

Report to:

SHERWIN WILLIAMS CANADA INC.

**Brantford Plant Toxic Substances
Reduction Plan – Phase I & II
2014 Update**

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Report to:

SHERWIN WILLIAMS CANADA INC.

**BRANTFORD PLANT TOXIC
SUBSTANCES REDUCTION PLAN
PHASE I & II – 2014 UPDATE**

December 2014

Prepared by  Date December 13th, 2013
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REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION
1	Dec.-27-12	DM Dec.-20-12	AR Dec.-21-12	DL Dec.-21-12	Original Phase I Substances
2	Nov. 13.13	DM Nov.2013	JM Nov.2013	TS Dec.2013	Phase II Update
3	Dec.13.14	DM Nov.2014	JMnDec.2014	DM Dec. 2014	2014 update to add Naphthalene

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ATTACHMENT 1: PROCESS FLOW DIAGRAM

ATTACHMENT 2: CD WITH NPRI & TRA QUANTIFICATION SPREADSHEET

1.0 BASIC FACILITY INFORMATION

The Basic Facility information required under the Toxic Reduction Act is presented in the following section.

This Toxic Substance Reduction Plan covers the following group of substances which move through the facilities processes and operations together:

Table 1-1: Substances Covered in Plan

Substance Name	Chemical Abstracts Service (CAS) Number
Ethylbenzene	100-41-4
Toluene	108-88-3
Xylene, Total	1330-20-7
Acetone	67-64-1
Isopropyl Alcohol	67-63-0
n-Butyl Alcohol	71-36-3
i-Butyl Alcohol	78-83-1
Methyl Ethyl Ketone	78-93-3
1,2,4-Trimethylbenzene	95-63-6
Ethyl Alcohol	64-17-5
n-Butyl Acetate	123-86-4
Ethyl Acetate	141-78-6
Naphthalene	91-20-3

National Pollutant Release Inventory (NPRI) ID: 1562

MOE ID under Regulation 127/01 (Airborne Contaminant Discharge Monitoring and Reporting): 13391

The legal and trade names of the owner and the operator of the Facility (the "Facility"):

Owner: The Sherwin Williams Company

Operator: The Sherwin Williams Company

The street address of the Facility:

140 Garden Avenue,
Brantford, Ontario, N3S 7W4

The mailing address of the Facility:

The Sherwin Williams Company

140 Garden Avenue,
Brantford, Ontario, N3S 7W4

The number of full-time employee equivalents at the Facility:
57 full-time employee equivalents

The two- and four-digit North American Industry Classification System (NAICS) codes:
32 Manufacturing, Part 2
3255 Paints, Coatings and Adhesives

The six-digit NAICS Canada code:
325510 - Paint and Coating Manufacturing

The name, position and telephone number and mailing addresses for the following individuals:

- Public contact:
Bill Orr, Plant Manager
140 Garden Avenue
Brantford, Ontario N3S 7W4
T: 519-758-1508 x140
- Technical contact:
Dale Clark
140 Garden Avenue
Brantford, Ontario N3S 7W4
T: 519-758-1508 x140
- The person responsible for coordinating the plan preparation:
Mike Capacci, EHS Manager
140 Garden Ave
Brantford, Ontario N3S 7W4
T: (519) 761-8961; Fax: (519) 758-1490
- The person who prepared the plan, if different from coordinator:
Douglas McLaren, P.Eng.; Senior Air Quality Engineer; Tetra Tech Inc.
6835A Century Avenue
Mississauga, Ontario, L5N 2L2, Canada
T: (905) 369-3000 Fax: (905) 369-3200; doug.mclaren@tetrattech.com;
- Highest Ranking Employee at the Facility who has management responsibilities relating to the Facility and who is responsible for making the certification:
Bill Orr, Plant Manager;
140 Garden Avenue
Brantford, Ontario N3S 7W4
T: 519-758-1508 x140

The license number of the Toxic Reduction Planner who made recommendations:
TSRP0191

The license number of the planner who certified the plan:
TSRP0191

The spatial coordinates of the Facility in Universal Transverse Mercator (UTM) within a North American Datum 83 (NAD83) datum:
Zone 17; UTM Easting 564,198; UTM Northing 4,778,294

Latitude: 43° 9' 16.84" North
Longitude: 80° 12' 37.41" West

Canadian parent company:

- The legal name of the parent company:
The Sherwin Williams Company
- Street and mailing address of the company:
170 Brunel Road, Unit A
Mississauga, Ontario, L4Z 1T5
- What percentage of the Facility is owned by the parent company:
100%
- the business number assigned by Canada Customs and Revenue Agency:
104835277

2.0 STATEMENT OF INTENT

It is the intention of the Company to quantify and assess the creation, use, release and disposal of all toxic substances from the Facility, thereby gaining a more detailed understanding of the environmental footprint of its operations. Monitoring environmental performance through vigorous testing and identifying areas for improvement

The Company intends to systematically initiate programs/actions outlined in the plan to reduce the use of toxic substances where possible, systematically working from the recommendations of the hired Toxic Substance Reduction Planner and other specialists.

2.1 OBJECTIVES

The following Objectives have been developed to support specific items in the Statement of Intent.

1. Continue to pursue opportunities to replace toxic substances in product formulations with less hazardous materials.
2. Continue to pursue process improvements that will result in reductions in the quantity of toxic substances used, released, transferred or disposed of from the facility.

