epoxy Tech 833-H. The Epoxy Tech product will be mixed with Tri-Text 0834H in a ratio of 5:1 respectively. The Poly-Fair will be mixed with Cadox L-50A in a ratio of 50:1 respectively. Both compounds will create a putty-like substance which is slathered onto the keel and smoothed out with a putty knife. The coating is used to fill any pores or imperfections on the surface of the keel. During normal production, 95% of the keels will

be coated in the Poly-Fair mixture which takes < 1 hour to dry. The Epoxy Tech product will take up to 8 hours to dry. To calculate the emissions, two scenarios were considered:

- One (1) Epoxy Tech coated keel and Two (2) Poly Fair coated keels; and
- Three (3) Poly-Fair coated keels.

Since the compounds for the coatings do not overlap, we can assume one Epoxy Tech coated keel and three Poly-Fair coated keels are being processed simultaneously to remain conservative and to simplify the modeling.

Once the coating has dried, the keels will be sanded down to create a smooth, unblemished surface. Extra putty may be added to fill in any dents or blemishes. The final step before shipping the keels is to paint them in a water resistant paint. The paint is a mixture of Interprotect 2000E paint and Interprotect Curing product mixed at a ratio of 3:1 for the paint to curing product. The paint is applied by roller and left to dry overnight. After drying, the keel is moved to the shipping warehouse and stored until the end user is ready to receive it. By using a roller, there is no over-spray for the paint that is typically witnessed in spraying applications. Therefore the emissions from the painting process are limited to the solvents from the paint as it dries.

5.1.1 Records of Identification and Description of Stages and Processes of Facility Operation and Record Containing Process Flow Diagrams

Per guidance provided in the Accounting Toolkit, two PFDs, with a focus on the different Toxic Substances, have been provided as part of the Toxic Substance QAR exercise to give a visual representation of the movement of the Toxic Substance through every stage of the process where it is present and to show the relationships between the processes.

Stages and Process Overview Diagram

The “Stages and Processes Overview Diagram” provides descriptions, in general terms, of every stage of the Facility where the Toxic Substance is present. Refer to Figure 1 at the end of this Plan titled – Stages and Processes Overview Diagram

Process Flow Diagram

The PFD provides the appropriate level of detail to satisfy s. 12 of O. Reg. 455/09. It demonstrates how each stage where the Toxic Substance is present has been broken down into a sufficient number of individual processes to satisfy s.12(3) of O. Reg. 455/09. The PFD includes the following:

- The amount of the Toxic Substance that enters the process
- The amount of the Toxic Substance that is destroyed or transformed; and
- Any NPRI-reportable releases of the Toxic Substance

It should be noted that the Toxic Substance is never created within the Facility process and therefore no quantifications are required for an amount of Toxic Substance created.

5.2 Toxic Substance Accounting Information

5.2.1 Quantifications at the Process Level

Toxic Substance Quantifications are also provided in Figure 2. This information is provided on the “Calculations, Emissions Analysis and Summary” page. The following information has been included:

- A description of the quantification method;
- A rationale for selecting each quantification method;
- Data used to quantify the activity;
- Data quality for the quantification; and
- Sample calculation

Painting emissions would consist of VOC's from the paint as it dries. Figure 2 at the end of this Plan contains a summary of Toxic Substances that are reportable under the TRA that are present within the product as well as their estimated usage.

5.2.2 Records of Methods and Rationale for Selecting each Method used to Track and Quantify the Toxic Substance

As required by s. 12(6) of O. Reg 455/09, for each quantification method that was used to prepare process-level quantifications, a rationale for why the method was identified as the best available for the purpose of completing the exercise provided. In the process of identifying best available methods, the Facility used judgment based on relevance and effort required to obtain information and feels that it has gone to reasonable efforts in identifying and applying the best available methods for quantifications and collecting the information necessitated by the quantification method.

The facility understands that methods used to complete the Toxic Substance QAR exercise can only be changed under the circumstances stipulated in s. 12(7) of O. Reg. 455/09. At this time, the Facility does not intend to change the quantification methods that were used to complete the Toxic Substance QAR exercise for the purpose of completing the Toxic Substance QAR exercises for subsequent years.

Methodology

Based on personal communications with Mars Metal staff, ~1 quart of paint is used to paint the keels. The Facility uses a paint which is a 3:1 mix of Interprotect 2000E Grey and Interprotect Cure. Since the paint is rolled on, there is no overspray or TSP emissions. The VOC were therefore based on the vapour pressure of each compound as per Table B3 from the “Procedure for Preparing an ESDM Report” where any compound with a vapour pressure of < 1 kPa at low temperatures was considered negligible. Therefore any compound from the two coating products with a vapour pressure that is > 1 kPa was

assumed to be emitted as the coating dry. Figure 2 at this end of this Plan provides a sample calculation which will serve as an estimate for the usage of the Toxic Substance.

6.0 Estimate of Direct and Indirect Annual Costs Associated with the Toxic Substance

As required by s. 18(1) of O. Reg. 455/09, direct and indirect costs have been estimated for the Toxic Substance. In preparing cost estimates, several departments at the Facility were consulted. Cost items associated with the toxic substance were identified and fit into the following categories:

- Raw Materials; and
- General Facility Costs

The cost estimates along with comments are provided in Appendix A – Estimate of Direct and Indirect Annual Costs associated with the Toxic Substance.

O. Reg. 455/09 does not specify the level of detail to which a Facility must examine costs associated with a toxic substance, however, the Facility feels that it has gone to reasonable lengths in its efforts to estimate the costs associated with the Toxic Substance.

7.0 Options Considered for Reduction

S. 17 of O. Reg. 455/09 outlines the requirements for identification of toxic substance reduction options and provides the seven categories of toxic substance reduction options under which options are to be identified as part of the Plan.

7.1 Identification of Toxic Substance Reduction Options in Each of Seven Toxic Substance Reduction Categories

With the assistance of a licensed Toxic Substance Reduction Planner, Facility personnel have considered each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent, the Facility feels that it is impossible to reduce its use of the Toxic Substances without reducing production, and therefore, no toxic substance reduction options can be identified in any of the seven substance reduction categories.

It is not necessarily a requirement under O. Reg 455/09 to provide toxic substance reduction options, however s. 17(2) of O.Reg. 455/09 states that the following must be provided in the event that an option for toxic substance reduction cannot be identified in any of the seven toxic substance reduction categories.

“17(1)2. If an option cannot be identified for a category listed in paragraph 1, an explanation of why no options could be identified for the category”

Based on the information provided in the Statement of Intent section of this Plan, regarding activities at the Facility which meet the TRA’s definition of use of the Toxic Substance,

Marswell Metal Industries finds itself in a situation where options for reductions in the “use” of Toxic Substances cannot be identified under the TRA’s framework. Therefore, no toxic substance reduction options have been identified in any of the seven Toxic Substance reduction categories.

7.1.1 Materials and Feedstock Substitution

Substitution has been investigated. At this time, the Interprotect 2000E paint is already purchased by the facility in its “low VOC” formula and no other alternatives have been identified that would afford the Facility the luxury of being able to reduce its use of one Toxic Substance, without simply replacing the Toxic Substance with another Phase I Toxic Substance within the process. It is therefore the opinion of the facility that no product currently exists in the market that can offer any savings. The Interprotect 2000E paint is considered to be the industry standard, and it (or a similar product) is demanded by the market as being the premier finishing coating. In light of this information, the Facility is of the opinion that the only feasible way to decrease its “use” of the Toxic Substance, would be to scale back production, which would undoubtedly yield negative impacts to the Facility’s position within the market.

