LONG HARBOUR - MOUNT ARLINGTON HEIGHTS SERVICE CENTRE
ENVIRONMENTAL REGISTRATION DOCUMENT

November 23, 2016

Eastern
Composite Services

Government of Newfoundland and Labrador
Minister of Environment and Climate Change
PO. Box 8700
St. John's NL, A1B 4J6

Attention: Director of Environmental Assessment

November 14, 2016

Re: **REGISTRATION OF AN UNDERTAKING**

Please accept the following package which outlines our intention to relocate our business in Long Harbour - Mount Arlington Heights and continue to provide services to the mining and oil and gas industries in NL. It is our intention to move all our services to a new location which include speciality services in fiberglass, rubber lining, plastic lining and anode maintenance. Eastern Composites has been operating from three locations over the past number of years and wish to consolidate under one roof. In reviewing the environmental assessment guidelines it is clear that only some of our services would trigger an assessment however we are making application to include all our services.

The areas of our operation which would be of concern to the Department of Environment and Climate Change would be our use of resins in our fiberglass operation and our painting and coating services. It is important to note that the styrene emission levels produced by frp resin and in our operation is very insignificant with 18 ppm being the peak during curing with emissions disapating by 94% over 15 minutes. The volume of resin used in a single fiberglass bond is measured in milliliters and the number of lamination occurrences at this facility will be very small compared to a large scale production facility. It is noted that Styrene can be smelled at levels of 1 to 2 ppm, which is harmless, non-irritating but annoying to some.

We also wish to highlight our R&D project related to anode services. We intend to operate a small 380 ft^2 ($35m^2$) lab and 2,500 ft^2 ($230m^2$) pilot test area to develop a process for potential commercializing regarding anode servicing. We will collect all waste streams during this research period and will dispose off-site using licenced waste handling facilities.

This registration will outline the use of resin for fiberglass and demonstrate that the level of odor and potential nuisance risk is low. We will also highlight our use of other materials, equipment and processes which may cause concern to the Department of Enviroment and Climate Change. Due to our previous experience our existing business systems and the location of this undertaking, we trust the Minster will review our registration document favourably resulting in a release from the assessment process.

Sincerely,

Andrew Colford
Managing Director

Table of Contents

Corporate Background

Eastern Composite Services Inc. (ECS) is a local Newfoundland and Labrador company established in 2013 by Maher Group of Companies and Power Corporation. The principal owner of ECS has a 40+ year business history in the Placentia – Argentia – Long Harbour - Mount Arlington Heights area.

Specialty Piping, Tanks and Equipment Services

Fiberglass

With an established and long standing partnership with RPS Composites, ECS provides trained and certified fiberglass technicians. With trained staff in both ASME 31-3 (Piping) and RTP-1(Tanks) ECS is registered through Service NL for work on pressure pipe as well as offering inspection services.

Our services includes training, tank and pipe repairs. Our 3,750 ft^2 (350m^2)shop is complete with air monitoring systems and proper ventilation.

Rubber Lining

With an established partnership with ProCo, the ECS facility will operate two steam fired autoclaves, cutting tables, paint and blast booths.

Our facility will be able to complete shop rubber services on pipe, tanks and equipment. In addition to these specialty pipe services we have a qualified team to provide: Testing Services; Inspection Services; and Field Repairs.

Anode Handling, Service and Materials Management

An anode is a 3ft x 5ft (91cm x 150cm) titantium sheet with a specialize coating applied and a plastic box and filter bag. The reaction between the anode and cathode in the refinery assists in the production of nickel. There are 14,000 anodes in use. ECS has provided material handling and storage of all anode assemblies and components for Vale in NL for the past six years. This included transporting anodes, storing, tracking and monitoring. Our material handling systems are designed to ensure safe and efficient handling of the assemblies. The information systems developed support increased traceability and maintenance tracking of blade assemblies. Our services include receiving new and used anode blades and assembly and disassembly of all components.

Anode Stripping R&D Program

We intend to test a concept of stripping catalytic coatings from anodes using a unique combination of customized Molten Salt Bath (MSB) treatments followed by treating the cleaned substrate with Hydrochloric acid (HCl).

Our research will focused around the various inputs and possible by-products generated as a consequence of a molten salt bath and chemical stripping process. This analysis will include a thorough

identification of all reagents, by-products and resulting chemicals/effluents in addition to their corresponding properties; particularly with regard to hazard identification, handling, disposal, accident release, etc. All discharge will be handled through approved third party contractors.

REGISTRATION OF THE UNDERTAKING

NAME OF UNDERTAKING: Long Harbour - Mount Arlington Heights Service Center.

PROPONENT:

Name: Eastern Composite Services Inc

I. Name: Eastern Compiste Services Inc (ECS)

II. Address: 702 Water Street, St. John's, NL A1E 1C1

III. Chief Executive Officer

Name:	Adrian Maher
Official Title:	President
Address:	702 Water Street, St. John's, NL A1E 1C1
Telephone:	709-753-7330
Email:	edm@mahergroup.ca

IV. Principle Contact

Name:	Andrew Colford
Official Title:	Managing Director
Address:	702 Water Street, St. John's, NL A1E 1C1
Telephone:	709-753-7330
Email:	andrew@easternservices.ca

THE UNDERTAKING:

I. Name of the Undertaking: Long Harbour - Mount Arlington Heights Service Center

II. Purpose for the Undertaking: ECS has been developing its specialized services in a number of facilities at the Port of Argentia and in the Town of Placentia. In Janurary the company was awarded an anode service contract and began operating in the building currently under consideration. It is the intention of the proponent to consolidate all its services to the location in Long Harbour - Mount Arlington Heights. As a result of moving its fiberglass and rubber lining services ECS is required to register with the Department. It is our intention to return the leased properties back to the landlord at the end of their lease terms.

DESCRIPTION OF THE UNDERTAKING:

I. Geographic Location: ECS is proposing to establish a service center in a 30,000 ft^2 building (2,800m^2) on a 6 acre property at 542 Long Harbour Road (corner of route 101 & 202). The area is zoned light industrial and ECS currently has occupancy from the Town of Long Harbour - Mount Arlington Heights. The property is completely isolated from the Town of Long Harbour -

Mount Arlington Heights and is approximately 2.5 KM away from the community.

The property is surrounded by Crown Land or property owned by Vale. To the north of this property on the other side of Route 201 is a parcel of land that is owned by the proponent. Currently there is a small vacant warehouse building and vacant lot. Any future leases will be made with the tenants having full knowledge of the operations at the Long Harbour Service Center. With the exception of this building the closest neighbor is approximately 8KM. To the east and west of the property there are no neighbours within 10 KM. To the south approximately, 2.5 KM away is the entrance to the Vale plant site. South west of the property is the start of the Town of Long Harbour - Mount Arlington Heights approximately 2.5KM away. The first property in Town is a local metal fabrication shop. The property is not located near any other properties to cause any issues with local residents.

See attached map, real property report and some pictures of the building and surrounding area.

II. Physical Features: This single story warehouse building was constructed in 2015 and has a floor area of 30,000 ft^2 (2,800m^2) and a floor to roof height of 24 ft (7.3m). It was designed and built for a warehouse with an open concept and is a combination of a concrete and steel structure. Inside the building 7,500 ft^2 (799m^2) has been developed. Part of the developed space includes a 3,750 ft^2 (350m^2) fiberglass shop and 3,750 ft^2 (350m^2) of utility space (mechanical/electrical, lab facilities, lunchroom, locker room, washroom facilities and one office). A proposed 2,400 ft^2 (222m^2) office complex is proposed for outside the building. One of the drawings attached shows the proposed location of the office space and its promixmity to the ventilation system of the frp shop. The site is located away from possible POI or receptors and away from the prevailing winds.

All existing building structures have been designed and approved by Government Services. See attached drawings and building information.

III. Construction: The building was built in 2015 and was originally designed and built as a cold storage warehouse. The current plan is to maintain as much open space as possible inside the building. There may be a requirement at some time in the future to enclose the rubber shop. The next three months of construction will be restricted to service upgrades (HVAC, electrical upgrade, air handling and additional office space. The office space will be modular construction and will be build off site and transported to site.

See appendices for pictures of the existing building and construction drawings primarily for electrical and mechanical systems and a floor drawing highlighting the main areas of the building and it function.

Operation: The building is currently being used as a warehouse and transshipment facility for our anode services contract. Our regular effluent waste (sewage) will be handle through our approved sewage disposal system for this building.

As previously mentioned it is our intention to relocate our existing facilities in Argentia to this building in Long Harbour. Due to the location of our project and the fact that there is no other

business, dwelling or property in close proximity (2.5KM) and our pollution levels are negilible we do not forsee any conflicts.

Fiberglass Services

The relocation of the fiberglass shop will result in us reducing our existing shop space from 10,000 ft^2 (930m^2) to 3,750 ft^2 (350m^2). The focus of our shop will include training fiberglass bonders as well as light assembly and modification work. It is difficult to determine the amount of frp work that will be required in our shop. Most of our frp bonding is done in the field. Based on our current experience we are reducing our shop size. We do not forsee more than 5-10 joints per month on average being done in the shop. There is limited amount of training required going forward. Mostly recertification and would be considered in our average number of joints per month.

There are a couple of sources of pollutants possible from our fiberglass operations. The discharge of low concentrations of styrene which will be released into the air. The amount of styrene required to trigger an air discharge event is not typical in an operation of this size and scope. Any containers, excess or expired materials will be disposed of in accordance to Government Regulations and as stated on the respective MSDS sheets. Another pollutant to consider is fiberglass dust particples which will be collected by our dust collection equipment. Its filters are maintained by a maintenance schedule and the residual dust will be disposed of in accordance to Government Regulations.

We will be handling very small volumes of styrene, which is the odor-causing compound in fiberglass. In the unlikely event of a spill we have developed procedures to handle any clean up of styrene spills. There are special compounds such as clay and dry sand, which will absorb spilled solvents. Cleanup of large spills will involve specific response procedures. All consumables (hazard and non hazard) will be disposed of according to our HSE policies and procedures. There are no unusual procedures identified in our manual and we use MSDS sheets or best practices to handle any waste streams.

The primary issues relating to styrene are fire safety and emissions control. Our approach to this project is to operate under strict adherence to the existing regulations and take a proactive approach to HSE so our actions will be indicative of our commitment to employee safety and protection of the environment.

Emissions: Styrene is a regulated substance with specific limits on worker air quality. From a workplace quality perspective the limits in NL are a STEL (short term exposure limits) of 100 ppm and a TWA (Time Weighted Average) of 35 ppm. From an environmental perspective there are no provincial regulations enacted for minimal levels. If further information is requested or for the purposes of developing a baseline we would propose to test and analyze results based on Ontario standards. Due to the location of our shop we do not see any requirement to monitor at POi's (point of impingement) that are currently kilometers away from the facility.

Ventilation : External venting to the atmosphere will occur only when required. The process will involve opening vents until the air has circulated.

Air Quality: In the absence of a guideline for odor emissions in Newfoundland and Labrador, the Ontario Point of Impingement (POI) Limits could be used for comparison with ambient air concentrations. The Point of Impingement is defined by the Ontario Ministry of Environment as: "Any point on the ground or on a receptor, such as nearby buildings, located outside the company's property boundaries at which the highest concentration of a contaminant caused by the aggregate emission of that contaminant from a facility is expected to occur".

Due to the location of our facility we do not anticipate any issues with any POI locations. We are proposing this undertaking on a 6-acre site outside the Town of Long Harbour - Mount Arlington Heights. The closest POI would be several kilometers away.

A sample work instruction for a 6" bond is included in the attachments preceding this document. It outlines the steps required for a typical bond and shows the amounts of materials required. An inventory list and MSDS are included in the appendix.

Rubber Lining Services

We will relocate our rubber shop to the property in Long Harbour – Mount Arlington Heights. Our rubber services requires the use of an autoclave, blast booth and paint booth.

There are a couple of sources of pollutants possible from our rubber services. Although not harmful we will discharge steam into the atmosphere from our boiler and autoclave operations (it is important to note that the autoclave is not a process autoclave but instead a pressure vessel for curing rubber). Also there will be very small traces of vapor from the use of expoxies and paint. The amount of vapor resulting from our operations will be insignificant. A similar analysis of these vapours can be considered from the previous points listed about styrene. These products will be used in very small quantities.

Any paint pollutants will be captured by the filtration systems of our paint booth and discarded according to Government Regulations. We also have dust collection system designed for our blast booth. Information on our equipment is outlined in the appendices.

A sample work instruction for rubber lining is also included in the appendices. It outlines the steps required for a typical rubber lining job, the materials required and the curing process. An inventory list and MSDS are included in the appendix.

Anode Services

The anode is a critical part of the Vale Hydrometurigical process plant. Our contract requires warehousing, disassembly and assembly of the parts.

The biggest output of this operation is the disposal of the large amounts of packing materials and used or damaged cpvc parts. It is anticipated that the volume of packaging materials will become more manageable once the plant ramps up to steady state. All outputs will be removed from site in accordance with Provincial regulations. Every effort will be made to recycle as much

materials as possible.