3.0 PROCESS DESCRIPTION

The facility is a paint and solvent batch mixing and blending facility, that currently produces approximately 8 million litres per year of paints, thinners, lacquers and stains for the wood finishing industry. The facility also includes a research and development laboratory for wood finishing products, which includes a full scale line production facility (the Application Area) for testing new products and applications for customers.

The main process involved in Sherwin Williams Brantford's production are:

1. Receiving bulk raw materials to storage tanks
 - a. Bulk chemical transfer from tanker trucks
2. Manufacturing
 - a. Production area mezzanine mixing tanks
 - b. Product letdown tanks
 - c. Production area floor mixing tanks
 - d. Product fill lines / packaging
3. Laboratories and Application Centre
4. Warehousing and storage of finished goods
 - a. Finished goods transported from production lines to shipping warehouse for storage.
5. Shipping of final product
 - a. Material is shipped direct to the customer using outside transport company.

The toxic substances identified in and covered under this plan are present as bulk raw materials and are used to manufacture solvent based paints which are transferred off-site as a product. These substances move through batching/mixing processes and their subsequent derivatives including process wastes.

- **Use of Substances:** Raw Materials
 - The Toxic substances are used in the manufacture of solvent based paints. These materials are stored on site in bulk storage tanks and the raw material warehouse (for small quantity materials). Ethylbenzene is an impurity found in the bulk Xylene used on site. Naphthalene is an ingredient in the Heavy Aromatic Naphtha used on site.
- **Release of Substances:** Bulk Material Receiving
 - The filling of bulk chemical storage tanks is expected to release emissions of the toxic substances to the atmosphere.

- **Release of substances: Mixing tanks (mezzanine)**
 - Toxic substances are pumped from the bulk, outdoor storage tanks to one of the high dispersion mix tanks located on the mezzanine in the production area. Bulk resins, various pigments, and other small amounts of products containing toxic substances are also added to the tanks to produce solvent based products. Emissions of the toxic substances are expected to be released during the mixing operations. These emissions are captured by the mixing tank dust collection system and released to the atmosphere via the primary baghouse exhaust.

- **Release of substances: Let down tanks**
 - Once products have been mixed, they are sent through a bead mill and then to let down tanks, where final adjustments are made with small quantities of solvents and flatteners prior to packaging. Emissions of toxic substances are released to the atmosphere via the letdown tank vents.

- **Release of substances: Product Filling (from Letdown tanks)**
 - All final products are filtered and packaged directly from the letdown tanks. Emissions of toxic substances from solvent based packaging are captured and released to atmosphere via passive exhaust vents on the letdown tanks and the primary dust collector systems.

- **Release of substances: Floor Mixing Tanks**
 - There are a number of small batch mixers located on the main production floor. These mixers range in size from 200 L to 1400 L. Each tank is brought to an ingredient fill station for the addition of the required materials and then returned to the mixing station. Emissions of toxic substances from floor mixing tanks are released during the mixing operations. These emissions are captured and vented via an exhaust system and released to the atmosphere.

- **Release of substances: Product Filling (small batches)**
 - Pigmented products prepared in the Floor Mixing Tanks are packaged at either the scissor lift, elevator packaging stations, where the mix tanks are tipped and gravity fed for packaging. Clear products prepared in the Floor Mixing Tanks are packaged at a separate packaging station. Emission of toxic substances from these operations are captured by local ventilation systems and released to atmosphere.

- **Release of substances: Bench Mixers**
 - There are nine (9) small bench mixers, each with nominal 20 – 40 L capacity used to mix very small quantity batches. Emission of toxic substances from these operations are captured by local ventilation systems and released to atmosphere.

- **Release of substances:** Application Centre, R&D Labs & QC Labs
 - The applications centre is used for testing paint and varnish product applications. The application centre includes a paint spray booth used to test product applications.
 - The R&D Labs include small batch mixing fume hoods, and paint booths for testing new products under development.
 - The Quality Control Labs operate a number of fume hoods and paint spray booths/hoods for testing production materials.
 - Emissions of toxic substances from these minor sources are released to the atmosphere.

- **Disposal of Substances:** Waste material disposals
 - Waste paint, old Quality Control samples, paint contaminated rags and sludge generated on site which contain the toxic substances are disposed of off-site to one of a number of waste recycling and disposal facilities.

- **Transfer of Substances:** Recycled materials for sale
 - Off-spec, mistinted and out of date materials that cannot be sold as Sherwin Williams product are transferred off-site for recycling or sale.

- **Transfer of Substances:** Shipping Product
 - Toxic substances contained in the finished product are shipped from the facility to customers via outside transport companies.

4.0 TOXIC SUBSTANCE ACCOUNTING

The following sections describe the stages of the operations that use, transfer, or release toxic substances from the site.

4.1 RECEIVING BULK RAW MATERIALS

Raw materials containing the toxic substances are received in bulk from chemical tanker trucks, as well as in small quantities in drums, buckets and other small quantity packaging on a regular basis.

4.1.1 STORAGE TANKS

The facility stores bulk raw materials including the toxic substances in question in large bulk storage tanks which are passively vented to atmosphere. Small quantity packaging containing toxic substances are stored, closed on racking in the warehouse.
Manufacturing

4.2 MANUFACTURING

4.2.1 PRODUCTION AREA MEZZANINE MIXING TANKS:

Raw materials including the toxic substances are either pumped from the bulk chemical storage tanks, or manually added from small containers (drums, buckets, etc...) to the mezzanine mixing tanks where other ingredients are added and mixed to specifications to manufacture paints to customer specifications.