7.1.2 Product Design or Reformulation

Investigations into other substances have been completed and it has been concluded that the use of another paint, or re-formulation of the existing paint would not be technically feasible.

The Facility feels that current usage processes in place for the Interprotect 2000 E paint are adequate to ensure the least amount of the Toxic Substance is used in the process and therefore no toxic substance reduction options have been identified under the toxic reduction category “Product Design or Reformulation”

7.1.3 Equipment or Process Modification

Solvents are used in the paint formulation to promote quicker drying times. The Facility feels that this is a necessary component to allowing them to complete orders in a timely fashion and is therefore an essential component to maintain efficient operating procedures. Adding to this, the Interprotect 2000E paint system is generally accepted by the industry as being the industry standard. End users demand this finish on their products. The Facility also uses the low VOC version of the finishing product.

7.1.4 Spill and Leak Prevention

The Facility currently only uses and stores a minimal amount of the product. Typically, ordering is performed on an “as needed” basis, to limit the amount of the Toxic Substance that is stored on site. Furthermore, paints are opened when starting this part of the finishing process, and the contents are exhausted resulting in only trace amounts of the Toxic Substance left in the original container.

7.1.5 On-site Reuse or Recycling

Since the paint is only mixed and utilized on an “as needed” basis, recycling of the product is not an option as there is never any left-over paint to evaluate recycling options with. The Facility feels that reuse is also not an option, as this Plan previously stated, the paint is only mixed on an as needed basis and the contents are exhausted within the one operation.

Since the product is not created at within the Facility, and given that there is little waste other than the residue that remains in the containers, the Facility is of the opinion that this is not a feasible option when applied to the framework within the TRA.

7.1.6 Improved Inventory Management or Purchasing Techniques

As stated elsewhere in this Plan, the Facility currently uses the minimal amount of the Toxic Substance necessary to complete a desired function. The facility has evaluated their Inventory Management and Purchasing procedures previously, and it was determined that the current operation was found to serve the needs of the Facility best.

7.1.7 Training or Improved Operating Practices

The Facility feels that its operating procedures with regard to training of its employees on the hazards pertaining to the Toxic Substance. Also, the Facility feels that it has optimal practices using the best available technology that is economically achievable at this time and therefore no toxic substance reduction options have been identified under the toxic substance category “Training or Improved Operating Procedures”

7.2 Estimates of Potential Reductions Associated with Each Identified Toxic Substance Reduction Option

No toxic substance reduction options have been identified under s. 17(1)1 of O. Reg. 455/09, however, explanations of the Facility’s rationale for the conclusion that no toxic substance reduction options can be identified in each category have been provided, thereby satisfying s. 17(1)2. Therefore, the requirement to provide estimates of potential reductions associated with identified toxic substance reduction options under s. 17(1)3 of O. Reg. 455/09 are not required to satisfy s. 17 of O. Reg. 455/09 for the purposes of this Plan.

7.3 Identification of Technically Feasible Options

No toxic substance reduction options have been identified under s. 17(1)1 of O. Reg. 455/09, however, explanations of the Facility’s rationale for the conclusion that no toxic substance reduction options can be identified in each category have been provided, thereby satisfying s. 17(1)2. Therefore, the requirement to provide estimates of potential reductions associated with identified toxic substance reduction options under s. 17(1)3 of O. Reg. 455/09 are not required to satisfy s. 17 of O. Reg. 455/09 for the purposes of this Plan.

8.0 Rationale for not Implementing Toxic Substance Reduction Options

As required by s. 18(4) of O. Reg. 455/09 (as amended by s. 9(3) of O. Reg. 214/11), a Plan must contain an explanation of why no toxic substance reduction options will be implemented.

Facility personnel have carefully examined each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent section of this Plan, the Facility feels that no toxic substance reduction options can be identified in any of the seven toxic substance reduction categories at this time.

Therefore the rationale for not implementing toxic substance reduction options is that no toxic substance reduction options could be identified.

9.0 Planner Recommendations and Rationale.

As required by s. 18.2 of O. Reg 455/09 (as amended by s. 10 of O. Reg 214(11), the Facility provided a draft copy of the Plan to a licensed Toxic Substance Reduction Planner for the purpose of obtaining recommendations with respect to the plan. It should be noted that implementation of Planner Recommendations is not a requirement of O. Reg. 455/09 or the TRA.

A document addressing requirements pertaining to recommendations by a planner under s.18.2 of O. Reg 455/09 is provided in Appendix B – Planner Recommendations and Rationale.

10.0 Plan Summary

As required by s. 8 of the TRA, a Plan Summary in accordance with s. 23 of O. Reg 455/09 is included in Appendix C – Plan Summary. Information contained in the Plan summary has been provided to the MOE through the “Single Window” reporting system.

Additionally, the Plan Summary is available on Marswell Metal Industries’ website and can be provided to a member of the public upon written request. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