Anode Services R&D

In addition to our existing anode services, ECS is investing in new technologies. The batch process that we are developing over the next couple of years will result in a further environmental assessment submission if the business case is proven. Once we determine the process and scope of stripping we will better understand the pollutants. During the R&D phase all pollutants will be collected and disposed of in accordance to Government Regulations.

The process that will be tested involves dipping titanium sheets into a tank containing a molten salt mixture at approximately 230 degrees C to remove a metal oxide coating and collecting the oxide residue in a sealed barrel for recovery. The titanium sheets are subsequently dipped in tanks containing sulphuric acid and cold water to remove the remaining trace coatings. Residue collected in these tanks will be filtered and stored for future testing and metal recovery.

All water and acid-containing streams will be pH adjusted to remove acids and dissolved metals and collected in an effluent storage tank for removal by a waste disposal contractor. The effluent is expected to meet environmental discharge criteria for all constituents with the potential exception of total dissolved solids – primarily sodium sulphate. The research and development operation of this system is expected to generate between 1 and 20 cubic metres of effluent water per week.

Anode Stripping Operation Chemicals

Molten Salt
For our Molten Salt we will be using a product sold by Kolene Corporation under the trade name ALKO-N^{TM}. It is a mixture of potassium hydroxide and potassium nitrate supplied in bead form, which will be melted inside a insulated tank and maintained at a temperature of approximately 230C. See the attached MSDS. We will have 6800 kg of salt in molten form inside the salt bath tank and an additional 1000 kg stored in bead form in 200 kg drums inside the building.
The level of Alko-N^{TM} is expected to be slowly depleted and topped up occasionally. The make-up rate is expected to be between 10 and 100 kg per month.

Sulphuric Acid
We will have approximately 2800 kg of 93% sulphuric acid on site of which approximately 2000 kg will be dissolved at approximately 25% by volume in an acid dip tank. The acid dip tank is contained inside an exterior secondary containment tank. The additional acid will be stored in its original shipping containers until needed.

A small amount of acid will be used to replace that which is consumed in the stripping process. The expected make-up rate is between 40 and 350 kg per month.

Hydrochloric Acid
We will have approximately 1000 kg of 35% Hydrochloric acid on site which will be diluted with water and stored inside an acid dip tank. The acid dip tank is contained inside an exterior

bunded area. The acid will be stored in its original shipping containers until needed.

Sodium Hydroxide
Sodium hydroxide, or caustic soda, will be used to neutralize process water prior to discharge. The expected monthly consumption of NaOH is between 20 and 200 kg per month. 50% solution caustic soda will be stored in either 250 kg drums or 1m3 totes.

IV. Occupations: ECS currently employees 44 people. This is a combination of labour, technicians, support staff and management. All our employees are direct hire with a combination of full time (29) and temporary (15) positions. ECS has been working with the Department of Advance Education, Skills and Labour to help develop training and skills development. Fiberglass and rubber lining are currently a craft and therefore there is very little training available. We are working on a training program that will provide better qualification for our technicians.

We have relationships established with the local colleges and university for hiring work term students. We work closely with the Office to Advance Women Apprentices to access female workers interested in the trades. 29% of our current workforce are female. We have used the Provincial Nominee program to bring in specific skills for rubber lining technicians and our current workforce is between 25-30 years old.

Our project will not see any additional employees being added to the ECS payroll. We will however require specialized trades in our construction related activities. ECS will contract out services for electricial and mechanica work as required.

LONG HARBOUR – MOUNT ARLINGTON HEIGHTS SERVICE CENTER
Eastern Composite Services
Construction Phase

Occupation	NOC 2011	Full/Part-time	Length of Employment	# of Personnel	Contracted Out, or Direct Hire
Construction Phase (Nov – Feb)					
Lead Foreman	0721	Full-time	3 months	1	Contract
Electrician	7241	Full-time	3 months	2	Contract
Pipefitter	7203/7252	Full-time	3 months	4	Contract
Carptener	7271	Full-time	3 months	1	Contract
Labourer	7611	Full-time	3 months	4	Contract

V. Project Related Documents: See attached appendix for project-related documents. ECS through Maher Group of Companies registered and was released from any signficiant environment assessment on two separate occasions relevant to our fiberglass operations.

Reg. 1602 – Titled: Fibreglass Reinforced Training Facility (Location: Town of Long Harbour-Mount Arlington Heights) Date released – November 2, 2011.

Reg. 1608 – Titled Argentia Fibreglass Reinforced Polymer Training Facility (Location: Building #772M, Argentia Industrial Park) Date released – November 22, 2011.

APPROVAL OF THE UNDERTAKING:

No special permits, licenses or approvals are required for this undertaking. We have an occupancy permit from the Town of Long Harbour - Mount Arlington Heights. Our building has been approved for Fire and Life Safety requirements and the design criteria of the septic system from Service NL. We are also registered with Service NL as a contractor for the installation of pressure pipe under ASME B31.3 boiler code.

SCHEDULE:

Construction has commenced for this project. Our lease expires in the building in Placentia at the end of the year and we need to have our services relocated. The move of our fiberglass and rubber facilities is pending the release of the project from the Enviromental Assessment. Our anode research project is pending the installation of our molten salt bath, approval of budget and consideration from the Department of Environment and Climate Change.

FUNDING:

The consolidation of our services to this location is being supported from loan facilities at the Provincial Government (Department of Business, Tourism, Culture and Rural Development) and the Federal Government (Atlantic Canada Opportunities Agency). The financing is in the range of $300,000 total from both Government agencies.

The Research and Development project is requesting funds from the Research and Development Corporation. The total amount of grant money for this project will be $250,000.

November 23, 2016
Date

Signature of Chief Executive Officer

APPENDIX A: PROCEDURES

Reinforced **P**lastic **S**ystems Inc. | Code B31.3 -BPS* | SP-2641-105
Manufacturing Specification | June 13, 2011

150mm (6")Ø P150(CRN)-319 Field Butt Joint

Revision: C

KIT MATERIAL:

Crevice Paste	FS-1787-M	0 lb	4 oz.
Brushcoat Resin	FS-1788-M	0 lb	4 oz.
Structural Resin	FS-1789-M	1 lb	8 oz.
MEKP Catalyst		0 lb	1 oz.

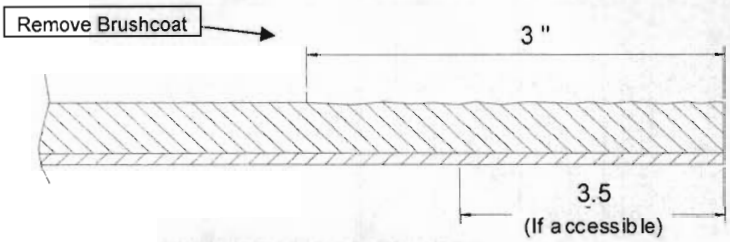
Total Reinforcement	0.47 lbs
1.5 oz. Mat	0.28 lbs
24 oz. Woven Roving ...	0.19 lbs
Nexus	0.01 lbs

* Qualified by PQR - SP-2451-006-B

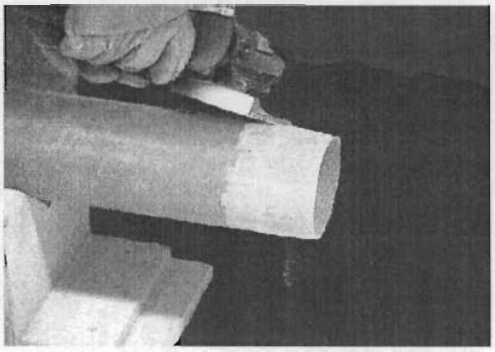
Total Width of 1.5 oz. Mat = 27"
Total Width of 24 oz. Woven = 7"

Preparation Step 1 - SANDING

Sand a 3" wide area on each side of the joint removing the glossy brushcoat and Liner as shown.



Refer to **Inside Joint Step** on page 3 before sanding this area



NOTE: Both joining surfaces must have the ***same OD***; therefore, sand off any high spots to achieve this. The joint lay-up must begin with-in ***4 hours*** after sanding, or re-sanding is required.

Note: *For general instructions on Butt & Wrap joining, refer to the* ***RPS Installation Manual***

Note: If the factory prepared ends are edged capped, Step 2 can be bypassed. Otherwise pipe and fitting must be edge capped per Step 2.

Preparation Step 2 - EDGE CAPPING - See above Note.

Using 0.25 lbs (99 ml) Structural Resin (FS-1789-M)

add 1 to 3 cc MEKP

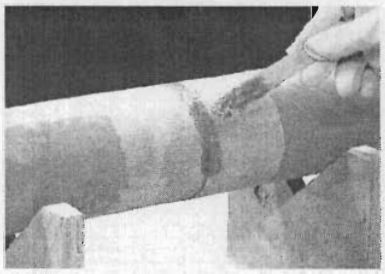
Mix resin thoroughly and wet-out the pipe edge. Using this resin wet-out and apply:

2 layers Nexus Veil 4 squares 8" x 8" (2 squares for each edgecap)

ALLOW to CURE, then, Using a Utility Knife Trim off Excess Veil

Preparation Step 3 - APPLY THE CREVICE PASTE

Position pipe/fittings together and hold in place.



Using 0.25 lbs (87 ml) Crevice Paste (FS-1787-M)

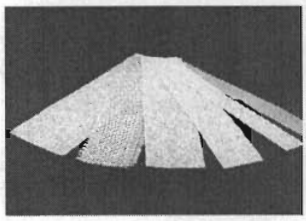
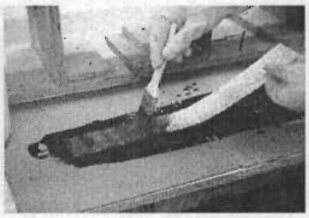
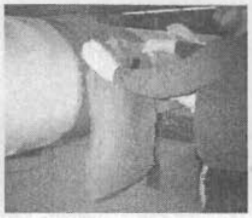
Add 1 to 3 cc MEKP catalyst

Apply the paste to the crevice area only!
DO NOT apply paste to the flat sanded surfaces. Allow to cure.

150mm (6")Ø P150(CRN)-319 Field Butt Joint

Revision: C

LAMINATING SEQUENCES


GET THE REINFORCEMENT - WET OUT THE REINFORCEMENT - APPLY THE REINFORCEMENT - ROLL OUT THE REINFORCEMENT

Sequence Step 1

Using 0.625 lbs (247 ml) Structural Resin (FS-1789-M)

Add 3 to 6 cc MEKP Catalyst and mix thoroughly

Using this resin mixture apply & allow to cure:

1	piece	Nexus Veil	2 "	x	23 "
1	piece	1.5 oz. Mat	2 "	x	23 "
1	piece	1.5 oz. Mat	3 "	x	23 "
1	piece	24 oz. Woven Roving	3 "	x	23 "
1	piece	1.5 oz. Mat	4 "	x	23 "

Sequence Step 2

Using 0.625 lbs (247 ml) Structural Resin (FS-1789-M)

Add 3 to 6 cc MEKP Catalyst and mix thoroughly

Using this resin mixture apply & allow to cure:

1	piece	1.5 oz. Mat	4 "	x	24 "
1	piece	24 oz. Woven Roving	4 "	x	24 "
1	piece	1.5 oz. Mat	5 "	x	24 "

Note: This FIELD specification complies with all applicable requirements of the ASME B31.3 Code.

***** Apply Exterior Brushcoat as detailed on page 3 *****

Exterior Brushcoat Step - COMPLETE Laminating Sequences 1 to 2 BEFORE COMPLETEING THIS STEP

This will be the **last step** in the procedure. This step is to be completed **only after all** reinforcement has been applied.
(Refer to laminating sequences 1 to 2)

Using 0.25 lbs (100 ml) Brushcoat Resin (FS-1788-M)

add 1 to 3 cc MEKP catalyst

Mix thoroughly and apply this brushcoat mixture to all lay-ups and exposed surfaces and allow to cure.