4.2.2 PRODUCT LETDOWN TANKS:

Finished products containing the toxic substances are filtered and transferred to the letdown tanks. Solvent blends containing the toxic substances are also manufactured in these tanks.

4.2.3 PRODUCTION AREA FLOOR MIXING TANKS:

Small batches of coloured or custom paints are mixed using raw ingredients including the toxic substances in the floor mixing tanks.

4.2.4 *PRODUCT FILL LINES / PACKAGING:*

Finished products containing the toxic substances are packaged from either the product let down tanks or the floor filling stations.

4.3 LABORATORIES AND APPLICATION CENTRE

Small quantities of materials containing the toxic substances are tested against customer specifications in the Labs and the Application Centre on site. These materials are sprayed on a substrate in a paint booth which is vented to atmosphere.

4.4 WAREHOUSING AND STORAGE OF FINISHED GOODS AND SHIPPING

Finished goods containing the toxic substances are transported from the production filling lines to Shipping Warehouse for storage.

4.4.1 *SHIPPING OF FINAL PRODUCT:*

Products containing the toxic substances are shipped directly to the customer using outside Transport Company.

4.5 DISPOSAL OF WASTE MATERIALS

Waste materials containing the toxic substances generated on site are disposed of off-site to one of a number of waste recycling and disposal facilities.

4.6 OFF-SPEC MATERIAL FOR SALE

Off-spec, mis-tinted and out of date materials containing the toxic substances that cannot be sold as Sherwin Williams product are transferred off-site for sale to GDB International Inc..

5.0 QUANTIFICATION METHODS

Table 5-1: Quantification Methodology Reference is provided below for reference and includes the common acronyms used to simplify the descriptions of the quantification methodologies employed on-site. These acronyms are used throughout this document where necessary.

Table 5-1: Quantification Methodology Reference

Reference	Description
EPAEFA	US EPA AP-42 Emission Factors with a Quality Rating of "A"
EPAEFB	US EPA AP-42 Emission Factors with a Quality Rating of "B"
EPAEFC	US EPA AP-42 Emission Factors with a Quality Rating of "C"
EPAEFD	US EPA AP-42 Emission Factors with a Quality Rating of "D"
EPAEFE	US EPA AP-42 Emission Factors with a Quality Rating of "E"
SECEF	Manufacturer Supplier Maximum Emission Rate Guarantee
ENGCAL	Engineering Calculation
MASS	Mass Balance based on materials input and output to and from the system in question
MV	Measured Value or combination of measured value and measured activity (e.g. measured concentration and flow data)

5.1 PROCESS SPECIFIC QUANTIFICATIONS

The following sections describe the quantification methodology, or combination of methodologies employed by the company in estimating the quantities of toxic substances from the use, creation or destruction of them on the Facility site and from releases, transfers and disposals of them off-site.

5.1.1 RECEIVING BULK RAW MATERIALS

The total Use of the toxic substances is estimated based on a mass balance around the quantity of raw materials containing toxic substances received during the year as well as the consumption of existing inventory. The mass of raw materials consumed is multiplied by the concentration of the toxic substance in the raw material.

Use of Toxic Substance: $\sum_x [\text{Mass of Raw Material}_x \times \text{Mass Fraction (\%)} \text{ of Toxic Substance in Raw Material}_x]$

Methodology: MASS

5.1.2 STORAGE TANKS

The release of toxic substances for the passive venting of bulk storage tanks on site is estimated based on the emission estimation methodologies presented in the US EPA's AP 42, Fifth Edition, Volume I, Chapter 7: Liquid Storage Tanks using the TANKS Modelling Software. As this model is designed to calculate tank emissions using fundamental engineering principals taking real word variables into account this method is expected to have a data quality rating of "A".

Release of Toxic Substance: US EPA TANKS Model
Methodology: EPAEFA

5.1.3 MANUFACTURING

The release of the toxic substances from manufacturing operations is estimated based on an Engineering Calculation using the total quantity of materials used in the manufacturing processes and a fractional Yield Loss which is estimated to be proportional to the vapour pressure of the substance in question.

Release of Toxic Substance: $\text{Mass of Raw Material}_x \times \text{Mass Fraction (\%)} \text{ of Toxic Substance in Raw Material}_x \times \text{Yield Loss (\%)}$
Methodology: ENGCAL

5.1.4 LABORATORIES AND APPLICATION CENTRE

The release of toxic substances from the spraying of materials in the Labs and the Application Centre on site are estimated using on an engineering estimate based on the total quantity of material sprayed, the fractional quantity of raw materials consumed in manufacturing, the concentration of toxic substance in the raw materials and the conservative assumption that 100% of the substance will be released to the atmosphere.

Release of Toxic Substance: $\text{Total Mass of Material Sprayed} \times \text{Mass of Raw Material}_x \text{ used in Manufacturing} \div \text{Total Mass of all Raw Materials used in Manufacturing} \times \text{Mass Fraction (\%)} \text{ of Toxic Substance in Raw Material}_x \times 100\% \text{ Release}$
Methodology: ENGCAL

5.1.5 OFF-SPEC MATERIALS FOR SALE

The Transfer of the toxic substance from the facility in the form of Off-Spec materials for sale is estimated based on a mass balance around the quantity of this material transferred off site for sale, the fraction of the volatile material that is composed of the toxic substance and the fraction of the total material that is volatile.