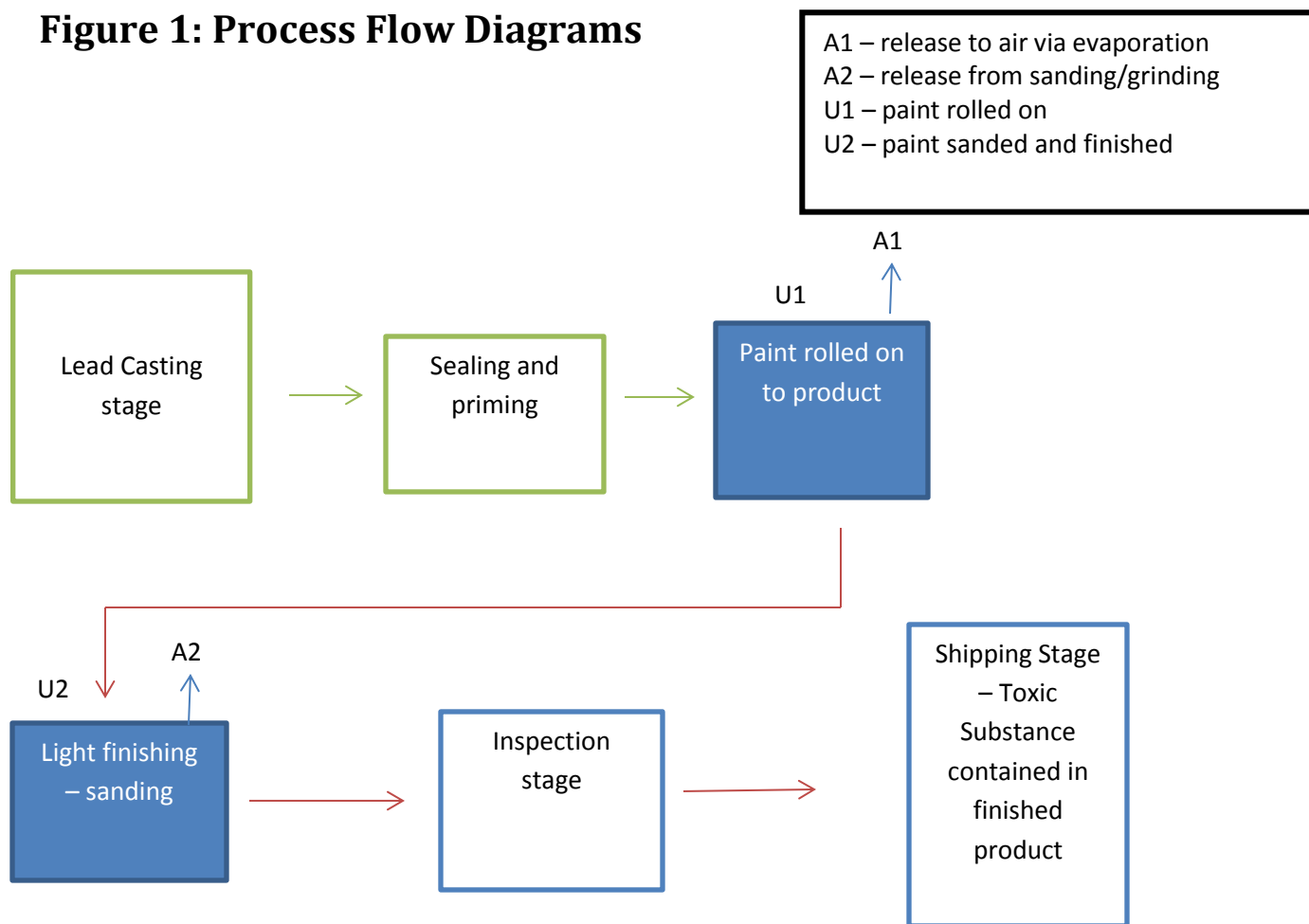
11.0 Certifications

In spite of the Facility’s best efforts, it was unable to complete the requirements of the TRA before the deadline of December 31st, 2012. As a result, and in accordance with the TRA, this plan falls outside compliance in that regard and therefore cannot be certified as such. In this situation, the MOE has recommended that the Toxic Substance Reduction Planner should confirm in writing, with signature, that s/he is familiar with the processes at the facility, agrees with the estimates of reduction (if any) for those options that will be

implemented (if any) and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

The highest ranking employee should provide a rationale as to why the December 31st, 2012 deadline was not met. In addition, s/he should confirm in writing, with signature, that s/he has read the plan, is familiar with its and, to his/her knowledge, the plan is factually accurate and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

These confirmation statements have been attached at the end of this Plan as Appendix D – Confirmation Statements from the Planner and Highest Ranking Employee.

Figure 1: Process Flow Diagrams**LEGEND**

Stage where Toxic Substance is not present



Movement of product containing Toxic Substance



Stage where Toxic Substance Is used - TSA was performed



Release to Air



Stage where Toxic Substance Is present in the product



Movement of product not containing Toxic Substance

Figure 2: Calculations, Emissions Analysis and Summary s.

5.2.1

Product	Component	% by weight (%)	Max Emission (g/day per keel)	MOE POI Limit ($\mu\text{g}/\text{m}^3$)	ER (g/s)	Emission Threshold
Interprotect 2000 E Grey	Xylene	1-10	112.10	730	2.34 E-02	8841.04
Interprotect 2000E Cure	Xylene	25-50	0.10	730	2.14 E-05	8841.04

Based on personal communication with Mars Metal, it takes up to 1 quart of paint to paint the keels. The Facility uses a paint which is a 3:1 mix of Interprotect 2000E Grey and Interprotect Cure. Since the paint is rolled on, there is no overspray or TSP emissions. The VOC were therefore based on the vapour pressure of each compound as per table B3 from the "Procedure for Preparing an ESDM Report" where any compound with a vapour pressure < 1 kPa at low temperatures can be considered negligible.

To calculate the Xylene emissions from the paint, the following calculations were used:

$\text{Usage}_{\text{Paint}} \text{ (g/d)} = \text{Total usage L/day} \times \text{ratio of product} \times \text{Density}$

$\text{Usage}_{\text{Paint}} \text{ (g/d)} = 0.94\text{L} \times 3 \text{ part paint} / 4 \text{ parts total} \times 1.59 \text{ g/ml}$

$\text{Usage}_{\text{Paint}} \text{ (g/d)} = 1120.95 \text{ g/day}$

$\text{Emission Rate}_{\text{Xylene}} \text{ (g/s)} = \text{Usage (g/d)} \times \% \text{ mass}_{\text{Xylene}} \times \text{Drying Time (hr/day)}$

$\text{Emission Rate}_{\text{Xylene}} \text{ (g/s)} = 1120.95 \text{ g/d} \times 10\% / 6\text{hr/day} / 3600 \text{ s/hr}$

$\text{Emission Rate}_{\text{Xylene}} \text{ (g/s)} = 0.016 \text{ g/s}$

Appendix A - Estimate of Direct and Indirect Annual Costs associated with the Toxic Substance.

S. 18(1) of O. Reg. 455/09 requires that direct and indirect costs be estimated for the Toxic Substance for which the Plan is being prepared. A Facility has the flexibility to determine how and to what level of detail to calculate direct and indirect costs. The MOE indicates that an understanding of direct and indirect costs associated with a prescribed toxic substance will assist the Facility in assessing the economic feasibility of identified toxic substance reduction options

The table below provides categories, descriptions and associated costs for costs that may be associated with the Toxic Substance. Information contained in the table below was provided by Facility personnel and represents an appropriate level of detail for this cost estimating exercise.

Cost Category	Cost Item Description	Cost Associated with Toxic Substance	
		Xylene	Ethyl benzene
Raw Materials	Purchase of Paint	\$515.88	\$51.58
Operation Costs	Labor	\$6,900	\$690.00
Health and Safety costs	PPE & training	\$5,818.54	\$581.85
Process Area	Testing and Sampling	\$270.00	\$27.00
Total costs		\$13,504.42	\$1350.43

Costs per toxic substance determined by taking the capital allocated towards the function, and multiplying it by the concentration of the Toxic Substance within the product.

Appendix B: Planner Recommendations and Rationale



TECHNICAL MEMORANDUM

Greenflow Environmental Services (Greenflow) was retained by Marswell Metal Industries Ltd. (the Facility) to provide various services pertaining to Phase I Toxic Substance Reduction Plan preparation under the *Toxics Reduction Act* (TRA), including Toxic Substance Reduction Planner Recommendations (Planner Recommendations).

As required by s. 18.2 of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 10 of O. Reg. 214/11), a facility is required to provide a draft copy of the Plan to a licensed Toxic Substance Reduction Planner (the Planner) for the purpose of obtaining recommendations with respect to the Plan. This document fulfills the requirements of s. 18.2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) for the draft document entitled "Toxic Substance reduction Plan – Xylene Version 1.0" (the Plan) which has been prepared for the prescribed toxic substance referred to as Lead (the Toxic Substance).

Planner Recommendation Requirements Under the TRA and O. Reg. 455/09

Section 18.2(3) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) provides the areas of a given Plan in which Planner Recommendations are required to be documented (the Areas of Recommendation). As required by s. 18.2(4) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11), a Planner must also provide a rationale for each Planner Recommendation. Implementing the Planner Recommendations (if any) is voluntary.

As stated in s. 18.2(2) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11), Planner Recommendations shall be provided for the purpose of improving all aspects of the Plan, including:

- The potential for reducing the use and creation of the toxic substance at the facility; and
- The business rationale for implementing the Plan

S. 18.2(5) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) a Planner must provide a written explanation if the Planner is of the opinion that no recommendations are necessary with respect to any of the Areas of Recommendation.

Written Explanation for No Necessary Recommendations

The Planner is of the opinion that no recommendations are necessary with respect to any of the Areas of Recommendation within the Plan.