Inside Joint Step

The inside joint material is not included with this kit - Do not sand inside pipe

Inside Joint Brushcoat

APPENDIX B: INVENTORY

Eastern Composite Services

FRP

Item	Quantity	Units
Derakane 510 C		
1787 Paste	4	Gal
1788 Brushcoat	10	Gal
1789 Resin	15	Gal
Derakane 510 N		
0184 Paste	2	Gal
1737 Resin	20	Gal
1762 Black Liner Resin	2	Gal
1764 Brushcoat	2	Gal
1794 Black Paste	1	Gal
H1500 Adhesive	10	Kits
H1500C Adhesive	10	Kits
Air Dry	1	Gal
Acetone	15	Gal
470 Resin	35	Gal
8084 Resin	5	Gal
411 Resin	5	Gal
MEKP	12	Gal
CHP	7	Gal
DMA	6	lbs
6% Cobalt Naphthenate	6	lbs

RUBBER

Item	Quantity	Units
Interzinc 52 (Green)	12	Gal
Interzinc 52 (Converter)	7	Gal
Intergard 345 (Base Light)	5	Gal
Intergard 345 (Gray)	5	Gal
Intergard 345 (Hardener)	1	Gal
Intertherm 228 (Gray)	2.5	Gal
200 HS Hardener	2	Gal
International Thinner	5	Gal
T-10 International Thinner	2.5	Gal
LORD Chemlok 205	10	Gal
LORD Chemlok 286	15	Gal
LORD Chemlok 289	20	Gal
LORD Chemlok 290	25	Gal

APPENDIX C: MATERIAL SAFETY DATA SHEETS

ASHLAND

SAFETY DATA SHEET

Revision Date: 02/21/2013
Print Date: 5/18/2013
MSDS Number: R0402434
Version: 1.12

Derakane Momentum™ 510 C-350 EPOXY VINYL ESTER RESIN
™ Trademark, Ashland or its subsidiaries, registered in various countries
568180

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Ashland P.O. Box 2219 Columbus, OH 43216	Regulatory Information Number Telephone Emergency telephone number	1-800-325-3751 614-790-3333 1-800-ASHLAND (1-800-274-5263)
Product name	Derakane Momentum™ 510 C-350 EPOXY VINYL ESTER RESIN ™ Trademark, Ashland or its subsidiaries, registered in various countries	
Product code	568180	

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, amber

WARNING! FLAMMABLE LIQUID AND VAPOR. MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. MAY BE HARMFUL IF INHALED. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN, CAUSE IRRITATION AND BURNS.

Potential Health Effects

Exposure routes

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact

Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin contact

Can cause skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Ingestion

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.

Inhalation

Breathing of vapor or mist is possible. Breathing aerosol and/or mist is possible when material is sprayed. Aerosol and mist may present a greater risk of injury because more material may be present in the air than from vapor alone. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, respiratory tract, skin, lung (for example, asthma-like conditions), liver, male reproductive system, auditory system

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, metallic taste, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, loss of coordination, confusion, liver damage

Target Organs

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, mild, reversible kidney effects, effects on hearing, respiratory tract damage (nose, throat, and airways), testis damage, liver damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:, mild effects on color vision, effects on hearing, respiratory tract damage (nose, throat, and airways), central nervous system effects

Carcinogenicity

Styrene is listed as a possible human carcinogen by the International Agency for Research on Cancer (IARC) and as reasonably anticipated to be a human carcinogen by the National Toxicology Program (NTP).

Reproductive hazard

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Other information

Styrene readily reacts with low concentrations of halogens (for example, fluorine, chlorine, bromine, or iodine) to form a tear-producing substance. Excessive exposure may increase the blood and tissue levels of bromine.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	CAS-No. / Trade Secret No.	Concentration
STYRENE	100-42-5	>=30-<40%

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin

Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to physician

Hazards: This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 2 - Swallowing) when deciding whether to induce vomiting.

Treatment: No information available.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Dry chemical, Foam, Carbon dioxide (CO2), Water spray

Hazardous combustion products

carbon dioxide and carbon monoxide, phenols, toxic fumes, various hydrocarbons

Precautions for fire-fighting

Material is volatile and readily gives off vapors which may travel along the ground or be moved by ventilation and ignited by pilot lights, flames, sparks, heaters, smoking, electric motors, static discharge or other ignition sources at locations near the material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. During a fire, irritating or toxic decomposition products may be generated. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). DO NOT direct a solid stream of water or foam into hot, burning pools of liquid since this may cause frothing and increase fire intensity. Frothing can be violent and possibly endanger any firefighter standing too close to the burning liquid. Polymerization will take place under fire conditions. If polymerization occurs in a closed container, there is a possibility it will rupture violently. Cool storage container with water, if exposed to fire.

NFPA Flammable and Combustible Liquids Classification
Flammable Liquid Class IC

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection see section 8. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

Environmental precautions

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

Methods for cleaning up

Absorb liquid on vermiculite, floor absorbent or other absorbent material.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Do not use pressure to empty container. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association document NFPA 77. Warning.

Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Storage

Store in a cool, dry place at 75 degrees F or lower. Do not store near extreme heat, open flame, or sources of ignition. Maintain inhibitor and dissolved oxygen level. Do not blanket or purge with an inert gas to avoid depleting the oxygen concentration. Store out of direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

STYRENE		100-42-5
CAD AB OEL	time weighted average	20 ppm
CAD AB OEL	time weighted average	85 mg/m3
CAD AB OEL	Short term exposure limit	40 ppm
CAD AB OEL	Short term exposure limit	170 mg/m3
CAD BC OEL	time weighted average	50 ppm
CAD BC OEL	Short term exposure limit	75 ppm
OEL (QUE)	time weighted average	50 ppm
OEL (QUE)	time weighted average	213 mg/m3
OEL (QUE)	Short term exposure limit	100 ppm
OEL (QUE)	Short term exposure limit	426 mg/m3
CAD ON OEL	time weighted average	35 ppm
CAD ON OEL	Short term exposure limit	100 ppm
CAD MB OEL	time weighted average	20 ppm
CAD MB OEL	Short term exposure limit	40 ppm

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect

exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s). .

Eye protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin and body protection

Wear resistant gloves (consult your safety equipment supplier).
To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

Respiratory protection

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Colour	amber
Odour	pungent
Boiling point/boiling range	293 °F / 145 °C
Flash point	84.9 °F / 29.4 °C Seta closed cup
Lower explosion limit/Upper explosion limit	1.1 %(V) / 6.1 %(V) Calculated Explosive Limit
Vapour pressure	8.532 hPa @ 77 °F / 25 °C Calculated Vapor

	Pressure
Relative vapour density	(>)1 AIR=1
Density	1.15 g/cm3 @ 68.00 °F / 20.00 °C
	9.6 lb/gal @ 77.00 °F / 25.00 °C
Water solubility	insoluble

Auto-ignition temperature	914 °F / 490 °C

Viscosity, kinematic	> 20.5 mm2/s @ 40 °C

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid
Avoid heat, open flame, and prolonged storage at elevated temperatures.

Incompatible products
acids, aluminum chloride, halogens, iron chloride, metal salts, peroxides, strong alkalis, strong oxidizing agents, UV light.

Hazardous decomposition products
carbon dioxide and carbon monoxide, phenols, toxic fumes, various hydrocarbons

Hazardous reactions
Product can undergo hazardous polymerization., Avoid exposure to excessive heat, peroxides and polymerization catalysts.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity
Acute oral toxicity - : no data available

Product

Acute oral toxicity - Components

STYRENE	: LD 50: 2,650 mg/kg Species: Rat

Acute inhalation toxicity

Acute inhalation toxicity - Product	: no data available

Acute inhalation toxicity - Components

STYRENE	: LC 50: 2800 ppm Exposure time: 4 h Species: Rat

Acute dermal toxicity

Acute dermal toxicity - Product	: no data available

Acute toxicity (other routes of administration)

Acute toxicity (other routes of administration)	: no data available

12. ECOLOGICAL INFORMATION

Biodegradability

Biodegradability - Product	: no data available

Biodegradability - Components

STYRENE	: Remarks: Readily biodegradable

Bioaccumulation

Bioaccumulation - Product	: no data available

Ecotoxicity effects

Toxicity to fish

Toxicity to fish - Product	:	no data available

Toxicity to fish - Components

STYRENE	:	LC 50: 4.02 mg/l Exposure time: 96 h Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates

Toxicity to daphnia and other aquatic invertebrates - Product	:	no data available

Toxicity to daphnia and other aquatic invertebrates - Components

STYRENE	:	EC 50: 4.7 mg/l Exposure time: 48 h Species: Water flea (Daphnia magna)

Toxicity to algae

Toxicity to algae - Product	:	no data available

Toxicity to algae - Components

STYRENE	:	EC 50: > 4.9 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (green algae)

Toxicity to bacteria

Toxicity to bacteria - Product	:	no data available

Toxicity to bacteria - Components

STYRENE	:	EC 50: ca. 500 mg/l Exposure time: 0.5 h Species: activated sludge

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Do not discharge effluent containing this product into lakes, streams, ponds or estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit, and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA. Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.
U.S. DOT - ROAD					
UN 1866	Resin solution	3		III	
U.S. DOT - RAIL					
UN 1866	Resin solution	3		III	
U.S. DOT - INLAND WATERWAYS					
UN 1866	Resin solution	3		III	
TRANSPORT CANADA - ROAD					
UN 1866	RESIN SOLUTION	3		III	

TRANSPORT CANADA - RAIL

UN	1866	RESIN SOLUTION	3	III

TRANSPORT CANADA - INLAND WATERWAYS

UN	1866	RESIN SOLUTION	3	III

INTERNATIONAL MARITIME DANGEROUS GOODS

UN	1866	RESIN SOLUTION	3	III

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

UN	1866	Resin solution	3	III

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

UN	1866	Resin solution	3	III

MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES

UN	1866	RESINA, SOLUCIONES DE	3	III

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

WHMIS Classification

F Dangerously Reactive Material

B2 Flammable liquid
D2A Very Toxic Material Causing Other Toxic Effects
D2B Toxic Material Causing Other Toxic Effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Canadian National Pollutant Release Inventory (NPRI)
STYRENE 35.39 %

Notification status

US. Toxic Substances Control Act	y (positive listing)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	q (quantity restricted)
Australia. Industrial Chemical (Notification and Assessment) Act	y (positive listing)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	n (Negative listing)
Japan. Kashin-Hou Law List	y (positive listing)
Korea. Toxic Chemical Control Law (TCCL) List	y (positive listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	n (Negative listing)
China. Inventory of Existing Chemical Substances	y (positive listing)

	HMIS	NFPA
Health	2*	2
Flammability	3	3
Physical hazards	2	
Instability		2
Specific Hazard	--	--

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

Material Safety Data Sheet

Quadra

Chemlok® 290

WHMIS	Protective Clothing	TDG
		

1 . Product and company identification

Product name : Chemlok® 290

Supplier : QUADRA CHEMICALS LTD.
3901 F.X. Tessier
Vaudreuil-Dorion, Quebec
Canada J7V 5V5
Tel: 1-800-665-6553

Material uses : Industrial applications: Adhesive.

Code : H00290

Validation date : 3/11/2014.

Responsible name : Regulatory Affairs / Affaires réglementaires

In case of emergency : **TRANSPORTATION EMERGENCY - 24HRS/DAY - 7 DAYS/WEEK**
IN CANADA - CALL 1-800-567-7455

2 . Hazards identification

Physical state : Liquid.

Odor : Solvent.

Emergency overview : WARNING!

FLAMMABLE LIQUID AND VAPOR. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. POSSIBLE DEVELOPMENTAL HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE DEVELOPMENTAL EFFECTS, BASED ON ANIMAL DATA.

Flammable liquid. May be harmful if swallowed. Irritating to eyes and skin. Slightly irritating to the respiratory system. May cause sensitization by skin contact. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. May cause target organ damage, based on animal data. Contains material which may cause developmental abnormalities, based on animal data. Avoid exposure during pregnancy. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Slightly irritating to the respiratory system.

Ingestion : Harmful if swallowed.

Skin : Irritating to skin. May cause sensitization by skin contact.

Eyes : Irritating to eyes.

Potential chronic health effects

Chronic effects : May cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : Contains material which may cause developmental abnormalities, based on animal data.

2 . Hazards identification

Fertility effects : No known significant effects or critical hazards.

Target organs : May cause damage to the following organs: kidneys, liver, central nervous system (CNS).

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : Adverse symptoms may include the following:
pain or irritation
watering
redness

Medical conditions aggravated by over-exposure : Pre-existing skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
toluene	108-88-3	60 - 100
methyl methacrylate (monomer)	80-62-6	1 - 5

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

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Flash point : Closed cup: 6°C (42.8°F) [Setaflash.]

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
chlorine
hydrogen chloride
phosgene

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Spill or leak : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

7 . Handling and storage

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Product name	Exposure limits
toluene	**ACGIH TLV (United States).** TWA: 20 ppm 8 hour(s).
methyl methacrylate (monomer)	**ACGIH TLV (United States).** TWA: 50 ppm 8 hour(s). STEL: 100 ppm 15 minute(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Recommended: splash goggles

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Recommended: lab coat

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: 6°C (42.8°F) [Setaflash.]

Flammable limits : Lower: 1.2%
Upper: 8.2%

Color : Red.

Odor : Solvent.

Boiling/condensation point : 111°C (231.8°F)

Vapor density : >1 [Air = 1]

Volatility : 93.64% (v/v), 92.5% (w/w)

VOC : 813 (g/l).

Solubility : Insoluble in the following materials: cold water.

Density : 0.88 g/cm^3

10 . Stability and reactivity

Stability : The product is stable.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. Avoid exposure during pregnancy.

Materials to avoid : oxidizing materials
acids
alkalis
moisture

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

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
toluene	LD50 Dermal	Rat	12000 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-
	LC50 Inhalation Vapor	Rat	8000 ppm	4 hours
	LC50 Inhalation Vapor	Mouse	7524 ppm	4 hours
methyl methacrylate (monomer)	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rabbit	6550 mg/kg	-
	LC50 Inhalation Vapor	Rat	5300 ppm	4 hours

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
toluene	A4	3	-	-	-	-
methyl methacrylate (monomer)	A4	3	-	-	-	-

12 . Ecological information

Environmental effects : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Waste and empty packaging must be disposed of in accordance with federal, provincial, and municipal environmental control regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	1133	ADHESIVES	3	II		-

PG* : Packing group

15 . Regulatory information

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

Canada inventory : At least one ingredient is not listed in DSL but all such ingredients are listed in NDSL.