Transfer of Toxic Substance: Mass of Material Transferred x Volatile Fraction (100 - % Solid) x Mass fraction (%) of Toxic Substance in the Volatile Fraction

Methodology: MASS

5.1.6 WASTE MATERIALS DISPOSAL

The transfer of toxic substances from the facility for disposal is estimated based on a mass balance around the quantity of this material transferred off site for recycling or disposal, the fraction of the volatile material that is composed of the toxic substance and the fraction of the total material that is volatile.

Transfer of Toxic Substance: Mass of Material Transferred x Volatile Fraction (100 - % Solid) x Mass fraction (%) of Toxic Substance in the Volatile Fraction

Methodology: MASS

5.1.7 FINAL PRODUCT SHIPPING

The quantity of toxic substances transfer off site as final products is estimated based on a mass balance around the quantity of the toxic substance used, the amount that is released to air and the amounts transferred off site for disposal and sale as off-spec product.

Transfer of Toxic Substance: Mass of Substance Used – Total Mass of Substance Released to Air – Mass of Substance Transferred for Disposal – Mass of Substance Transferred for Sale as Off-Spec Product

Methodology: MASS

5.2 RECORD OF METHODS

The ***NPRI & Toxic Reduction Act (TRA) Quantifications Spreadsheet*** is used to track and calculate the quantifications used in this plan. The methodologies employed in estimating the use, release and transfers of toxic substances from the Facility are laid out in the NPRI & Toxic Reduction Act (TRA) Quantifications Spreadsheet.

This spreadsheet is to be updated and archived each year as required by the NPRI and TRA. Upon completion of each year's update, a copy of the final spreadsheet is to be stored on a solid state electronic storage or other electronic media in an archived form to prevent further changes.

See **Attachment 2** for a copy of the most recent ***NPRI & TRA Quantifications Spreadsheet***.

5.3 NO APPROXIMATE BALANCE

Due to the use of a mass balance calculation to estimate the transfer of final products for sale, there are no instances of No Approximate Balance of inputs and outputs of toxic substances quantified in this plan.

See **Attachment 2** for a copy of the most recent NPRI & TRA Quantifications Spreadsheet.

6.0 DIRECT AND INDIRECT ANNUAL COST

The following direct and indirect annual costs associated with the use, release and transfer of toxic substances from the Facility have been identified. Based on the available accounting data, the typical annual costs associated with the Toxic Substances covered under this plan are approximately **\$9,237,200** (based on 2012 data).

Creation and Destruction of Toxic Substances:

The Facility does not create or destroy toxic substances, and therefore do not have any related costs under this category.

Use of Toxic Substances:

The annual costs associated with the use of the toxic substances have been estimated based on the facility accounting data available. The total annual cost associated with the use of toxic substances is approximately **\$9,173,300** based on the purchase of raw materials containing these substances. Table 6-1: Cost of Toxic Substance Use below provides the breakdown of cost by toxic substance.

Table 6-1: Cost of Toxic Substance Use

Substance Name	Annual Cost of Use (CAD \$)
Ethylbenzene	\$158,200
Toluene	\$243,800
Xylene, Total	\$904,500
Acetone	\$395,400
Isopropyl Alcohol	\$272,900
n-Butyl Alcohol	\$288,400
i-Butyl Alcohol	\$73,400
Methyl Ethyl Ketone	\$62,100
1,2,4-Trimethylbenzene	\$88,800
Ethyl Alcohol	\$2,725,200
n-Butyl Acetate	\$3,638,600
Ethyl Acetate	\$322,000
Naphthalene	\$50,000

Releases of Toxic Substances:

The annual cost associated with the releases of toxic substances is currently unknown as this data is currently not tracked.

Disposals of Toxic Substances:

The annual costs associated with the disposal of toxic substances have been estimated based on the approximate concentrations of each substance in the materials disposed of and the total cost of disposals. Table 6-2: Cost of Toxic Substance Disposal below provides the estimated costs associated with the disposal of each toxic substance covered under this plan.

Table 6-2: Cost of Toxic Substance Disposal

Substance Name	Annual Cost of Disposals (CAD \$)
Ethylbenzene	\$1,000
Toluene	\$1,400
Xylene, Total	\$5,500
Acetone	\$2,100
Isopropyl Alcohol	\$1,500
n-Butyl Alcohol	\$1,600
i-Butyl Alcohol	\$0
Methyl Ethyl Ketone	\$400
1,2,4-Trimethylbenzene	\$400
Ethyl Alcohol	\$12,700
n-Butyl Acetate	\$35,800
Ethyl Acetate	\$1,500
Naphthalene	\$0

Transfer of Toxic Substances:

There are no costs associated with the off-site transfer of either Final Products or off-spec / out of date Product for sale to customers including GDB International Inc. The toxic substances contained in these materials are sold as formulated ingredients and have no negative costs associated with them.

7.0 TOXIC REDUCTION OPTIONS

The Toxic Reduction Act requires facilities to consider at least seven (7) toxic reduction categories or provide an explanation of why no option could be identified. Options identified under each of these seven (7) toxic reduction categories are examined below.