The following written explanation is being provided by the Planner to the Facility under s. 18.2(5) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) and satisfies the Facility's requirements for Planner Recommendations under s. 18.2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) pertaining to the Plan for the Toxic Substance:

Greenflow Environmental Services Inc.
4000, Main Street
Burlington, Ontario, Canada
L7R 4A1
1-800-387-1942



TECHNICAL MEMORANDUM

It is the opinion of the Planner that no recommendations are necessary with respect to any of the categories listed within paragraphs 1-6 of s. 18.2(3) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) for the Plan. The rationale being, after completing the TRA exercise for the Toxic Substance, the Facility is of the opinion that the Facility finds itself in a situation where options for reductions in its "use" of the Toxic Substance cannot be identified under the framework of the TRA. No obvious feasible toxic substance reduction options were revealed by undertaking the TRA exercise with respect to the Toxic Substance. With this information in mind, the Facility has not included within the Plan a statement of its intent to reduce its use of the Toxic Substance under the framework of the TRA. The Planner and the Facility feel that there is little value in providing Planner Recommendations on a Plan that the Planner feels is compliant, aside from the absent certification statements, and addresses all matters within the framework of the TRA and O. Reg. 455/09 for a substance whose use the Facility does not intend to reduce.

Closing Statement

This document provides the correct records required to satisfy s. 18, 2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) with respect to the draft Plan. It is recommended that a copy of this document be appended to the final version of the Plan.

Sincerely,

Greenflow Environmental Services Inc.



Mark Wiedener
Toxic Substance Reduction Planner
License No. TSRP0255

Greenflow Environmental Services Inc.
500 Main Street
Burlington, Ontario, Canada
L7R 5Y1
905.337.7666

Appendix C: Plan Summary

This Toxic Substance Reduction Plan Summary has been prepared in accordance with Section 8(2) of the *Toxics Reduction Act* and satisfies the minimum Plan Summary content requirements stipulated in Section 24 of Ontario Regulation (O. Reg.) 455/09

Basic Facility Information

Mandatory Basic Facility Information	Details
Substance Name and Chemical Abstracts Service (CAS) Registry Number for the Substance(s) whose Toxic Substance Reduction Plans are summarized by this Plan Summary	Xylene (CAS #: 1330-20-7)
National Pollutant Release Inventory (NPRI) Number	NPRI Id: 000000 - 4834
Legal and Trade names of the owner and the operator of the facility, street address of facility, and mailing address of facility if different	Marswell Metal Industries Ltd. 4140 Morris Drive. Burlington, Ontario, Canada L7L 5L6
Number of Full Time employee equivalents	16
Two-and four-digit North American Industry Classification System (NAICS) codes and the six-digit NAICS Canada code	33 – Manufacturing 3315 – Foundries 331529 – Non-ferrous foundries (except die-casting)
Public Contact	Mr. Kevin Milne Operations Manager Mars Metal Specialty Castings (address per above) (905) 637-3862
Spatial coordinates of facility expressed in UTM	UTM Zone 17 598835.24 E, 4802426.54 N
Parent Company Information	Marswell Metal Industries Ltd. 4140 Morris Drive Burlington, Ontario, Canada L7L 5L6 (905) 637-3862

List of All Substances for which Toxic Substance Reduction Plans Have Been Prepared at the Facility

The Facility has prepared Toxic Substance Reduction Plans for the following prescribed Toxic Substances:

- Lead *
- Antimony *
- Xylene (CAS number 1330-20-7)
- Ethyl Benzene (CAS number 100-41-4)

* = No single CAS number applies to these substances as per O. Reg. 455/09

Statement of Intent

A statement of the Facility's intent to reduce the use of the Toxic Substance has not been included as part of this Plan. The Toxic Substance is never created within the Facility's process and therefore no statement with respect to intent to reduce creation of the Toxic Substance is required.

The Toxic Substance has triggered reporting under the TRA and O.Reg 455/09 due to it being contained within the raw material that Mars Metal Company utilizes to create its finished product. There are 3 main "uses" of the Toxic Substance that take place within the facility; the first function, which can be defined as a "use", is the creation of the product by melting lead ingots, or large lead "pigs" in the melting furnaces. The second "use" of the Toxic Substance occurs when the melted lead is poured from one of the melting furnaces into a prefabricated mold where it is left to cool, and harden. As the lead hardens, it shrinks within the mold, leading to more small amounts of lead being added to the top of the mold. The final "use" of the raw material is in addition to the casting process; after the lead has hardened and has been removed from the mold, Mars Metals performs surface finishing on their products. Freshly cast products are subjected to surface grinding to remove any "burs", or inconsistencies, after which they may be coated with an epoxy resin and painted, although this can vary depending on the desire of the customer. As it is the raw material, the purchase of the product that is used within the Facility which contains the Toxic substance is a significant capital expenditure and therefore optimizing the use of the product which contains the Toxic substance is in the Facility's best interest as it is directly related to cost control. Throughout the course of achieving the current level of process and practice optimization with respect to the Toxic Substance and considering the above aspects which influence the Facility's use of the toxic substance, the Facility has considered many options to reduce its use of the Toxic Substance and has already completed internal assessments of some initiatives which could constitute toxic substance reduction options that could otherwise be identified for the purposes of this Plan. Some of these initiatives are mentioned within this Plan, however, they have not been provided as

toxic substance reduction options for the purposes of this Plan since they have previously been deemed not to be feasible or implemented. The sources of emissions include the three lead casting furnaces, the surface finishing area, and comfort heating.

Given the above information, the Toxic Substance flows through the Facility process without undergoing any chemical change and, due to its presence within the raw material, this Facility activity which the TRA has defined as a “use” of the Toxic Substance can only be reduced by reducing the Facility’s overall level of production. However, Mars Metals is acutely aware of the dangers that the Toxic Substance presents to the natural environment, and will continue to evaluate all opportunities to minimize the potential release of the Toxic Substance to outside sources. Mars Metals is currently working with the Ministry of the Environment to update its Certificate of Approval to ensure that they are operating in a transparent fashion.

Objectives of the Toxic Substance Reduction Plan

The objectives of this Plan are as follows:

- Provide support for the Facility’s position with respect to the Statement of Intent of this Plan; and
- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

Description of Why the Toxic Substance is Used or Created

As stated elsewhere in this plan, the Toxic Substance reporting under the TRA and O.Reg 455/09 was triggered due to a few activities at the Facility which involve the use of the Toxic Substance as its raw material. These activities are:

- The addition of Finishing Compounds to a molded keel
- The addition of water-resistant paint to the finished keel

After grinding, one of two coatings will be applied to the keel, an ATC Poly-Fair F26 or an Epoxy Tech 833-H. The Epoxy Tech product will be mixed with Tri-Text 0834H in a ratio of 5:1 respectively. The Poly-Fair will be mixed with Cadox L-50A in a ratio of 50:1 respectively. Both compounds will create a putty-like substance which is slathered onto the keel and smoothed out with a putty knife. The coating is used to fill any pores or imperfections on the surface of the keel. During normal production, 95% of the keels will be coated in the Poly-Fair mixture which takes < 1 hour to dry. The Epoxy Tech product will take up to 8 hours to dry. To calculate the emissions, two scenarios were considered:

- One (1) Epoxy Tech coated keel and Two (2) Poly Fair coated keels; and
- Three (3) Poly-Fair coated keels.

Since the compounds for the coatings do not overlap, we can assume one Epoxy Tech coated keel and three Poly-Fair coated keels are being processed simultaneously to remain conservative and to simplify the modeling.