16 . Other information

Additional information : **This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.**

Other special considerations : No additional remark.

Regulatory Affairs Department : 1 800 665-6553

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

REMA TIP TOP

Product #'s: SC2000B, SC200B 1KG, SC2000BG, SC2000 DRUM

MSDS #: RTT-IND-002 **Rev. # 2** **Rev. Date: 1/15/2011**

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product Name: SC-2000 Cement (1/2 kg, 1 kg, 5 kg ,Drum)

Product Use: Adhesive agent.

Manufacturer: REMA TIP TOP/NO. AMERICA, 119 Rockland Avenue, Northvale, NJ 07647

24-Hour Emergency Phone Number: North America:800-424-9300 (CHEMTREC)
International: 703-527-3887 (CHEMTREC) Collect Calls Accepted

2. PRODUCT INGREDIENTS

CHEMICAL NAME:	CAS NUMBER:	% RANGE:	OSHA PEL:
Trichloroethylene	79-01-6	60-90	100 ppm TWA
Zinc oxide	1314-13-2	1-5	5 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust) 5 mg/m3 TWA (respirable fraction)

The balance of ingredients not rated as hazardous as defined in 29 CFR 1910.1200.

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication) and the Canadian Controlled Products Regulations.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

This product is a black liquid. This product may be irritating to the eyes, respiratory system and skin. This product may cause central nervous system depression and allergic reactions. Skin absorption is possible. Component of this product is known to be a possible carcinogen.

EYE: This product is irritating to the eyes. Vapors may also produce eye irritation.

SKIN: This product is irritating to the skin. Prolonged and/or repeated skin contact with this product can cause defatting of skin and dermatitis. Skin absorption is possible, causing systemic poisoning.

INGESTION: This product may be harmful if it is swallowed. Single dose toxicity is considered to be low. If aspirated (liquid enters the lung), this product may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: This product may be harmful by inhalation. Exposure to high concentrations of vapor or mist can cause central nervous system depression with symptoms of headache, dizziness, stupor, loss of consciousness or death. High concentrations can cause irregular heartbeat, cardiac arrest and death. Overexposure has been shown to cause adverse effects on the liver and nervous system.

4. FIRST AID

EYES: Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. If irritation persists get medical attention.

SKIN: For skin contact flush with large amounts of water while removing contaminated clothing. If irritation persists, get medical attention. Wash contaminated clothing before reuse.

INGESTION: Do not induce vomiting. Call a physician immediately.

INHALATION: Move person to non-contaminated air. If the affected person is not breathing, apply artificial respiration. Seek medical attention.

NOTE TO PHYSICIAN: Provide general supportive measures and treat symptomatically.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
Flash Point: >200°F (93.3°C)
Upper Flammable Limit (UFL): 44.8% @ 212°F (100°C)
10.5% @ 77°F (25°C)
Auto Ignition: 788°F (420°C)

Method Used: TOC, TCC, COC
Lower Flammable Limit (LFL): 8% @ 212°F (100°C)
8% @ 77°F (25°C)
Flammability Classification: Class IIIB liquid

HAZARDOUS COMBUSTION PRODUCTS: Hazardous combustion products may include and are not limited to hydrogen chloride. Hazardous combustion products may include trace amounts of phosgene and chlorine gases.

EXTINGUISHING MEDIA: Dry chemical, foam, carbon dioxide, water fog.

FIRE FIGHTING INSTRUCTIONS: This product poses a slight fire hazard.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

6. ACCIDENTAL RELEASE MEASURES

CONTAINMENT PROCEDURES: Stop the flow of material, if this is without risk. Contain the discharged material. Prevent contamination of soil, surface water or groundwater. Material is heavier than water and has limited water solubility. It will collect on the lowest surface.

CLEAN-UP PROCEDURES: Wear appropriate protective equipment and clothing during clean-up. Absorb spill with inert material. Shovel material into appropriate container for disposal.

EVACUATION PROCEDURES: Isolate area. Keep unnecessary personnel away.

SPECIAL PROCEDURES: Notify National Response Center (800-424-8802) of uncontained releases to the environment in excess of the Reportable Quantity (RQ). For all transportation accidents, call CHEMTREC at 800-424-9300.

7. HANDLING & STORAGE

HANDLING: Do not get this material in your eyes, on your skin, or on your clothing. Avoid breathing vapors or mists of this product. Wash thoroughly after handling. DO NOT eat, drink or smoke in product area.

STORAGE: Keep packaged in original, labeled containers until use. Store in a cool, dry place. Do not store in aluminum, zinc, aluminum alloys and plastic containers. Do not remove or deface label. Prevent water or moist air from entering containers. Do not reuse container without recycling or reconditioning in accordance with any Federal, Provincial, State or local laws. Do not use cutting or welding torches, open flames, or electric arcs on empty or full containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

PERSONAL PROTRECTIVE EQUIPMENT

EYE/FACE PROTECTION: Wear safety glasses with side shields. Contact lenses should not be exposed. Wear chemical goggles; face shield (if splashing is possible). If vapor exposure causes eye discomfort, use a full-face respirator.

SKIN PROTECTION: Use impervious gloves. Use of impervious apron and boots are recommended.

RESPIRATORY PROTECTION: If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

EXPOSURE GUIDELINE(s):
REMA TIP/TOP USA recommends that its customers minimize employee exposure. REMA therefore suggests that its customers consider adopting the lower of the current OSHA PEL or the ACGIH TLV's for the purpose of evaluating employee exposures. The TLV's recommended by the ACGIH have been updated on a continuing basis.

Component Exposure Limits

Trichloroethylene (79-01-6)

ACGIH:	50 ppm TWA
	100 ppm STEL
OSHA:	100 ppm TWA
	200 ppm Ceiling

Zinc oxide (1314-13-2)

ACGIH:	2 mg/m3 TWA (respirable fraction)
	10 mg/m3 STEL (respirable fraction)
OSHA:	5 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH:	5 mg/m3 TWA (dust and fume)
	10 mg/m3 STEL (fume)
	15 mg/m3 Ceiling (dust)

Component Exposure Limits - Canada

The following Provincial Exposure Limits apply for this product's components.

Trichloroethylene (79-01-6)

Alberta:	50 ppm TWA; 269 mg/m3 TWA
	100 ppm STEL; 537 mg/m3 STEL
British Columbia:	50 ppm TWA
	100 ppm STEL
Manitoba:	50 ppm TWA; 270 mg/m3 TWA
	200 ppm STEL; 1080 mg/m3 STEL
New Brunswick:	50 ppm TWA; 269 mg/m3 TWA
	100 ppm STEL; 537 mg/m3 STEL
NW Territories:	100 ppm TWA; 537 mg/m3 TWA
	150 ppm STEL; 806 mg/m3 STEL
Nova Scotia:	50 ppm TWA
	100 ppm STEL
Nunavut:	100 ppm TWA; 537 mg/m3 TWA
	150 ppm STEL; 806 mg/m3 STEL
Ontario:	50 ppm TWAEV
	100 ppm STEV
Quebec:	50 ppm TWAEV; 269 mg/m3 TWAEV
	200 ppm STEV; 1070 mg/m3 STEV
Saskatchewan:	269 mg/m3 TWA; 50 ppm TWA
	537 mg/m3 STEL; 100 ppm STEL
Yukon:	100 ppm TWA; 535 mg/m3 TWA
	150 ppm STEL; 800 mg/m3 STEL

Zinc oxide (1314-13-2)

Alberta:	10 mg/m3 TWA (dust); 5 mg/m3 TWA (fume)
	10 mg/m3 STEL (fume)
British Columbia:	2 mg/m3 TWA (respirable)
	10 mg/m3 STEL (respirable)
Manitoba:	5 mg/m3 TWA (fume); 10 mg/m3 TWA (total dust containing no asbestos and <1% crystalline silica)

	10 mg/m3 STEL (fume)
New Brunswick:	5 mg/m3 TWA (fume); 10 mg/m3 TWA (particulate matter containing no asbestos and < 1% crystalline silica, dust)
	10 mg/m3 STEL (fume)
NW Territories:	5 mg/m3 TWA (fume); 5 mg/m3 TWA (dust, respirable mass); 10 mg/m3 TWA (dust, total mass)
	10 mg/m3 STEL (fume)
Nova Scotia:	2 mg/m3 TWA (respirable fraction)
	10 mg/m3 STEL (respirable fraction)
Nunavut:	5 mg/m3 TWA (fume); 5 mg/m3 TWA (dust, respirable mass); 10 mg/m3 TWA (dust, total mass)
	10 mg/m3 STEL (fume)
Ontario:	2 mg/m3 TWAEV (respirable)
	10 mg/m3 STEV (respirable)
Quebec:	5 mg/m3 TWAEV (fume); 10 mg/m3 TWAEV (dust)
	10 mg/m3 STEV (fume)
Saskatchewan:	5 mg/m3 TWA (fume); 10 mg/m3 TWA (dust)
	10 mg/m3 STEL (fume); 20 mg/m3 STEL (dust)
Yukon:	5 mg/m3 TWA (fume); 30 mppcf TWA (dust); 10 mg/m3 TWA (dust)
	10 mg/m3 STEL (fume); 20 mg/m3 STEL (dust)

9. PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE: Black liquid

ODOR: Mildly sweet, ether-like **ODOR THRESHOLD:** ~60 ppm

BOILING POINT: 188°F (86.7°C)

SOLUBILITY IN WATER: 0.1 g/100g @ 77°F (25°C)

SPECIFIC GRAVITY: 1.45 @ 77°F (25°C)

VAPOR PRESSURE: 58 mm Hg @ 20°C (68°F)

% VOLATILE: 82%

10. STABILITY & REACTIVITY

INCOMPATIBILITY WITH OTHER MATERIALS: Materials to avoid are strong alkalies, oxidizers, barium, lithium, magnesium and titanium.

HAZARDOUS POLYMERIZATION: Will not occur.

DECOMPOSITION PRODUCTS: Upon decomposition, this product may produce hydrogen chloride and trace amounts of chlorine and phosgene (intense heat of fire).

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

This product may be irritating to the eyes, skin, and respiratory system. This product may cause sensitization in previously exposed individuals and result in contact dermatitis. This product may be absorbed through the skin. Acute inhalation may cause central nervous system depression with drowsiness, dizziness, headache, nausea, vomiting, unconsciousness and coma. Death may occur from respiratory arrest or ventricular fibrillation resulting in primary cardiac failure. Liver and kidney damage may also occur.

CHRONIC TOXICITY

Prolonged or repeated liquid contact can result in defatting and drying of the skin, which may result in skin irritation and dermatitis. Sensitization may occur. Repeated exposure to the eyes may cause conjunctivitis.

Chronic overexposure to the ingredient Trichloroethylene has caused toxic effects in the liver, lymphatic system (one species), kidney and cardiovascular system of experimental animals. Humans exposed to Trichloroethylene can become intolerant to ethyl alcohol, with small quantities causing inebriation and skin blotches. Reports have been published associating increased incidences of scieroderma (systemic scierosis) with exposure to Trichloroethylene. The finding of chronic toxic effects in lab animals may indicate toxicity to humans. Overexposure should be avoided; failure to do so could result in illness, injury or even death depending on the level and duration of exposure.

CARCINOGENICITY

This product contains component(s) that may be listed by ACGIH, IARC, NIOSH, NTP OR OSHA.

Component Carcinogenicity

Trichloroethylene (79-01-6)

ACGIH:	A5 - Not Suspected as a Human Carcinogen
NIOSH:	potential occupational carcinogen
NTP:	Reasonably Anticipated To Be A Carcinogen (Possible Select Carcinogen)
IARC:	Monograph 63, 1995; Supplement 7, 1987 (Group 2A (probably carcenogenic to humans))

12. ECOLOGICAL INFORMATION

Harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Component Analysis - Ecotoxicity - Aquatic Toxicity

Trichloroethylene (79-01-6)

Test & Species		**Conditions**
96 Hr LC50 Pimephales promelas	40.7 mg/L	flow-through
96 Hr LC50 Brachydanio rerio	60 mg/L	flow-through
96 Hr LC50 Lepomis macrochirus	45 mg/L	static
96 Hr EC50 Scenedesmus subspicatus	450 mg/L	
5 min EC50 Photobacterium phosphoreum	975 mg/L	

10 min EC50 Photobacterium phosphoreum	115 mg/L
15 min EC50 Photobacterium phosphoreum	190 mg/L
24 Hr EC50 Tetrahymena pyriformis	410 mg/L
24 Hr EC50 Bacillus subtilis	235 mg/L
24 Hr EC50 Nitrosomonas	0.81 mg/L
48 Hr EC50 Daphnia magna	2.2 mg/L

13. DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

UNUSED & UNCONTAMINATED PRODUCT:
Component Waste Numbers

Trichloroethylene (79-01-6)
RCRA: waste number U228
0.5 mg/L regulatory level

This product contains a component identified as hazardous under 40 CFR 261.24.