7.1 MATERIALS OR FEEDSTOCK SUBSTITUTIONS

- Substituting Toxic Substances currently used with another comparable chemical that is less toxic and will not compromise the quality or manufacturing cost of the finished product it is used in.
 - The plant is able to substitute Toluene and Xylene with a less hazardous material-Butyl Acetate, in some formulas, but not all. All new formulas or upon customer request, we will use this substitution.

7.2 PRODUCT DESIGN OR REFORMULATION

- Formulate all new products without TRA listed chemicals or reduce amounts used where possible.

7.3 EQUIPMENT OR PROCESS MODIFICATION

- Shorten flexible hose lengths to reduce the amount of product left in the hoses.
- Inert all bulk tanks to eliminate yield loss.
- Install high level alarms on all bulk storage tanks and interlock them and the inlet valves with the filling pump to automatically shut off filling if the alarm activates.
- Install fire rated air-open-spring-close type valves. In addition, interlock process tank valves with the fire alarm so that they automatically shut if a fire occurs.
- Install an automatic deluge system or water monitor system that cools the tanks.
- Review the tank integrity testing program to determine if the frequency of testing and visual inspections is adequate. Conduct required visual inspections and testing per the established frequency.
- Fill product from tanks DD601 and DD801 at the small clear filling area to eliminate yield loss.
- Review material handling operations to reduce product loss and spills of finished goods.
- Investigate returning unused quality samples to the mix instead of disposing in lab.

7.4 SPILL AND LEAK PREVENTION

- Add locked caps on all valves to Spill Response Procedure
- Conduct hose and transfer site inspections
- Repair cracks or breaks in the concrete in all of the containment structures as part of preventative maintenance measures using a chemically compatible sealant. Install a lockable valve for the pump house dike.

7.5 ON-SITE REUSE AND RECYCLING

- Reuse tank washing solvent (applicable to methanol, isopropyl alcohol, n-butyl alcohol, methyl-ethyl ketone, 1,2,4-trimethylbenzene and methyl-isobutyl ketone)
- Sell overstock, out-of-date stock, mis-tints to GDB International Inc.

7.6 INVENTORY MANAGEMENT

- Conduct monthly audits of shelf life of finished goods. Rework product that is close to the end of its shelf life into new batches.
- Reduce the amount of inventory stocked to eliminate product expiration

7.7 TRAINING

- Spill Response
- Reduce Solvent Vapours in the Working Environment
- Management of Regulated Waste
- Containment Area Management And Inspection
- Daily inspections
- Emergency and Evacuation Contingency Policy
- Shipping & Receiving
- Purchasing of Raw Materials
- PLC Panel Operation
- Batch making including mixing, milling and filling

8.0 IDENTIFICATION OF TECHNICALLY FEASIBLE OPTIONS

Below are the Toxic Substance Reduction Options that have been identified as being Technically Feasible.

8.1 PRODUCT DESIGN OR REFORMULATION:

- Formulate all new products without TRA listed chemicals or reduce amounts used where possible.

8.2 EQUIPMENT OR PROCESS MODIFICATION

- Shorten flexible hose lengths to reduce the amount of product left in the hoses.
- Inert all bulk tanks to eliminate yield loss
- Install fire rated air-open-spring-close type valves. In addition, interlock process tank valves with the fire alarm so that they automatically shut if a fire occurs.
- Install an automatic deluge system or water monitor system that cools the tanks.
- Fill product from tanks DD601 and DD801 at the small clear filling area to eliminate yield loss
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- Investigate returning unused quality samples to the mix instead of disposing in lab.

8.3 SPILL AND LEAK PREVENTION

- Install high level alarms on all bulk storage tanks and interlock them and the inlet valves with the filling pump to automatically shut off filling if the alarm activates
- Repair cracks or breaks in the concrete in all of the containment structures as part of preventative maintenance measures using a chemically compatible sealant. Install a lockable valve for the pump house dike.
- Review the tank integrity testing program to determine if the frequency of testing and visual inspections is adequate. Conduct required visual inspections and testing per the established frequency.
- Add locked caps on all valves to Spill Response Procedure
- Conduct hose and transfer site inspections

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- Reuse tank washing solvent (applicable to methanol, isopropyl alcohol, n-butyl alcohol, methyl-ethyl ketone, 1,2,4-trimethylbenzene and methyl-isobutyl ketone)
- Sell overstock, out-of-date stock, mis-tints to GDB

8.5 INVENTORY MANAGEMENT

- Conduct monthly audits of shelf life of finished goods. Rework product that is close to the end of its shelf life into new batches.
- Reduce the amount of inventory stocked to eliminate product expiration

8.6 TRAINING

- Spill Response
- Reduce Solvent Vapours in the Working Environment
- Management of Regulated Waste
- Containment Area Management And Inspection
- Daily inspections
- Emergency and Evacuation Contingency Policy
- Shipping & Receiving
- Purchasing of Raw Materials
- PLC Panel Operation
- Batch making including mixing, milling and filling

9.0 IDENTIFICATION OF ECONOMICALLY FEASIBLE OPTIONS

Below are the Toxic Substance Reduction Options that have been identified as being Economically Feasible.

9.1 PRODUCT DESIGN OR REFORMULATION

- Formulate all new products without TRA listed chemicals or reduce amounts used where possible.