Once the coating has dried, the keels will be sanded down to create a smooth, unblemished surface. Extra putty may be added to fill in any dents or blemishes. The final step before shipping the keels is to paint them in a water resistant paint. The paint is a mixture of Interprotect 2000E paint and Interprotect Curing product mixed at a ratio of 3:1 for the paint to curing product. The paint is applied by roller and left to dry overnight. After drying, the keel is moved to the shipping warehouse and stored until the end user is ready to receive it. By using a roller, there is no over-spray for the paint that is typically witnessed in spraying applications. Therefore the emissions from the painting process are limited to the solvents from the paint as it dries.

Rationale for Not Implementing Toxic Substance Reduction Options

As required by s. 18(4) of O. Reg. 455/09 (as amended by s. 9(3) of O. Reg. 214/11), a Plan must contain an explanation as to why no toxic substance reduction options will be implemented

Facility personnel have considered each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent section of this Plan, the Facility feels that no toxic substance reduction options can be identified in any of the seven toxic substance reduction categories.

Therefore, the rationale for not implementing toxic substance reduction options is that no toxic substance reduction options could be identified.

Statement that the Plan Summary Accurately Reflects the Current Version of the Plan

As required by s. 24(1)8 of O. Reg. 455/09 this Plan Summary accurately reflects the current version of the Plan.

Planner License Number

As required by s. 18(2) of O. Reg. 455/09 (as amended by s. 9(2) of O. Reg. 214/11), the Licensed Toxic Substance Reduction Planner responsible for providing Planner recommendation on and confirmation of this Plan as follows:

Mark Wiedener
Co-Owner/Vice President
Greenflow Environmental Sciences Inc.
Toxic Substance Reduction Planner License Number TSRP0255

Copies of the Confirmation

In lieu of the certification statements, this Plan has included confirmation statements which are provided on the following page.

Appendix D: Confirmation Statements



TECHNICAL MEMORANDUM

May 28, 2013

Mark Wiedener
Greenflow Environmental Services Inc.

LICENSED TOXIC SUBSTANCE REDUCTION PLANNER CERTIFICATION STATEMENT FOR PHASE I TOXIC SUBSTANCE REDUCTION PLANS FOR MARSWELL METAL INDUSTRIES LTD, INCLUDING ITS DIVISIONS MARSKEEL, MARS METAL SPECIALTY CASTINGS.

Dear Mr. Milne,

Greenflow Environmental Services Inc. (Greenflow) was engaged by Marswell Metal Industries Ltd. (the Facility) to provide guidance pertaining to Phase I Toxic Substance Reduction Plan preparation under the Toxics Reduction Act (TRA), including providing confirmation of Phase I Toxic Reduction Plans (the Plans).

The following Planner Confirmation Statement, which comes in lieu of the Planner Certification Statement required under s. 19, 1(4) of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 11 of O. Reg. 214/11) satisfies the requirements for the Plans that are assembled as a single document as of the date of this Planner Confirmation Statement. Furthermore, the following confirmation statement is limited to the respective versions of the Plans which are dated as indicated in the Certification Statement:

As of (May 28, 2013), I, Mark Wiedener confirm that I am familiar with the processes at the Marswell Metal Industries Ltd. Facility that use of create the toxic substances referred to below, that I agree with the estimates referred to in its contents, and it satisfies all other requirements, with the exception of the regulatory deadline as determined by the Toxic Reduction Act and Ontario Regulation 455/09.

- Xylene (May 28, 2013)


Mark Wiedener
Toxic Substance Reduction Planner
License No. TSRP 0255

May 28, 2013
Date

Greenflow Environmental Services Inc.
400 Main Street
Burlington, Ontario, Canada
L7R 1K1
1-800-367-5668



TECHNICAL MEMORANDUM

Toxic Substance Reduction Plans Confirmation by Highest Ranking Employee

As required by s. 4(2) of the *Toxics Reduction Act* (TRA), Toxic Substance Reduction Plans must contain a certification signed by the highest ranking employee at the Facility who has management responsibilities relating to the Facility.

As a result of the inability to meet the regulatory deadline of December 31, 2012, this Plan contains a confirmation statement from the highest ranking employee in lieu of the required certification statement:

As of (date) May 29, 2013, (insert name) KEVIN MILNE, confirm that I have read the toxic substance reduction plans for the toxic substances referred to below and am familiar with their contents, and to my knowledge the plans are factually accurate and comply with the *Toxics Reduction Act*, 2009 and Ontario Regulation 455/09 made under that Act, with the exception of the certification statements as a result of the inability of the Facility, in spite of its best efforts, to meet the December 31st regulatory deadline. This was mainly due to the Facility allocating time and resources towards updating ministry approvals with regard to air and seeking proper testing to aid in the creation of this document.

- Xylene (May 28, 2013)



Kevin Milne
President
Marswell Metal Industries Ltd.

May 29, 2013
Date

Greenflow Environmental Services Inc.
4350 Main Street
Burlington, Ontario, Canada
L7R 5C1
1-888-387-5414

Marswell Metal Industries Ltd.

**Toxic Substance
Reduction Plan**

**Ethyl Benzene
Version 1.0**

Document Version Control

This document constitutes the Toxic Substance Reduction Plan Version 1.0 for the prescribed toxic substance referred to as “Ethyl Benzene” under the *Toxics Reduction Act*. S.22 of the Ontario Regulation (O.Reg) 455/09 provides the framework for Plan review and requirements for a new version of the Plan. This plan satisfies all requirements contained within O.Reg. 455/09, except for the inclusion of the certification statements from the Highest Ranking Employee (HRE), as well as the licensed Toxic Substance Reduction (TSRP) Planner. This is due to the fact that Mars Metals, in spite of their best efforts, were unable to submit the Plan to the Ministry on, or before the prescribed deadline for Phase I toxic substances of December 31st, 2012. Unlike some other pieces of legislation, the TRA does not provide Ministry staff with the authority to change the reporting deadlines, and on the advice of Ontario’s Toxic Substance Reduction Programs administration, in place of the certification statements, this document will include a confirmation statement from the HRE at the Facility, as well as a confirmation statement from the licensed TSRP Planner.

This plan is to be updated by the end of the calendar year in which a significant change in processes (as defined in s. 1(3) of O.Reg 455/09) has occurred. The first mandatory Plan update is required to be completed by December 31st, 2018.

Future updates of this Plan will be assigned a new version number.

Version	Date	Revision Description	Reviewed by (Facility Contact)
1.0	May 29, 2013	TSRP Version 1.0	Kevin Milne

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Appendices

Executive Summary

This Toxic Substance Reduction Plan (the Plan) was prepared in accordance with s.3 of the *Toxics Reduction Act* (TRA) and s.9 of the Ontario Regulation (O.Reg.) 455/09 for the prescribed toxic substance referred to as “Ethyl Benzene” (the Toxic Substance) for Mars Metal Specialty Castings, MarsKeel & MarShield – a division of Marswell Metal Industries. The services of these divisions include: pattern making, mold manufacturing, custom/production castings, priming, and painting. The facility is located at 4140 Morris Drive in Burlington, Ontario. The main products produced are counterweights, alloyed lead, certified nuclear castings, and keels for the sailing industry. The facility operates from 6:30AM – 6:30 PM Monday to Thursday, and 6:30AM – 5:30PM on Fridays. Production does not occur during weekend hours. Guidance within the Ontario Ministry of the Environment (MOE) publication *Toolkit for Toxic Substance Reduction Planning*, version from February 15th, 2012 (the MOE Planning Toolkit) was followed, as appropriate, during the making of this document.