14. TRANSPORT INFORMATION

US DOT Information
Shipping Name: Trichloroethylene Mixture
UN/NA #: UN1710 **Hazard Class:** 6.1 **Packing Group:** III
Required Label(s): POISON
Additional Info.: Check RQ regulations for the product packaging.

PLACARD (WHEN REQUIRED): POISON, 6.

EXCEPTIONS: DOT Paragraphs 173.153 & 173.203.

ALTERNATE SHIPPING ARRANGEMENTS: Based on package or shipping container size, this product may be shipped as a, "Limited Quantity", or, renamed, "Consumer Commodity" and reclassified as, "ORM-D" Material.

TDG Information
Shipping Name: Trichloroethylene
UN/NA #: UN1710 **Hazard Class:** 6.1 **Packing Group:** III
Required Label(s): POISON

IMDG Information
Additional Info.:F-A, S-A

IATA Information
Additional Info.: 6.1

15. REGULATORY INFORMATION

US FEDERAL REGULATIONS

SARA 313 INFORMATION:

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 313 (40 CFR 372.65).

Trichloroethylene (79-01-6)

SARA 313: 0.1 % de minimis concentration

SARA HAZARD CATEGORY:

Acute Health: Yes **Chronic Health:** Yes **Fire:** No **Pressure:** No **Reactive:** No

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA):

Component Analysis

This material contains one or more of the following chemicals required to be identified under CERCLA (40 CFR 302.4).

Trichloroethylene (79-01-6)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

TOXIC SUBSTANCES CONTROL ACT (TSCA): All components are on the U.S. EPA TSCA Inventory List.

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Trichloroethylene	79-01-6	Yes	DSL	EINECS
Zinc oxide	1314-13-2	Yes	DSL	EINECS

STATE RIGHT-TO-KNOW:

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Trichloroethylene	79-01-6	Yes	Yes	Yes	Yes	Yes	Yes
Zinc oxide	1314-13-2	Yes	Yes	Yes	Yes	Yes	Yes

This product is not a consumer product. This product may not be legally authorized for consumer use or sale in a state that has adopted the OTC Model Rule, or in California pursuant to the Consumer Products Regulation of the California Air Resources Board, or in states with similar laws. Please check federal, state and local air control laws for guidance.

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

CANADIAN REGULATIONS

This product is regulated under the Canadian Controlled Products Regulations.

WHMIS INFORMATION:

WHMIS Classification:
D1A- Poisonous
D2A- Chronic Toxic Effects
D2B- Irritating to eyes and skin

Component Analysis - WHMIS IDL
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Trichloroethylene	79-01-6	1 %
Zinc oxide	1314-13-2	1 %

EUROPE:

Component Analysis

Component (CAS#)	EC #
Trichloroethylene (79-01-6)	201-167-4
Zinc oxide (1314-13-2)	215-222-5

16. OTHER INFORMATION

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:
NFPA Ratings: Health: 2 **Fire:** 1 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

MEDICAL EMERGENCIES:

Call CHEMTREC 24 hours a Day for emergency information 800-424-9300

FOR ANY OTHER INFORMATION:

REMA TIP TOP/NO. AMERICA
119 Rockland Ave.
NORTHVALE, NJ 07647
201-768-8100

NOTICE: REMA TIP/TOP USA believes that the information contained on this material safety data sheet is accurate. The suggested procedures are based on experience as of the date of publication. They are not necessarily all-inclusive nor fully adequate in every circumstance. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulations, rules or insurance requirements.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

Material Safety Data Sheet

EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)
(CAN) CANUTEC : 1(613) 996-6666 (24hrs)
(USA) Anachemia : 1(518) 297-4444
(CAN) Anachemia : 1(514) 489-5711

WHMIS	Protective Clothing	TDG Road/Rail
WHMIS CLASS: D-1B D-2A D-2B		TDG CLASS: 6.1 PIN: UN1710 PG: III
		

Section I. Product Identification and Uses

Product name	**TRICHLOROETHYLENE**
Chemical formula	CHCl:CCl2
Synonyms	Trichloroethene, Acetylene trichloride, Ethylene trichloride, AC-9360, AC-9360T, GD-9360, AC-9361, 93886, 93898, 93881, 93875
Supplier	Anachemia Canada. 255 Norman. Lachine (Montreal), Que H8R 1A3
Material uses	For laboratory use only.

CI#	Not available.
CAS#	79-01-6
Code	AC-9360
Formula weight	131.39
Supersedes	

Section II. Ingredients

Name	CAS #	%	TLV
1) TRICHLOROETHYLENE	79-01-6	90-100	Exposure limits: ACGIH TWA 10 ppm; STEL 25 ppm
2) May contain:			
3) 1,2-BUTYLENE OXIDE	106-88-7	0.5	Not established by ACGIH

Toxicity values of the hazardous ingredients

TRICHLOROETHYLENE:
ORAL (LD50): Acute: 2402 mg/kg (Mouse). 4920 mg/kg (Rat).
ORAL (LDLo): Acute: 7000 mg/kg (Human).
DERMAL (LD50): Acute: >20000 mg/kg (Rabbit).
VAPOR (LC50): Acute: 8450 ppm (Mouse) (4 hour(s)).

Section III. Physical Data

Physical state and appearance / Odor	Colorless liquid with chloroform-like odor.
pH (1% soln/water)	Not available.
Odor threshold	20 ppm
Percent volatile	100% (V/V)
Freezing point	-87°C to -73°C
Boiling point	86 to 88°C
Specific gravity	1.46 (Water = 1)
Vapor density	4.54 (Air = 1)
Vapor pressure	100 mm Hg @ 32°C
Water/oil dist. coeff.	Log P = 2.29
Evaporation rate	3.8 (n-Butyl acetate = 1).
Solubility	0.1g/100 ml H2O @ 25°C.

Section IV. Fire and Explosion Data

Flash point	Not available.
Flammable limits	LOWER: 7.8% UPPER: 10.5% @ 25°C, 90% @ 100°C
Auto-ignition temperature	410°C
Fire degradation products	Oxides of carbon, hydrogen chloride, hexachlorobutene, dichloracetyl chloride and phosgene. Dichloroethylne.
Fire extinguishing procedures	Use DRY chemical, carbon dioxide, alcohol-resistant foam or water spray. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode. Cool containing vessels with flooding quantities of water until well after fire is out.
Fire and Explosion Hazards	Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame or high intensity source of heat. Vapor forms explosive mixture with air. Container explosion may occur under fire conditions or when heated. The sensitivity to static discharge is not available. The sensitivity to impact is not available. Emits toxic fumes under fire conditions.

Section V. Toxicological Properties

Routes of entry	Inhalation and ingestion. Eye contact. Skin contact. Skin absorption.
Effects of Acute Exposure	Harmful by ingestion, inhalation or skin absorption. Irritant. May cause neurasthenia. Hepatotoxic. Exposure to and/or consumption of alcohol may increase toxic effects. Target organs: eyes, heart, central nervous system, liver, kidneys, skin, respiratory system, lungs, peripheral nervous system. 1000 ppm (TRICHLOROETHYLENE) is immediately dangerous to life or health.
Eye	Severe irritation, corneal burns, conjunctivitis and possible corneal damage. Vapors may cause the same effects, noticeable at 5 ppm in human.
Skin	Can cause defatting, drying and cracking of the skin. Prolonged and repeated contact may lead to dermatitis. Burns can occur if not promptly removed. Liquid can be absorbed in toxic amounts through intact skin. See inhalation. IRRITATION: SKIN-RABBIT 2 mg/24H SEVERE.
Inhalation	Vapors are irritating to the nose, throat and respiratory tract. May cause central nervous system depression (headache, nausea, vomiting, drowsiness, weakness, dyspnea, abdominal pain, incoordination, etc..), convulsions, visual disturbances, cardiac arrythmia, systemic poisoning, kidney damage, and peripheral nervous system effects. Overexposure can lead to coma and death from cardiac or respiratory failure. May sensitize myocardium and cause cardiac arrhythmia. May cause alcohol intolerance often manifested by temporary reddening of the skin called "degreaser's flush".
Ingestion	May cause irritation and burning of the mouth, throat, respiratory tract, and esophagus. Can cause convulsions, central nervous system depression, diarrhea, cardiac arrythmia, blindness, liver and kidney damage and death possible. Aspiration of material into lungs can cause chemical pneumonitis which can be fatal. Estimated lethal dose is 3-5 mL/Kg.

Section V. Toxicological Properties

Effects of Chronic Overexposure	Dermatitis, central nervous system depression, peripheral nervous system effects, irritability, insomnia, tremors, vertigo, anemia, bradycardia, neurasthenia. Damage to liver, kidney, nervous system and other organs possible. Animal: mutagen, suspect carcinogen, liver, kidney, skin, lung, spleen, nerves, and brain damage. In vitro studies in mammal cells have shown mutagenic action. Passes through the placental barrier in human. Detected in maternal milk in human. May cause sensitization by skin contact. Possible carcinogen. Teratogenic effects: Not available. To the best of our knowledge, the chemical, physical, and toxicity of this substance has not been fully investigated.

Section VI. First Aid Measures

Eye contact	IMMEDIATELY flush eyes with copious quantities of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. If irritation persists, repeat flushing. Seek immediate medical attention.
Skin contact	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If irritation persists, repeat flushing. Seek immediate medical attention. Wash contaminated clothing before reusing. Discard contaminated leather articles such as shoes and belt.
Inhalation	Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Seek immediate medical attention. Do not give vasopressor drugs (epinephrine, adrenaline, ephedrine, etc...) as there may be danger of cardiac arrythmia.
Ingestion	DO NOT induce vomiting. If conscious, wash out mouth with water. Have conscious person drink several glasses of water to dilute. Seek immediate medical attention. Never give anything by mouth to an unconscious or convulsing person. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Vomiting should only be induced under the direction of a physician or a poison control centre. Emergency Medical Care: This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Do not give vasopressor drugs (epinephrine, adrenaline, ephedrine, etc...) as there may be danger of cardiac arrythmia.

Section VII. Reactivity Data

Stability	Stable. Conditions to avoid: High temperatures, sparks, open flames and all other sources of ignition, contamination, direct sunlight or ultraviolet sources.
Hazardous decomp. products	Hydrogen chloride, phosgene, carbon monoxide, and other toxic or irritating chlorine-containing gases. Possible reaction with aluminium to form acidic gases which can become violent.
Incompatibility	Alkalies, metals (barium, titanium, zinc, calcium, aluminum, magnesium, sodium, potassium, lithium, etc..), bases, oxidizing agents, epoxides, nitrogen tetroxide, aluminum trichloride, reducing agents, potassium hydroxide, sodium hydroxide, potassium nitrate, heat, perchloric acid, oxygen (liquid and gas), acids, 1,1,1-trichloroethane, amines.
Reaction Products	Trichloroethylene will slowly decompose on exposure to light in the presence of humidity. Trichloroethylene may react violently with metals (e.x., aluminum) to form heat and acidic gases. May decompose with strong alkalies to give spontaneously flammable and highly toxic chrloroacetylenes. Contamination of solvent with small amounts of 1,1,1-trichloroethane can affect stabilizers and shorten solvent life. Hazardous polymerization will not occur.

Section VIII. Preventive Measures

Protective Clothing in case of spill and leak

Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Full suit.

Spill and leak

Evacuate and ventilate the area. Turn off heating and/or air conditioning systems to prevent vapors from contaminating entire building. Eliminate all sources of ignition. Stop leak if without risk. Dyke the area with sand or a natural barrier. Absorb on sand or vermiculite and place in a closed container for disposal. Ventilate area and wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch spilled material. Runoff to sewer may create fire or explosion hazard. Stay upwind: Keep out of low areas.

Waste disposal

Dispose of waste material at an approved (hazardous) waste treatment/ disposal facility in accordance with applicable local, provincial and federal regulations. This material and its container must be disposed of in a safe way. Harmful to aquatic life at low concentrations. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

Storage and Handling

Do not use handling equipment or containers composed of magnesium, aluminum, zinc or their alloys and plastic. Do not use pressure to dispense. Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials. Do not add any other material to the container. Do not wash down the drain. Do not breathe gas/fumes/vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. Keep away from direct sunlight or strong incandescent light. Keep container tightly closed and dry. Manipulate under an adequate fume hood. Take precautionary measures against electrostatic discharges. Ground the container while dispensing. Ground all equipment containing material. Use explosion proof equipment. Use non-sparking tools. Watch for accumulation in low confined areas. Empty containers may contain a hazardous residue. Keep away from humidity as this will promote corrosion. This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling. In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible.). Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Section IX. Protective Measures

Protective clothing

Face shield and splash goggles. Impervious vitron gloves, apron, coveralls, and/or other resistant protective clothing. Sufficient to protect skin. Prior to use, user should confirm impermeability. A OSHA/MSHA jointly approved respirator is advised in the absence of proper environmental controls. If more than TLV, do not breathe vapor. An air-supplied respirator if concentrations are higher or unkown. Have available and use as appropriate: face shields, rubber suits, aprons, and boots. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.