9.2 EQUIPMENT OR PROCESS MODIFICATION

- Shorten flexible hose lengths to reduce the amount of product left in the hoses.
- Install fire rated air-open-spring-close type valves. In addition, interlock process tank valves with the fire alarm so that they automatically shut if a fire occurs.
- Fill product from tanks DD601 and DD801 at the small clear filling area to eliminate yield loss.
- Review material handling operations to reduce product loss and spills of finished goods.
- Investigate returning unused quality samples to the mix instead of disposing in lab.

9.3 SPILL AND LEAK PREVENTION

- Install high level alarms on all bulk storage tanks and interlock them and the inlet valves with the filling pump to automatically shut off filling if the alarm activates.
- Repair cracks or breaks in the concrete in all of the containment structures as part of preventative maintenance measures using a chemically compatible sealant. Install a lockable valve for the pump house dike.
- Review the tank integrity testing program to determine if the frequency of testing and visual inspections is adequate. Conduct required visual inspections and testing per the established frequency.
- Add locked caps on all valves to Spill Response Procedure.
- Conduct hose and transfer site inspections.

9.4 ON-SITE REUSE AND RECYCLING

- Reuse tank washing solvent (applicable to methanol, isopropyl alcohol, n-butyl alcohol, methyl-ethyl ketone, 1,2,4-trimethylbenzene and methyl-isobutyl ketone).
- Sell overstock, out-of-date stock, mis-tints to GDB

9.5 INVENTORY MANAGEMENT

- Conduct monthly audits of shelf life of finished goods. Rework product that his close to the end of its shelf life into new batches.
- Reduce the amount of inventory stocked to eliminate product expiration.

9.6 TRAINING

- Spill Response.
- Reduce Solvent Vapours in the Working Environment.
- Management of Regulated Waste.
- Containment Area Management And Inspection.
- Daily inspections.
- Emergency and Evacuation Contingency Policy.
- Shipping & Receiving.
- Purchasing of Raw Materials.
- PLC Panel Operation.
- Batchmaking including mixing, milling and filling.

10.0 OPTION(S) TO BE IMPLEMENTED

The following Toxic Substance Reduction Options which have been identified as being both technically and economically feasible are to be implemented. It is expected that the implementation of these options will result in a reduction in the quantities of Toxic Substances used, released, and disposed of from the facility.

10.1 PRODUCT DESIGN OR REFORMULATION

- Formulate all new products without using TRA listed chemicals or reduce amounts used where possible.
 - **Completed in 2013 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will result in the elimination of these toxic substances from all new products. In time this could result in the virtual elimination of these toxic substances from the facility.

10.2 EQUIPMENT OR PROCESS MODIFICATION

- Shorten flexible hose lengths to reduce the amount of product left in the hoses.
 - **Completed in 2013**
 - **Toxic Reduction Estimate:** Implementation of this option will result in a reduction in the quantity of waste materials generated by residual materials left in hoses and reduced quantities of solvent required to clean the lines.
- Install fire rated air-open-spring-close type valves. In addition, interlock process tank valves with the fire alarm so that they automatically shut if a fire occurs.
 - **Completed in 2012**
 - **Toxic Reduction Estimate:** Implementation of this option will result in a reduction in the quantity of materials released to the environment via spills during a fire. However; as no released via spills/fires were recorded no estimate of Toxic Reductions is possible.
- Fill product from tanks DD601 and DD801 at the small clear filling area to eliminate yield loss
 - **Completed in 2013**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the quantity of substances used by reducing yield losses during product filling operations. However as this data is not currently tracked, no estimate of Toxic Reductions is possible.

- Review material handling operations to reduce product loss and spills of finished goods.
 - **Plant is prepared to implement this option in 2014**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the quantity of substances used by reducing the quantity of materials lost to waste from material handling operations. The quantities of material lost from the process as a result of material handling losses are not currently tracked. As such no estimate of toxic reductions from this option can be made.
- Investigate returning unused quality samples to the mix instead of disposing in lab.
 - **Plant is prepared to implement this option in 2014**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the quantity of substances used by reducing the quantity of materials disposed of from the quality lab and reintroducing that material back into the manufacturing process. As the quantities of samples collected are not tracked, no estimate of toxic reductions from this option can be made.

10.3 SPILL AND LEAK PREVENTION

- Install high level alarms on all bulk storage tanks and interlock them and the inlet valves with the filling pump to automatically shut off filling if the alarm activates.
 - **Completed in 2012**
 - **Toxic Reduction Estimate:** Implementation of this option will result in the elimination of toxic substances released to the environment via spills to containment areas. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.
- Repair cracks or breaks in the concrete in all of the containment structures as part of preventative maintenance measures using a chemically compatible sealant. Install a lockable valve for the pump house dike.
 - **Completed in 2012**
 - **Toxic Reduction Estimate:** Implementation of this option will result in the elimination of toxic substances released to the environment via spills to containment areas. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.
- Review the tank integrity testing program to determine if the frequency of testing and visual inspections is adequate. Conduct required visual inspections and testing per the established frequency. The site had previously identified the condition of several of the tanks through a CIP and has scheduled them for testing in 2012.

- **Completed in 2012**
- **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.

- Add locked caps on all valves to Spill Response Procedure.
 - **Completed in 2013 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.

- Conduct hose and transfer site inspections.
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.

10.4 ON-SITE REUSE AND RECYCLING

- Reuse tank washing solvent (applicable to methanol, isopropyl alcohol, n-butyl alcohol, methyl-ethyl ketone, 1,2,4-trimethylbenzene and methyl-isobutyl ketone).
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will result in a reduction in the quantity of toxic substances used on site by an amount equal to the quantity of wash solvent reused. This amount is currently unknown due to lack of data as this was not being tracked.