The TRA was passed in the Ontario Legislature in June 2009. The MOE has stated that the goal of the TRA is to promote reductions in the use and creation of prescribed toxic substances, inform Ontarians about toxic substances in their communities and to help ensure that Ontario is properly positioned to be competitive within the global economy, which has been placing greater emphasis on ‘green initiatives’.

The TRA is intended so that regulated facilities give a consistent level of consideration to opportunities for reducing, or eliminating, where possible, the prescribed substances; however, it does not restrict or require elimination of prescribed toxic substances.

Under the TRA, regulated facilities are required to:

- Perform quantification, accounting and reporting on the toxic substance use, creation, amount contained product, and release at the Facility on an annual basis;
- Prepare Toxic Substance Reduction Plans in which it is documented, where feasible, how the use and creation of toxic substances might be reduced;
- Have the Toxic Substance Reduction Plan certified by an MOE licensed Toxic Substance Reduction Planner (the Planner) as well as the Highest Ranking Employee (HRE) at the Facility;
- Prepare Plan Summaries containing various components of the Toxic Substance Reduction Plans and make them available to the public;
- Submit annual reports on progress made on the Plans; and
- Update the Plans at least every five years.

Unlike tracking, accounting, reporting and preparation of a Toxic Substance Reduction Plan, which are all requirements; the implementation of any toxic substance reduction

options identified in the Plan is not a requirement of the TRA or O.Reg. 455/09. The Facility is captured by the requirements of the TRA pertaining to the Toxic Substance since the Facility meets the TRA's definition of target facilities within North American Industry Classification System (NAICS) codes by falling under the NAICS code 331529 (Non-Ferrous foundries – except die-casting) and falls under Schedule 3 of O.Reg. 419/05, thus AERMOD will be used to model the emissions from Mars Metal's facility.

The main emissions from this site are from the lead casting process and the product finishing process, with a small amount of emissions being from the comfort heating. A source testing program was conducted between August 15th and August 24th of 2011 to evaluate the emissions produced by the lead casting process. Mars Metal has operated previously under Certificate of Approval (Air) 8-3385-94-997. The Facility was inspected by the Ministry of the Environment local Halton district office and an order was issued to update the Certificate of Approval.

A Toxic Substance Reduction Plan Component Checklist (the Plan Component Checklist), which outlines the minimum content requirements of a Toxic Substance Reduction Plan, is provided following this Executive Summary. This Plan is structured so that section headings correspond to the items in the Plan Component Checklist. This approach is designed to provide a clear depiction of this Plan's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09.

S.4(1) of the TRA requires that a Plan include either a statement of the Facility's intent to reduce the use and/or creation of the Toxic Substance at the Facility, or the reasons for not including this statement, as well as objectives of the Plan.

The Toxic Substance has triggered reporting under the TRA and O.Reg. 455/09 due to two activities at the Facility which are defined as "uses" of the Toxic Substance under the TRA Framework. These two "uses" are:

- Product finishing
- Comfort Heating

Since the Toxic Substance for which this plan is being completed is not "created" at the Facility, but instead is an ingredient within some of the finishing products utilized within the Facility, this Plan does not intend to address the reduction in the "creation" of the Toxic Substance, as the only feasible way to accomplish this would be to reduce production levels. In light of the aforementioned information, the objectives of this Plan are as follows:

- Provide support for the Facility's position with respect to the Statement of Intent of this Plan; and

- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

A Plan Summary corresponding to this Plan, which was prepared in accordance with s.23 of O.Reg 455/09 is included as Appendix C of this Plan. Information contained in this Plan summary has been provided to the MOE through the 'Single Window' reporting system. Furthermore, the Plan is available on Mars Metal's website and can be provided to a member of the public upon written request.

This Plan documents the Facility's compliance with the Toxic Substance Reduction Plan requirements of the TRA and O.Reg. 455/09. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

1.0 Introduction

Refer to Master Document Section 1.0

2.0 Basic Facility Information

Refer to Master Document section 2.0

3.0 Planner License Number

Refer to Master Document Section 3.0

4.0 Statement of Intent and Objectives of the Plan

Refer to Master Document Section 4.0

5.0 Toxic Substance Accounting, Quantification, and Reporting Information

Refer to Master Document (Xylene) Section 5.0 and its subsections.

6.0 Estimate of Direct and Indirect Annual Costs Associated with the Toxic Substance

As required by s. 18(1) of O. Reg. 455/09, direct and indirect costs have been estimated for the Toxic Substance. In preparing cost estimates, several departments at the Facility were consulted. Cost items associated with the toxic substance were identified and fit into the following categories:

- Raw Materials; and
- General Facility Costs

The cost estimates along with comments are provided in Appendix A – Estimate of Direct and Indirect Annual Costs associated with the Toxic Substance.

O. Reg. 455/09 does not specify the level of detail to which a Facility must examine costs associated with a toxic substance, however, the Facility feels that it has gone to reasonable lengths in its efforts to estimate the costs associated with the Toxic Substance.

7.0 Options Considered for Reduction

Please refer to Master Document (Xylene) section 7.0 and its subsections.

8.0 Rationale for not Implementing Toxic Substance Reduction Options

Please refer to Master Document (Xylene) section 8.0.

9.0 Planner Recommendations and Rationale.

Please refer to Master Document (Xylene) section 9.0

10.0 Plan Summary

As required by s. 8 of the TRA, a Plan Summary in accordance with s. 23 of O. Reg 455/09 is included in Appendix C – Plan Summary. Information contained in the Plan summary has been provided to the MOE through the “Single Window” reporting system.

Additionally, the Plan Summary is available on Marswell Metal Industries’ website and can be provided to a member of the public upon written request. The Facility is required to submit annual reports to the MOE on progress made on this Plan and update the Plan at least every five years.

11.0 Certifications

In spite of the Facility’s best efforts, it was unable to complete the requirements of the TRA before the deadline of December 31st, 2012. As a result, and in accordance with the TRA, this plan falls outside compliance in that regard and therefore cannot be certified as such. In this situation, the MOE has recommended that the Toxic Substance Reduction Planner should confirm in writing, with signature, that s/he is familiar with the processes at the facility, agrees with the estimates of reduction (if any) for those options that will be implemented (if any) and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

The highest ranking employee should provide a rationale as to why the December 31st, 2012 deadline was not met. In addition, s/he should confirm in writing, with signature, that s/he has read the plan, is familiar with its and, to his/her knowledge, the plan is factually accurate and, with the exception of the regulatory deadline, the plan meets all other requirements of the act and regulation.

These confirmation statements have been attached at the end of this Plan as Appendix D – Confirmation Statements from the Planner and Highest Ranking Employee.

Figure 2: Calculations, Emissions Analysis and Summary s.

5.2.1

Product	Component	% by weight (%)	Max Emission (g/day per keel)	MOE POI Limit ($\mu\text{g}/\text{m}^3$)	ER (g/s)	Emission Threshold
Interprotect 2000 E Grey	Ethyl Benzene	0.1-1	11.21	1000	2.34 E-03	12111.02
Interprotect 2000E Cure	Ethyl Benzene	1-10	0.021	1000	4.28 E-06	12111.02

Based on personal communication with Mars Metal, it takes up to 1 quart of paint to paint the keels. The Facility uses a paint which is a 3:1 mix of Interproct 2000E Grey and Interprotect Cure. Since the paint is rolled on, there is no overspray or TSP emissions. The VOC were therefore based on the vapour pressure of each compound as per table B3 from the "Procedure for Preparing an ESDM Report" where any compound with a vapour pressure < 1 kPa at low temperatures can be considered negligible.