Engineering controls

Use in a chemical fume hood to keep airborne levels below recommended exposure limits. Do not use in unventilated spaces. Vapors are heavier than air and may travel along the ground or pool in low areas. Because vapor is heavy, ventilation must be provided at floor level as well as at higher levels. Lethal concentrations may exist in areas with poor ventilation.

Section X. Other Information

Special Precautions or comments

Toxic! Severe irritant! Mutagen! Possible carcinogen! Possible risks of irreversible effects. Readily absorbed through skin. Do not breathe vapor. Avoid all contact with the product. Avoid prolonged or repeated exposure. Use in a chemical fume hood. Keep away from heat, sparks and flame. Take precautionary measures against static discharges. Use non-sparking tools. Handle and open container with care. Container should be opened only by a technically qualified person.
Synergistic materials: Carbon tetrachloride, disulfiram, warfarin, acetone, alcohols (isopropanol, ethanol, etc...), phenobarital, 3-methyl cholanthrene. Do not give vasopressor drugs (epinephrine, adrenaline, ephedrine, etc...) as there may be danger of cardiac arrythmia. Exposure to and/or consumption of alcohol may increase toxic effects. ANIMAL: Cross sensitization with: Lithium carbonate.
RTECS NO: KX4550000 (Trichloroethylene).

NFPA

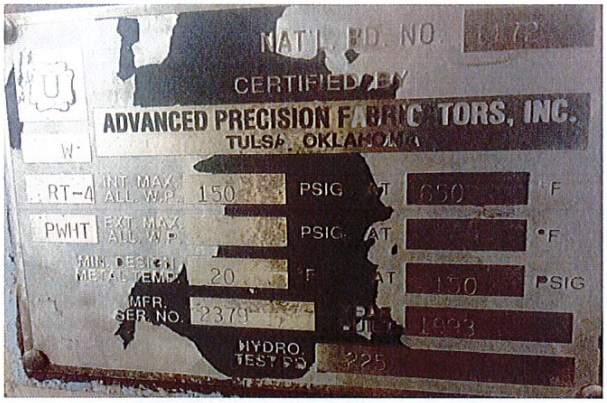
Prepared by MSDS Department/Département de F.S..

Validated 03-Jun-2013

APPENDIX D: EQUIPMENT

AUTOCLAVE

Advanced Precision Fabricators 72" Diameter Horizontal Autoclave, 25'-8 1/16" Length, Serial No. 2378, 150 PSIG at 650 °F,



3/8" Steel Construction vessel built in accordance with ASME Sec. VII Div. 1 1992 Ed., Pressure Tested at 250 PSIG, Dry Weight 18637 lbs, 61788 lbs hydro, all welding as per Code UW-31(c), 3" steam discharge with steel gate valve to atmosphere, 3" iron pipe, as well as 3" Spring-loaded Safety Valve for emergency discharge, 3" iron pipe to atmosphere.

Eastern
Composite Services

FRP SHOP – DUST COLLECTION UNITS

DATA SHEET

Document Number *<210-DS-001>*

Version *<1.0>*

<22/11/2016>

TABLE OF CONTENTS

1 INTRODUCTION

1.1 PURPOSE

This Document provides basic general information on the Portable Dust Collection and Downdraft Table Units for the FRP Shop at Eastern Composite Services' Long Harbour Service Centre in Long Harbour, NL, Canada.

2 GENERAL OVERVIEW

There are one each of the Downdraft Table and Portable Units for our work in this area. The Data is included below.

3 EQUIPMENT INFO

3.1 DOWNDRAFT TABLE

Donaldson Torit

Descripition: Self-contained dust collector with cartridge style filters. Designed as a workstation for grinding, polishing, hand sanding, and dry buffing applications, the downdraft bench with 3,000 CFM four-filter unit. Direct drive airfoil fans, 200 fpm minimum face velocity across the slotted-steel work surface, 75-lb/ft^2 holding capacity.

Model No.: DB-3000

Serial No.: 3663041

Electrical: 460V/60Hz/3Φ

Motor: 5 HP

Filter: P191508

3.2 PORTABLE DUST COLLECTOR

Donaldson Torit

Descripition: Ex-Arm Extraction Arm EZ-Trunk for carrying airbourne contamination away from the operator's breathing zone, operating in conjunction with portable collector unit.

Model No.: EZ TRUNK

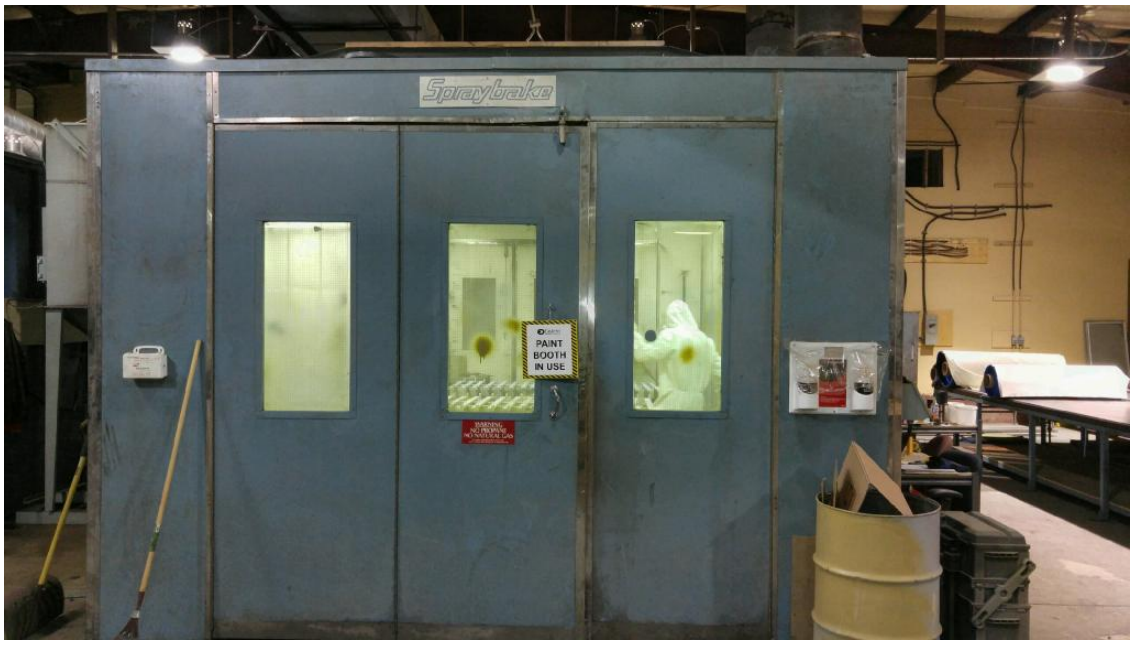
Serial No.: 3672931-01-U01-01

Electrical: 115V/60Hz/1 Φ

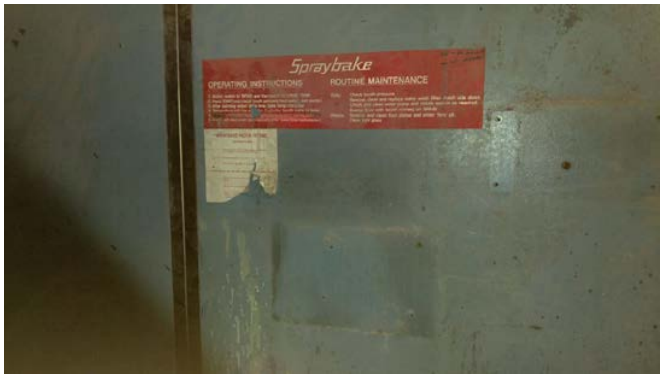
Motor: 1.5 HP

Filter Part No.: P191115-016-340

PAINT BOOTH



Spraybake Paint Booth, 14’2” x 24’2” x 10’, Model No. SB10DDSMG, 220 Line V, 110 Control V, 3 phase, 60 Hz, 15 HP, max rating 650000 BTUH



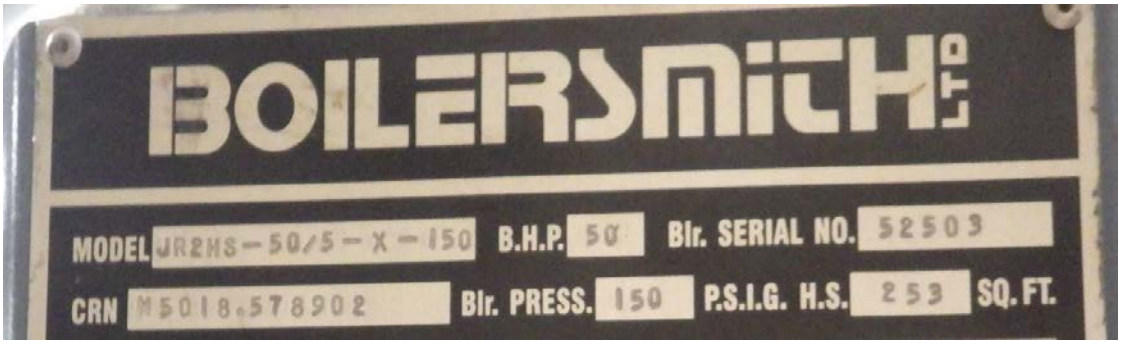
BLAST BOOTH

Sand Blasting Booth 12’ 4” x 30’ x 10’ , ¼” steel tubing and plate construction, pneumatic recovery, Blast-It-All dust collector, Model No. SPR 9600, Serial No. 140521112,

Abratech D-20 Bag Model Baghouse/Dust collector, 900 CFM, automatic shaking system

BOILERSMITH BOILER

Boilersmith JR2HS-50-X-150 50 HP High Pressure Steam Boiler, CRN# 5018.578902, 13’ 6” length 5’ 7” diameter.



FUEL TANK

Horizontal Above Ground Tank – Double Wall Fuel Tank (ULC S601), 4565 L, 144” length x 50” diameter, Serial No. D-917917095, 1768 kg dry weight, Steel to ASTM A-569, Max Operating Pressure 7 kPa, Max operating vacuum 300 kPa, required venting capacity 76 m^3/minFull-Web Steel saddles, c/w vacuum gauge, lockable spill containment chamber, manufactured 2013

GENERAL

Combustible materials such as buffing lint, paper, wood, fiberglass and metal dust, weld fume, or flammable coolants or solvents represent potential fire and/or explosive hazards. Special care must be taken when selecting, and operating all dust, fume, or mist collection equipment when such combustible material may be present in order to protect workers and property from serious injury or damage due to a fire and /or explosion.

Donaldson Down Draft Work Bench

Please use the Manufacturer product manual for all product specific safety and maintenance requirements.

Donaldson Ex-Arm Portable Vacuum System

Please use the Manufacturer product manual for all product specific safety and maintenance requirements.

APPENDIX E: DRAWINGS

Long Harbour
Mount Arlington Heights

November 22, 2016

Mr. Andrew Colford
Managing Director
Eastern Composite Services
702 Water Street
St. John's, NL
A1E 1C1

Re: Commercial Development at Civic Address 542 Long Harbour Road

Dear Mr. Colford:

Thank you for your letter of October 17, 2016, and presentation to Council on November 17, 2016, outlining your intended use of civic address 542 Long Harbour Road.

It is your intention to move your fiberglass, rubber lining and anode R&D facility to this location.

At the regular meeting of Council held November 17, 2016, a motion carried to approve the development in principle subject to the approvals of all other government agencies having jurisdiction.

As the proposed development requires an environmental assessment, Council can only offer support for the development subject to the results of the environmental assessment.

The use class for this area is commercial and does not conflict with the proposed development.

Trusting this is satisfactory.

Sincerely,

Juanita Gosse
Town Manager

PO Box 40 • Long Harbour-Mount Arlington Heights • NL A0B 2J0
Tel: 709 228-2920 • Fax: 709 228-2900 • towncouncil@longharbour.net • www.longharbour.net

Newfoundland Labrador

Government of Newfoundland and Labrador
Service NL

December 18, 2014

CERTIFICATE OF APPROVAL

Placentia Bay Holdings Ltd.
702 Water Street
St. John's NL
A1E 1C1

RE: Route 202, Long Harbour Mt Arl. Heights
GSC File number: HS-2014 112464 00

Dear Holdings Ltd.:

Pursuant to the Sanitation Regulations and based on a review of the site data and design provided by Approved Designer William R.V. Earle, Registration# AD-2014 112542, approval is given to **Placentia Bay Holdings Ltd.** for the construction and installation of a sewage system/water supply to service a warehouse at **Route 202 in the Town of Long Harbour Mt Arl. Heights.** The sewage system/water supply must be installed precisely as indicated on the Approved Designer's drawings and must not be changed without prior approval from an Environmental Health Officer. **A deviation from the terms and conditions of a Certificate of Approval shall make it null and void.**

It shall be noted that the sewage system/water supply shall not be backfilled before being inspected and without having first obtained a final approval certificate. This can be arranged by calling the number listed below and giving advance notice of **five working days**. Please note, it is the responsibility of an applicant to ensure that a Final Approval Certificate is obtained from the officer in respect of the installed sewage system/water supply. Where a sewage system/water supply has been covered without a final approval certificate, an Environmental Health Officer may, at the expense of the applicant, require it to be uncovered for inspection.