- Sell overstock, out-of-date stock, mis-tints to GDB.
 - **Completed in 2013 and ongoing**
 - **Toxic Reduction Estimate: Toxic Reduction Estimate:** Implementation of this option will reduce the quantity of Toxic Substances transferred off-site for disposal. It is estimated that the up to 90% of the materials currently disposed of off-site for recycling could be sold as product to GDB.

10.5 INVENTORY MANAGEMENT

- Conduct monthly audits of shelf life of finished goods. Rework product that his close to the end of its shelf life into new batches.
 - **Completed in 2012 and ongoing**

- Implementation of this option will result in a reduction in the quantity of toxic substances used on site by an amount equal to the quantity of product that typically expires and required disposal or recycling. This amount is currently unknown due to lack of data as this was not being tracked.
- Reduce the amount of inventory stocked to eliminate product expiration.
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will result in a reduction in the quantity of toxic substances used on site by an amount equal to the quantity of product that typically expires and required disposal or recycling. This amount is currently unknown due to lack of data as this was not being tracked.

10.6 TRAINING

- Spill Response
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.
- Reduce Solvent Vapours in the Working Environment
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the use of toxic substances by reducing fugitive releases to air. The amount is currently unknown due to lack of data as this was not being tracked.
- Management of Regulated Waste
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.
- Containment Area Management And Inspection
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.
- Daily inspections

- **Completed in 2012 and ongoing**
- **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.

- Emergency and Evacuation Contingency Policy
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequent releases to the environment, waste disposal off-site. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.

- Shipping & Receiving
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will contribute to the success of the other Inventory Improvement Options and will help achieve the expected reduction in the quantity of toxic substances used on site by an amount equal to the quantity of product that typically expires and required disposal or recycling. The amount is currently unknown due to lack of data as this was not being tracked.

- Purchasing of Raw Materials
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will contribute to the success of the other Inventory Improvement Options and will help achieve the expected reduction in the quantity of toxic substances used on site by an amount equal to the quantity of product that typically expires and required disposal or recycling. The amount is currently unknown due to lack of data as this was not being tracked.

- PLC Panel Operation
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks associate with operator error resulting in out of spec product, excessive losses from upsets, spills of materials and subsequent waste generation. However; as there are no direct record of these, no estimate of Toxic Reductions is possible.

- Batch making including mixing, milling and filling
 - **Completed in 2012 and ongoing**
 - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks associate with operator error resulting in out of spec product, excessive losses from upsets, spills of materials and subsequent waste generation. However; as there are no direct record of these, no estimate of Toxic Reductions is possible.

11.0 RECOMMENDATIONS


The following recommendations have been developed to help improve the quality of data the accuracy of the emission estimates used in preparing the plan.

1. Additional accounting data on the costs associated with disposal and transfers of toxic substances from the facility should be collected / tracked in order to further inform the facility as to the full costs of using these substances. The current estimates are based on a simple prorating of total disposal costs by the estimated concentration of toxic substances in each waste stream
2. The facility should consider developing an updated methodology for estimating the transfer of toxic substances contained in products leaving the site. The current methodology relies on a simplified mass balance. An updated methodology employing an accounting of the quantity of toxic substances in the final product transferred from the facility should be developed to eliminate the lack of “No Approximate Balance” caused by the use of the existing mass balance.
3. The facility should consider tracking data on the use and recycling of wash solvent. This data could be used to quantify the amount of toxic substance reduced under toxic reduction options and aid in providing financial justification for implementing related toxic substance reduction options.

12.0 CERTIFICATIONS

This Toxic Substance Reduction Plan Summary accurately reflects the current version of the Toxic Substance Reduction Plan.

As of DECEMBER 23, 2014 (Date), I Bill Orr, certify that I have read the Toxic Substance Reduction Plan for the toxic substance(s) referred to below and am familiar with its contents, and to my knowledge the plan is factually accurate and complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.




 Bill Orr, Plant Manager

12/23/14

 Date

As of December 31st, 2014, I Douglas McLaren, certify that I am familiar with the processes at the Sherwin Williams Brantford Facility that use or create the toxic substance referred to below, that I agree with the estimates referred to in subparagraphs 7 iii, iv and v of subsection 4(1) of the Toxics Reduction Act, 2009 that are set out in the plan dated November 15th, 2013 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under the Act.