To calculate the Ethyl Benzene emissions from the paint, the following calculations were used:

$$\text{Usage}_{\text{Paint}} (\text{g/d}) = \text{Total usage L/day} \times \text{ratio of product} \times \text{Density}$$

$$\text{Usage}_{\text{Paint}} (\text{g/d}) = 0.94\text{L} \times 3 \text{ part paint} / 4 \text{ parts total} \times 1.59 \text{ g/ml}$$

$$\text{Usage}_{\text{Paint}} (\text{g/d}) = 1120.95 \text{ g/day}$$

$$\text{Emission Rate}_{\text{Ethyl Benzene}} (\text{g/s}) = \text{Usage} (\text{g/d}) \times \% \text{ mass}_{\text{Xylene}} \times \text{Drying Time} (\text{hr/day})$$

$$\text{Emission Rate}_{\text{Ethyl Benzene}} (\text{g/s}) = 1120.95 \text{ g/d} \times 1\% / 6\text{hr/day} / 3600 \text{ s/hr}$$

$$\text{Emission Rate}_{\text{Ethyl Benzene}} (\text{g/s}) = 0.0016 \text{ g/s}$$

Appendix A - Estimate of Direct and Indirect Annual Costs associated with the Toxic Substance.

S. 18(1) of O. Reg. 455/09 requires that direct and indirect costs be estimated for the Toxic Substance for which the Plan is being prepared. A Facility has the flexibility to determine how and to what level of detail to calculate direct and indirect costs. The MOE indicates that an understanding of direct and indirect costs associated with a prescribed toxic substance will assist the Facility in assessing the economic feasibility of identified toxic substance reduction options

The table below provides categories, descriptions and associated costs for costs that may be associated with the Toxic Substance. Information contained in the table below was provided by Facility personnel and represents an appropriate level of detail for this cost estimating exercise.

Cost Category	Cost Item Description	Cost Associated with Toxic Substance	
		Xylene	Ethyl benzene
Raw Materials	Purchase of Paint	\$515.88	\$51.58
Operation Costs	Labor	\$6,900	\$690.00
Health and Safety costs	PPE & training	\$5,818.54	\$581.85
Process Area	Testing and Sampling	\$270.00	\$27.00
Total costs		\$13,504.42	\$1350.43

Costs per toxic substance determined by taking the capital allocated towards the function, and multiplying it by the concentration of the Toxic Substance within the product.

Appendix B: Planner Recommendations and Rationale



TECHNICAL MEMORANDUM

It is the opinion of the Planner that no recommendations are necessary with respect to any of the categories listed within paragraphs 1-6 of s. 18.2(3) of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) for the Plan. The rationale being, after completing the TRA exercise for the Toxic Substance, the Facility is of the opinion that the Facility finds itself in a situation where options for reductions in its "use" of the Toxic Substance cannot be identified under the framework of the TRA. No obvious feasible toxic substance reduction options were revealed by undertaking the TRA exercise with respect to the Toxic Substance. With this information in mind, the Facility has not included within the Plan a statement of its intent to reduce its use of the Toxic Substance under the framework of the TRA. The Planner and the Facility feel that there is little value in providing Planner Recommendations on a Plan that the Planner feels is compliant, aside from the absent certification statements, and addresses all matters within the framework of the TRA and O. Reg. 455/09 for a substance whose use the Facility does not intend to reduce.

Closing Statement

This document provides the correct records required to satisfy s. 18.2 of O. Reg. 455/09 (as amended by s. 10 of O. Reg. 214/11) with respect to the draft Plan. It is recommended that a copy of this document be appended to the final version of the Plan.

Sincerely,

Greenflow Environmental Services Inc.



Mark Wiedner
Toxic Substance Reduction Planner
License No. TSRP0255

Greenflow Environmental Services Inc.
4021 Markham Drive
Burlington, Ontario, Canada
L7R 6A1
(905) 607-0440

Appendix C: Plan Summary

This Toxic Substance Reduction Plan Summary has been prepared in accordance with Section 8(2) of the *Toxics Reduction Act* and satisfies the minimum Plan Summary content requirements stipulated in Section 24 of Ontario Regulation (O. Reg.) 455/09

Basic Facility Information

Mandatory Basic Facility Information	Details
Substance Name and Chemical Abstracts Service (CAS) Registry Number for the Substance(s) whose Toxic Substance Reduction Plans are summarized by this Plan Summary	Ethylbenzene (CAS #:100-41-4)
National Pollutant Release Inventory (NPRI) Number	NPRI Id: 000000 - 4834
Legal and Trade names of the owner and the operator of the facility, street address of facility, and mailing address of facility if different	Marswell Metal Industries Ltd. 4140 Morris Drive. Burlington, Ontario, Canada L7L 5L6
Number of Full Time employee equivalents	16
Two-and four-digit North American Industry Classification System (NAICS) codes and the six-digit NAICS Canada code	33 – Manufacturing 3315 – Foundries 331529 – Non-ferrous foundries (except die-casting)
Public Contact	Mr. Kevin Milne Operations Manager Mars Metal Specialty Castings (address per above) (905) 637-3862
Spatial coordinates of facility expressed in UTM	UTM Zone 17 598835.24 E, 4802426.54 N
Parent Company Information	Marswell Metal Industries Ltd. 4140 Morris Drive Burlington, Ontario, Canada L7L 5L6 (905) 637-3862

List of All Substances for which Toxic Substance Reduction Plans Have Been Prepared at the Facility

The Facility has prepared Toxic Substance Reduction Plans for the following prescribed Toxic Substances:

- Lead *
- Antimony *
- Xylene (CAS number 1330-20-7)
- Ethyl Benzene (CAS number 100-41-4)

* = No single CAS number applies to these substances as per O. Reg. 455/09

Statement of Intent

A statement of the Facility's intent to reduce the use of the Toxic Substance has not been included as part of this Plan. The Toxic Substance is never created within the Facility's process and therefore no statement with respect to intent to reduce creation of the Toxic Substance is required.

The Toxic Substance has triggered reporting under the TRA and O.Reg 455/09 due to it being contained within the raw material that Mars Metal Company utilizes to create its finished product. There are 3 main "uses" of the Toxic Substance that take place within the facility; the first function, which can be defined as a "use", is the creation of the product by melting lead ingots, or large lead "pigs" in the melting furnaces. The second "use" of the Toxic Substance occurs when the melted lead is poured from one of the melting furnaces into a prefabricated mold where it is left to cool, and harden. As the lead hardens, it shrinks within the mold, leading to more small amounts of lead being added to the top of the mold. The final "use" of the raw material is in addition to the casting process; after the lead has hardened and has been removed from the mold, Mars Metals performs surface finishing on their products. Freshly cast products are subjected to surface grinding to remove any "burs", or inconsistencies, after which they may be coated with an epoxy resin and painted, although this can vary depending on the desire of the customer. As it is the raw material, the purchase of the product that is used within the Facility which contains the Toxic substance is a significant capital expenditure and therefore optimizing the use of the product which contains the Toxic substance is in the Facility's best interest as it is directly related to cost control. Throughout the course of achieving the current level of process and practice optimization with respect to the Toxic Substance and considering the above aspects which influence the Facility's use of the toxic substance, the Facility has considered many options to reduce its use of the Toxic Substance and has already completed internal assessments of some initiatives which could constitute toxic substance reduction options that could otherwise be identified for the purposes of this Plan. Some of these initiatives are mentioned within this Plan, however, they have not been provided as

toxic substance reduction options for the purposes of this Plan since they have previously been deemed not to be feasible or implemented. The sources of emissions include the three lead casting furnaces, the surface finishing area, and comfort heating.