This Certificate of Approval is valid for 24 months from the date of issue. An extension of a further 12 months may be granted. This Certificate of Approval does not release the applicant from the obligation to obtain appropriate approvals from other concerned provincial, federal and municipal agencies and is conditional upon the applicant having clear title to the land.

It is your responsibility to retain a copy of this approval and its associated septic system design plans for your files.

Yours truly,

Jason Langdon, C.P.H.I.(C)
Environmental Health Officer

C Town of Long Harbour Mt Arl. Heights
William R.V. Earle, Approved Designer

BUILDINGS ACCESSIBILITY

After a review of the Buildings Accessibility applications and plans, it has been determined that at the present time, this project is exempt from the provisions of the Buildings Accessibility Act and Regulations

Exemption Number: **EA 6646**

The design of the proposed project is therefore not required to comply with the technical requirements of the Buildings Accessibility Regulations. Any future reconstruction at this location must be similarly submitted to this department for a re-assessment of whether the conditions for exemption remain valid. Please quote the above Exemption Number on any future applications for this property.

We trust that you will note and adhere to the requirements as stated above for both Fire and Life Safety and Buildings Accessibility.

Yours truly,

William Pippy, C. Tech.
Design Approval Technician II
Service NL, Mount Pearl, NL
Phone: (709)729-3144

WP/wp

cc

- Office of the Fire Commissioner, Deer Lake, NL
- Ms. Sharon Williams, Manager, Service NL, Mount Pearl
- Manager of Inspection Services, Service NL, Mount Pearl
- Town of Long Harbour, NL

Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

PERMIT TO CONSTRUCT A NON-DOMESTIC WELL

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 58

Date: **JANUARY 18, 2016**

File No: **NDOM16-001**
Permit No: **GW8456-2016**

Permit Holder: **Eastern Composite Services**
702 Water Street
St. John's, NL
A1E 1C1

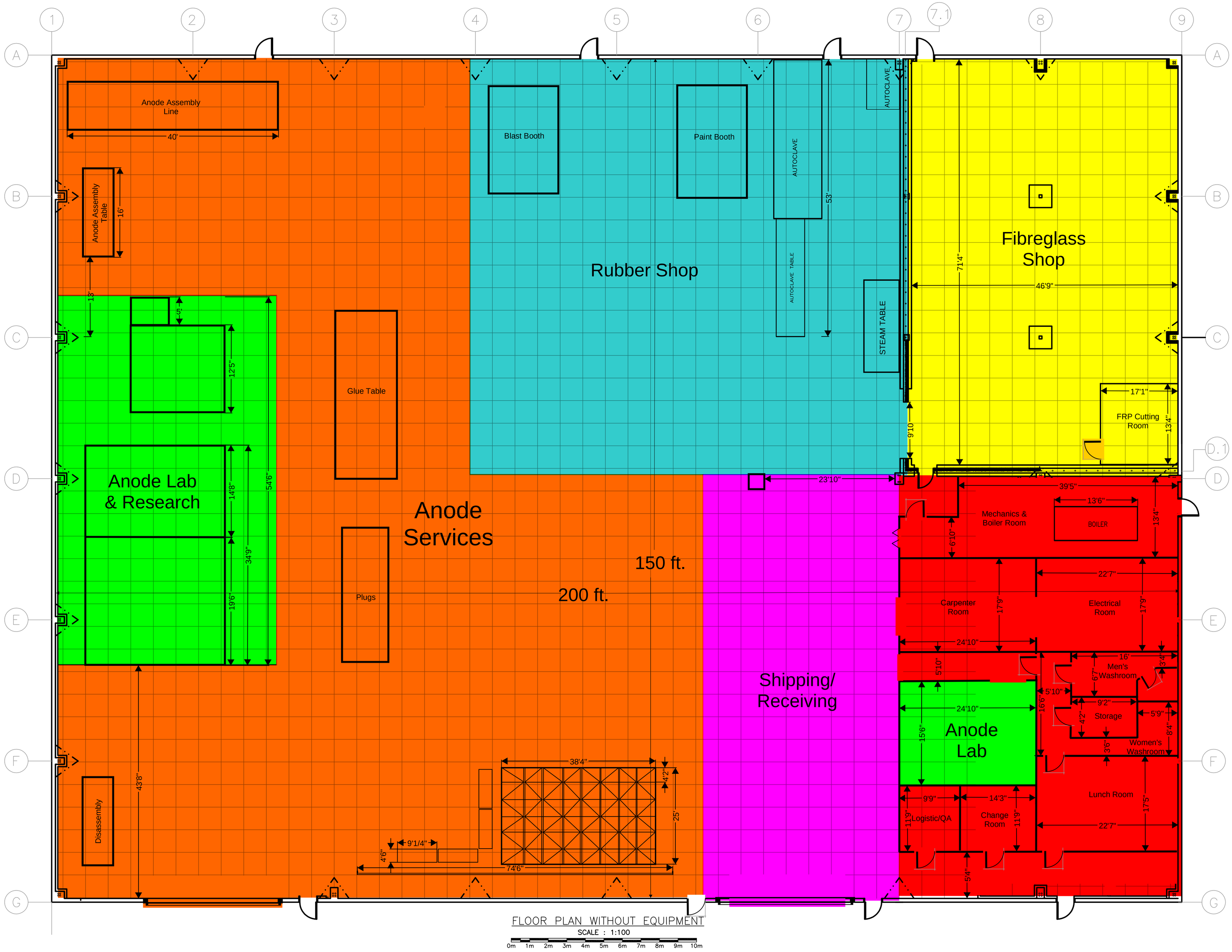
Attention: **Andrew Colford**

Re: **Eastern Composite Services - Well for bathrooms, Long Harbour**

Permission is hereby given for : **Well for bathroom facilities.**

- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- The Permit Holder must obtain the approval of the Crown Lands Administration Division if the project is being carried out on Crown Land.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this Permit must be obtained from the Department of Environment and Conservation under Section 49 of the *Water Resources Act*.
- Failure to comply with the terms and conditions will render this Permit null and void, place the Permit Holder and their agent(s) in violation of the *Water Resources Act* and make the Permit Holder responsible for taking any remedial measures as may be prescribed by this Department.

MINISTER



FLOOR PLAN WITHOUT EQUIPMENT

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

MECHANICAL & ELECTRICAL CONSULTANT

CROSBIE ENGINEERING LTD.

CONSULTING ENGINEERS

21 Mews Place, 2nd Floor
P.O. Box 13295, Station "A"
St. John's, NL A1B 4A5

Tel: (709) 754-1911
Fax: (709) 754-1960
admin@crosbieeng.com

GENERAL NOTES:

1. DO NOT SCALE FROM THIS DRAWING.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE BEFORE PROCEEDING WITH THIS WORK.
3. ALL WORK TO BE IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF: THE NATIONAL BUILDING CODE OF CANADA, LATEST EDITION; CANADIAN ELECTRICAL CODE, CURRENT EDITION; ANY OTHER AUTHORITIES HAVING JURISDICTION.
4. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS ISSUED FOR CONSTRUCTION AND STAMPED AND SIGNED BY THE PROJECT ENGINEER.

PRELIMINARY
NOT FOR CONSTRUCTION

No.	DESCRIPTION	DATE	BY:
A	ISSUED FOR REVIEW	09/06/16	M.K.

REVISIONS

STAMP

REGISTERED PROFESSIONAL ENGINEER — DAVID A. SMITH — SIGNATURE — PROVINCE OF NEWFOUNDLAND

PERMIT

PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
Class "A"
This Permit Allows
CROSBIE ENGINEERING LIMITED
To practice Professional Engineering in Newfoundland and Labrador
Permit No. as issued by PEG-NL 00123
which is valid for the year 2016.

DRAWN BY:	M.KEATS	DATE:	APR. 2016
CHECKED BY:	N.CLEARY	DATE:	APR. 2016
APPROVED BY:	N.CLEARY	DATE:	APR. 2016
SCALE	AS NOTED		