 Douglas McLaren, P.Eng. Toxic Substance
 Reduction Planner

December 13th, 2014

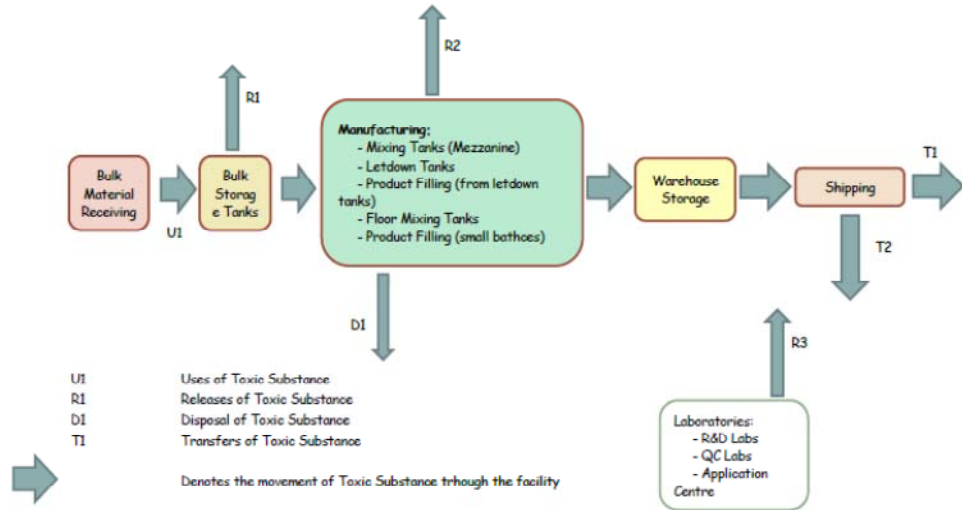
 Date

Substance Name	Chemical Abstracts Service (CAS) Number
Ethylbenzene	100-41-4
Toluene	108-88-3
Xylene, Total	1330-20-7
Acetone	67-64-1
Isopropyl Alcohol	67-63-0
n-Butyl Alcohol	71-36-3
i-Butyl Alcohol	78-83-1

Substance Name	Chemical Abstracts Service (CAS) Number
Methyl Ethyl Ketone	78-93-3
1,2,4-Trimethylbenzene	95-63-6
Ethyl Alcohol	64-17-5
n-Butyl Acetate	123-86-4
Ethyl Acetate	141-78-6
Naphthalene	91-20-3

Attachment 1

2013 Reporting Year					
U1 - Material	67,551 kg Ethylbenzene 89,146 kg Toluene 385,893 kg Xylene 10,485 kg Naphthalene	150,193 kg Acetone 109,654 kg Isopropyl Alcohol 125,631 kg n-Butyl Alcohol	31,622 kg i-Butyl Alcohol 26,219 kg Methyl Ethyl Ketone 48,511 kg 1,2,4-Trimethylbenzene	1,100,582 kg Ethyl Alcohol 1,503,893 kg n-Butyl Acetate 130,964 kg Ethyl Acetate	
R1 - Tank Emissions	25 kg Ethylbenzene 20 kg Toluene 118 kg Xylene 0 kg Naphthalene	153 kg Acetone 0 kg Isopropyl Alcohol 23 kg n-Butyl Alcohol	0 kg i-Butyl Alcohol 0 kg Methyl Ethyl Ketone 0 kg 1,2,4-Trimethylbenzene	0 kg Ethyl Alcohol 60 kg n-Butyl Acetate 0 kg Ethyl Acetate	
R2 - Manufacturing Emissions	236 kg Ethylbenzene 456 kg Toluene 1,133 kg Xylene 1 kg Naphthalene	4,621 kg Acetone 1,032 kg Isopropyl Alcohol 298 kg n-Butyl Alcohol	192 kg i-Butyl Alcohol 339 kg Methyl Ethyl Ketone 11 kg 1,2,4-Trimethylbenzene	15,128 kg Ethyl Alcohol 4,452 kg n-Butyl Acetate 1,421 kg Ethyl Acetate	
R3 - Laboratory Emissions	6 kg Ethylbenzene 8 kg Toluene 34 kg Xylene 0 kg Naphthalene	17 kg Acetone 9 kg Isopropyl Alcohol 10 kg n-Butyl Alcohol	3 kg i-Butyl Alcohol 2 kg Methyl Ethyl Ketone 4 kg 1,2,4-Trimethylbenzene	91 kg Ethyl Alcohol 120 kg n-Butyl Acetate 11 kg Ethyl Acetate	
D1 - Disposal of Waste	1276 kg Ethylbenzene 1603 kg Toluene 7,206 kg Xylene 189 kg Naphthalene	2,639 kg Acetone 1,889 kg Isopropyl Alcohol 2,182 kg n-Butyl Alcohol	566 kg i-Butyl Alcohol 452 kg Methyl Ethyl Ketone 865 kg 1,2,4-Trimethylbenzene	19,341 kg Ethyl Alcohol 80,314 kg n-Butyl Acetate 2,367 kg Ethyl Acetate	
T1 - Transfer of Product	66,008 kg Ethylbenzene 87,059 kg Toluene 377,401 kg Xylene 10,295 kg Naphthalene	142,763 kg Acetone 106,724 kg Isopropyl Alcohol 123,118 kg n-Butyl Alcohol	30,861 kg i-Butyl Alcohol 25,426 kg Methyl Ethyl Ketone 47,631 kg 1,2,4-Trimethylbenzene	1,065,942 kg Ethyl Alcohol 1,418,947 kg n-Butyl Acetate 127,164 kg Ethyl Acetate	
T2 - Transfer Off-Spec Product	0 kg Ethylbenzene 0 kg Toluene 0 kg Xylene 0 kg Naphthalene	0 kg Acetone 0 kg Isopropyl Alcohol 0 kg n-Butyl Alcohol	0 kg i-Butyl Alcohol 0 kg Methyl Ethyl Ketone 0 kg 1,2,4-Trimethylbenzene	0 kg Ethyl Alcohol 0 kg n-Butyl Acetate 0 kg Ethyl Acetate	



Attachment 2

NPRI & TRA Quantifications Spreadsheet

Attach CD Here