Given the above information, the Toxic Substance flows through the Facility process without undergoing any chemical change and, due to its presence within the raw material, this Facility activity which the TRA has defined as a “use” of the Toxic Substance can only be reduced by reducing the Facility’s overall level of production. However, Mars Metals is acutely aware of the dangers that the Toxic Substance presents to the natural environment, and will continue to evaluate all opportunities to minimize the potential release of the Toxic Substance to outside sources. Mars Metals is currently working with the Ministry of the Environment to update its Certificate of Approval to ensure that they are operating in a transparent fashion.

Objectives of the Toxic Substance Reduction Plan

The objectives of this Plan are as follows:

- Provide support for the Facility’s position with respect to the Statement of Intent of this Plan; and
- Document how, by preparing this Plan, the Facility has fulfilled the applicable requirements under the TRA and O.Reg. 455/09 with respect to the Toxic Substance.

Description of Why the Toxic Substance is Used or Created

As stated elsewhere in this plan, the Toxic Substance reporting under the TRA and O.Reg 455/09 was triggered due to a few activities at the Facility which involve the use of the Toxic Substance as its raw material. These activities are:

- The addition of Finishing Compounds to a molded keel
- The addition of water-resistant paint to the finished keel

After grinding, one of two coatings will be applied to the keel, an ATC Poly-Fair F26 or an Epoxy Tech 833-H. The Epoxy Tech product will be mixed with Tri-Text 0834H in a ratio of 5:1 respectively. The Poly-Fair will be mixed with Cadox L-50A in a ratio of 50:1 respectively. Both compounds will create a putty-like substance which is slathered onto the keel and smoothed out with a putty knife. The coating is used to fill any pores or imperfections on the surface of the keel. During normal production, 95% of the keels will be coated in the Poly-Fair mixture which takes < 1 hour to dry. The Epoxy Tech product will take up to 8 hours to dry. To calculate the emissions, two scenarios were considered:

- One (1) Epoxy Tech coated keel and Two (2) Poly Fair coated keels; and
- Three (3) Poly-Fair coated keels.

Since the compounds for the coatings do not overlap, we can assume one Epoxy Tech coated keel and three Poly-Fair coated keels are being processed simultaneously to remain conservative and to simplify the modeling.

Once the coating has dried, the keels will be sanded down to create a smooth, unblemished surface. Extra putty may be added to fill in any dents or blemishes. The final step before shipping the keels is to paint them in a water resistant paint. The paint is a mixture of Interprotect 2000E paint and Interprotect Curing product mixed at a ratio of 3:1 for the paint to curing product. The paint is applied by roller and left to dry overnight. After drying, the keel is moved to the shipping warehouse and stored until the end user is ready to receive it. By using a roller, there is no over-spray for the paint that is typically witnessed in spraying applications. Therefore the emissions from the painting process are limited to the solvents from the paint as it dries.

Rationale for Not Implementing Toxic Substance Reduction Options

As required by s. 18(4) of O. Reg. 455/09 (as amended by s. 9(3) of O. Reg. 214/11), a Plan must contain an explanation as to why no toxic substance reduction options will be implemented

Facility personnel have considered each of the seven categories for toxic substance reduction options, and, in light of the information provided in the Statement of Intent section of this Plan, the Facility feels that no toxic substance reduction options can be identified in any of the seven toxic substance reduction categories.

Therefore, the rationale for not implementing toxic substance reduction options is that no toxic substance reduction options could be identified.

Statement that the Plan Summary Accurately Reflects the Current Version of the Plan

As required by s. 24(1)8 of O. Reg. 455/09 this Plan Summary accurately reflects the current version of the Plan.

Planner License Number

As required by s. 18(2) of O. Reg. 455/09 (as amended by s. 9(2) of O. Reg. 214/11), the Licensed Toxic Substance Reduction Planner responsible for providing Planner recommendation on and confirmation of this Plan as follows:

Mark Wiedener
Co-Owner/Vice President
Greenflow Environmental Sciences Inc.
Toxic Substance Reduction Planner License Number TSRP0255

Copies of the Confirmation

In lieu of the certification statements, this Plan has included confirmation statements which are provided on the following page.

Appendix D: Confirmation Statements



TECHNICAL MEMORANDUM

May 28, 2013

Mark Wiedener
Greenflow Environmental Services Inc.

LICENSED TOXIC SUBSTANCE REDUCTION PLANNER CERTIFICATION STATEMENT FOR PHASE I TOXIC SUBSTANCE REDUCTION PLANS FOR MARSWELL METAL INDUSTRIES LTD, INCLUDING ITS DIVISIONS MARSKEEL, MARS METAL SPECIALTY CASTINGS.

Dear Mr. Milne,

Greenflow Environmental Services Inc. (Greenflow) was engaged by Marswell Metal Industries Ltd. (the Facility) to provide guidance pertaining to Phase I Toxic Substance Reduction Plan preparation under the *Toxics Reduction Act* (TRA), including providing confirmation of Phase I Toxic Reduction Plans (the Plans).

The following Planner Confirmation Statement, which comes in lieu of the Planner Certification Statement required under s. 19, 1(4) of Ontario Regulation (O. Reg.) 455/09 (as amended by s. 11 of O. Reg. 214/11) satisfies the requirements for the Plans that are assembled as a single document as of the date of this Planner Confirmation Statement. Furthermore, the following confirmation statement is limited to the respective versions of the Plans which are dated as indicated in the Certification Statement:

As of (May 28, 2013), I, Mark Wiedener confirm that I am familiar with the processes at the Marswell Metal Industries Ltd. Facility that use or create the toxic substances referred to below, that I agree with the estimates referred to in its contents, and it satisfies all other requirements, with the exception of the regulatory deadline as determined by the Toxic Reduction Act and Ontario Regulation 455/09.

- Ethyl Benzene (May 28, 2013)


Mark Wiedener
Toxic Substance Reduction Planner
License No. TSPR 0255

MAY 29, 2013
Date

Greenflow Environmental Services Inc.
855, Avenue 100
Burlington, Ontario, Canada
L7R 3R3
1-800-267-5444



TECHNICAL MEMORANDUM

Toxic Substance Reduction Plans Confirmation by Highest Ranking Employee

As required by s. 4(2) of the *Toxics Reduction Act (TRA)*, Toxic Substance Reduction Plans must contain a certification signed by the highest ranking employee at the Facility who has management responsibilities relating to the Facility.

As a result of the inability to meet the regulatory deadline of December 31, 2012, this Plan contains a confirmation statement from the highest ranking employee in lieu of the required certification statement:

As of (date) May 29, 2013, I, (insert name) KEVIN MILNE, confirm that I have read the toxic substance reduction plans for the toxic substances referred to below and am familiar with their contents, and to my knowledge the plans are factually accurate and comply with the *Toxics Reduction Act, 2009* and *Ontario Regulation 455/09* made under that Act, with the exception of the certification statements as a result of the inability of the Facility, in spite of its best efforts, to meet the December 31st regulatory deadline. This was mainly due to the Facility allocating time and resources towards updating ministry approvals with regard to air and seeking proper testing to aid in the creation of this document.

- Ethyl Benzene (May 28, 2013)



Kevin Milne
President
Marswell Metal Industries Ltd.

May 29, 2013
Date

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