A/B/C
A DETAIL NO.
B DRAWING NO. WHERE DETAIL REQUIRED
C DRAWING NO. WHERE DETAILED

PROJECT

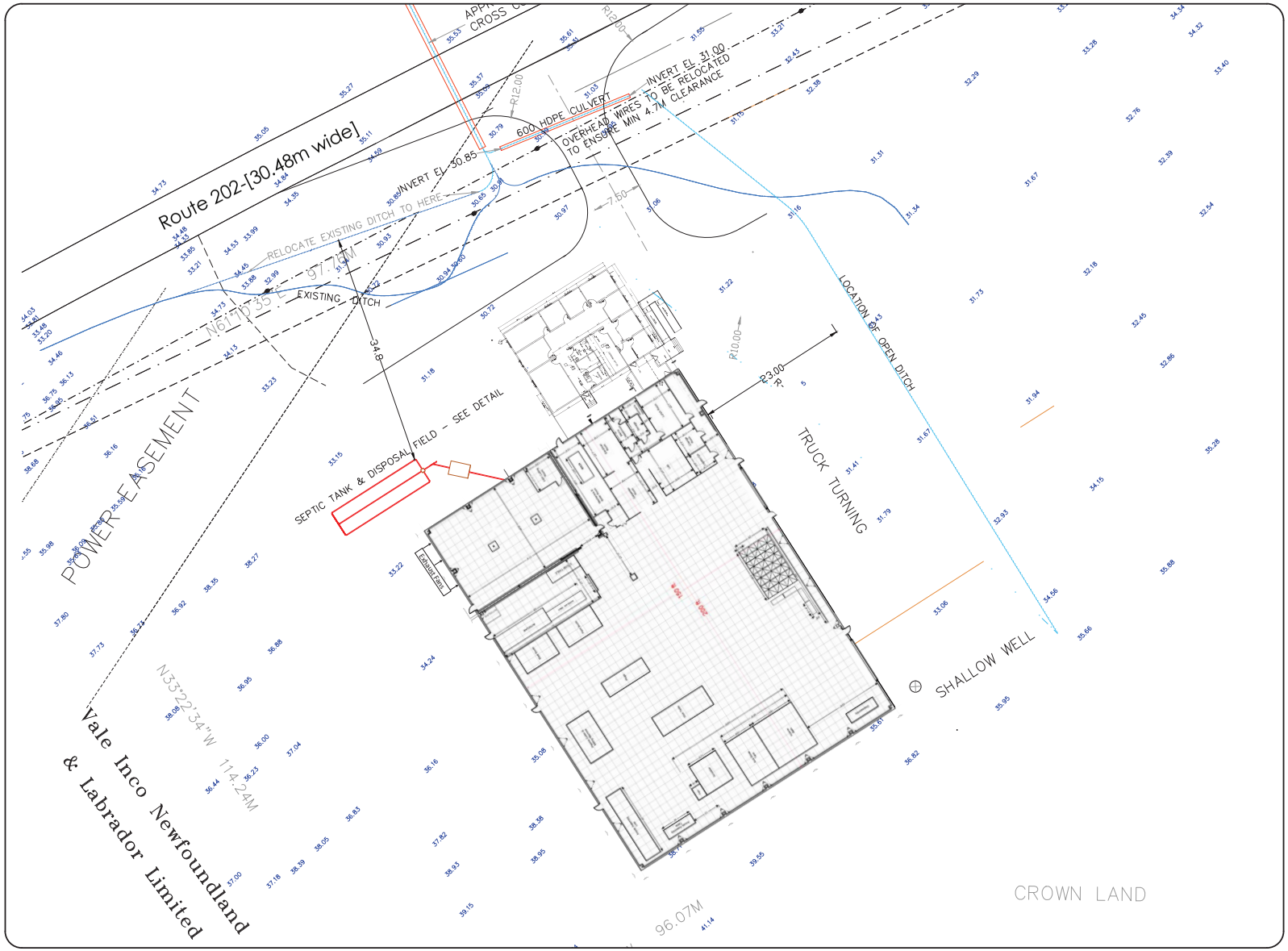
LONG HARBOUR WAREHOUSE

LONG HARBOUR NL

DRAWING TITLE

FLOOR PLAN WITHOUT EQUIPMENT

CEL PROJECT No.	DRAWING No.
16-2079	M-1



No.	Description	Date
	REVISIONS	

Reference North

Drawn by: WE Developed by: WE

Checked by Date

Approved by Date

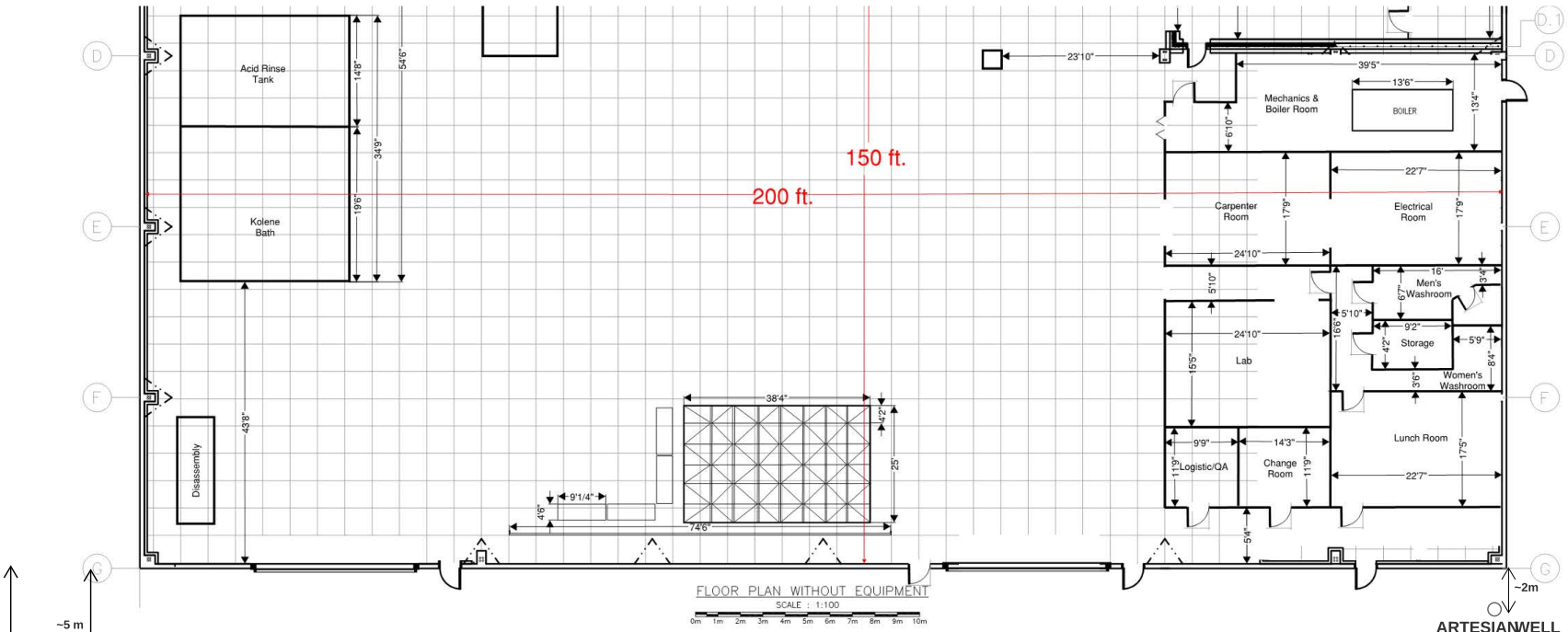
Scale: As Shown

PROJECT

DRAWING TITLE

Sheet of

PROJECT NO. DRAWING NO.



~5 m

"EXISTING WELL"
FOR PROCESS WATER

~27 m
DISTANCE FROM BLDG TO FIRE FIGHTING WELL

FIRE FIGHTING WELL

PLANT NORTH

NOTES	NOTES

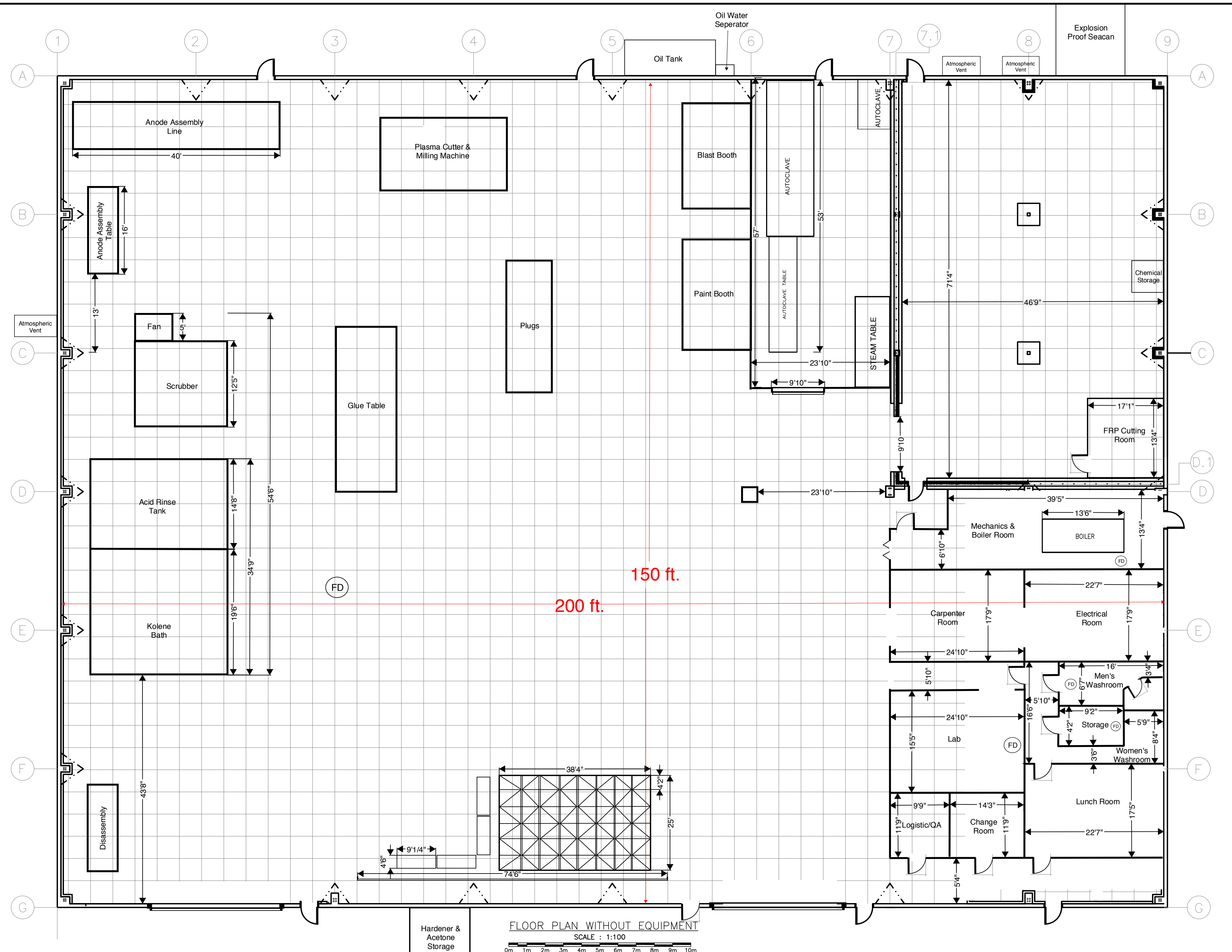
EASTERN COMPOSITE SERVICES

ECS - LONG HARBOUR WELL WATER PLAN

Drawn By: Michael O'Brien | Date: 01-11-2016

Chkd By: | Rev: 0

Dwg No.: 100-001-PLN-001A



MECHANICAL & ELECTRICAL CONSULTANT

CROSBIE ENGINEERING LTD.
CONSULTING ENGINEERS
21 Mews Place, 2nd Floor
P.O. Box 13295, Station "A"
St. John's, NL A1B 4A5
Tel: (709) 754-1911
Fax: (709) 754-1960
admin@crosbieeng.com

GENERAL NOTES:

1. DO NOT SCALE FROM THIS DRAWING.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE BEFORE PROCEEDING WITH THIS WORK.
3. ALL WORK TO BE IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF: THE NATIONAL BUILDING CODE OF CANADA, LATEST EDITION; CANADIAN ELECTRICAL CODE, CURRENT EDITION; ANY OTHER AUTHORITIES HAVING JURISDICTION.
4. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS ISSUED FOR CONSTRUCTION AND STAMPED AND SIGNED BY THE PROJECT ENGINEER.

PRELIMINARY
NOT FOR CONSTRUCTION

No.	DESCRIPTION	DATE	BY:
A	ISSUED FOR REVIEW	09/06/16	M.K.

REVISIONS

STAMP

REGISTERED PROFESSIONAL ENGINEER
DAVID A. SMITH
SIGNATURE
PROVINCE OF NEWFOUNDLAND

PERMIT

PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
Class "A"
This Permit Allows
CROSBIE ENGINEERING LIMITED
To practice Professional Engineering in Newfoundland and Labrador
Permit No. as issued by PEG-NL 00123 which is valid for the year 2016.

DRAWN BY:	M.KEATS	DATE:	APR. 2016
CHECKED BY:	N.CLEARY	DATE:	APR. 2016
APPROVED BY:	N.CLEARY	DATE:	APR. 2016
SCALE	AS NOTED		

A DETAIL NO.
B DRAWING NO. WHERE DETAIL REQUIRED
C DRAWING NO. WHERE DETAILED

PROJECT

LONG HARBOUR WAREHOUSE

LONG HARBOUR NL

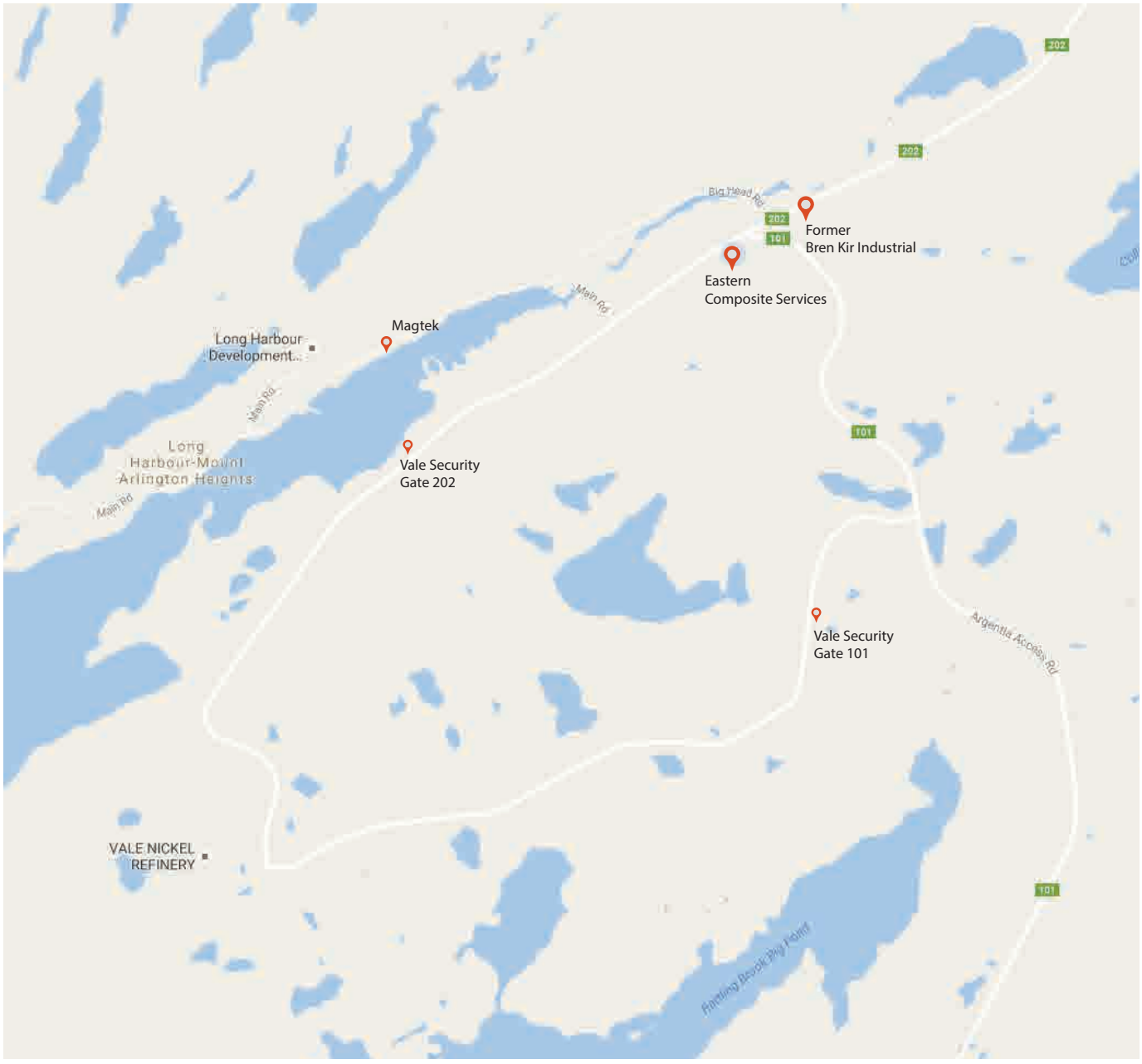
DRAWING TITLE

FLOOR PLAN WITHOUT EQUIPMENT

CEL PROJECT No.	DRAWING No.
16–2079	M–1

Eastern
Composite Services

Location



Eastern Composite Services is located at 542 Long Harbour Road, the intersection of Route 101 & 202 as shown on the map above.

Eastern
Composite Services

West Side

the west side of the building runs along Route 202 (Long Harbour Road) with services entering the building. Road access is from this location with emergency access at north end.

Eastern
Composite Services

South Side

The south side of the building shows the ventalation for the FRP shop.

The east side of the building

Service centre open area / Anode production area

FRP shop

Ventalation to south side of building