REPORT TO:

SHERWIN WILLIAMS CANADA INC.

FORT ERIE PLANT TOXIC SUBSTANCES
REDUCTION PLAN –2017 UPDATE
DOCUMENT NO. 1796950300-REP-V0001-00

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FORT ERIE PLANT TOXIC SUBSTANCES REDUCTION PLAN 2017 UPDATE

Prepared by	Douglas McLaren, P.Eng.	Date	September 25, 2017
Reviewed by	Ryan Wizbicki, B.Sc.Eng.	Date	January 15, 2018
Authorized by	Ryan Wizbicki, B.Sc.Eng.	Date	January 15, 2018

6835A Century Avenue, Mississauga, Ontario, L5N 2L2, Canada
Phone: 905.369.3000 Fax: 905.369.3200

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.13.13.	BH Dec.20.13	BH Dec.21.13	Phase II Update for review
3	Oct.09.14	DM Oct.09.14	JM Dec. 10.14	DM Dec.12.14	Addition of new Substance (Sulphuric Acid)
4	Dec.31.17	DM Sep.25.17	RW Jan.15.18	RW Jan.15.18	Addition of new Substances (Hexane, Cobalt and NPE)

TETRA TECH

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1.0 BASIC FACILITY INFORMATION

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

This Toxic Substance Reduction Plan covers the following group of substances:

Table 1-1: Substances Covered in Plan

Substance Name	Chemical Abstracts Service (CAS) Number
Acetone	67-64-1
2-Butoxyethanol	111-76-2
n-Butyl Acetate	123-86-4
i-Butyl Alcohol	78-83-1
n-Butyl Alcohol	71-36-3
Cobalt (and its compounds)	N/A
Dibutyl Phthalate	84-74-2
Ethyl Acetate	141-78-6
Ethyl Alcohol	64-17-5
Ethylbenzene	100-41-4
Hexane	110-54-3
Isopropyl Alcohol	67-63-0
Methanol	67-56-1
Methyl Ethyl Ketone	78-93-3
Methyl Isobutyl Ketone	108-10-1
Nonylphenol and its Ethoxylates	N/A
Solvent naphtha light aliphatic	64742-89-8
Sulphuric Acid	7664-93-9
1,2,4-Trimethylbenzene	95-63-6
Toluene	108-88-3
Xylene	1330-20-7

National Pollutant Release Inventory (NPRI) ID: 1931

MOE ID under Regulation 127/01 (Airborne Contaminant Discharge Monitoring and Reporting): 4213

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 and mailing address of the Facility:

The Sherwin Williams Company
224 Catherine Street
Fort Erie, Ontario, L2A 0B1

The number of full-time employee equivalents at the Facility:
48 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:
  Dave MacDonald, Plant Manager
  224 Catherine Street
  Fort Erie, Ontario, L2A 0B1
  T: 519-758-1508 x140

- Technical contact:
  Mike Capacci, EHS Manager
  140 Garden Ave
  Brantford, Ontario N3S 7W4
  T: (519) 761-8961; Fax: (519) 758-1490

- 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 Canada Inc.
  6835A Century Avenue, Mississauga, Ontario, L5N 2L2, Canada
  Phone: 416.219.2793 Fax: 905.369.3200
  Doug.mclaren@ttemi.com

- Highest Ranking Employee at the Facility who has management responsibilities relating to the Facility and who is responsible for making the certification:
  Dave MacDonald, Plant Manager
  224 Catherine Street
  Fort Erie, Ontario, L2A 0B1
  T: 519-758-1508 x239

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

The license number of the Toxic Reduction 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 668,902; UTM Northing 4,753,731

Latitude: 42.9175 North
Longitude: 78.9306 West

Canadian parent company (the "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 for this Toxic Substances Reduction Plan.

1. Continue to pursue opportunities to replace toxic substances in product formulation 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 manufactures paints, varnishes, stains, lacquers and related products for industrial, commercial and consumer use. Markets are primarily in wood finishing. Products are either solvent or water-based. Raw materials including solvents, resins and additives are mixed to formula to create various stains and paint coatings. The mixing is performed in batches, pumped into holding tanks, drums, totes or small containers, and then stored in the warehouse awaiting shipment. A training centre was added to the existing facility building prior to 2012. Activities taking place in the training centre include paint spraying, cleaning, drying, mixing and sanding, but all on a small, non-production scale.

The main processes involved in Facility processing are:

1. Receiving Bulk Quantities of Toxic Substances to Bulk Storage Tanks
    a. Bulk chemical transfer to tanker trucks
2. Main Manufacturing & Stain Department
    a. Batch mixing operations
    b. Product filling and packaging
    c. Solvent washing operations
3. Laboratories and Training Centre
4. Warehousing and Storage of Finished Goods
    a. Finished goods are transported from production lines to shipping warehouse for storage
5. Shipping of Final Product
    a. Material is shipped directly to customer using 3rd party transport company.

The toxic substances identified in and covered under this Toxic Substances Reduction 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 process and their subsequent derivatives including process wastes.

- **Use of Substances:** Raw Materials
    - The Toxic substances used in the manufacture of solvent based paints and stains, with the exception of Ethylbenzene, are purchased as raw materials and functional components of raw materials. These materials are stored on site in bulk storage tanks and in smaller quantities in the raw material warehouse.
        - Ethylbenzene is an impurity found in the bulk Xylene used on site.
        - Sulphuric Acid is stored on site in 35 kg polypropylene containers in the main raw materials warehouse.
- **Release of Substances:** Bulk Material Receiving
    - The filing of bulk chemical storage tanks is expected to release emissions of the toxic substances to the atmosphere.

- **Release of Substances:** Main Production and Stain Department
    - The toxic substances are either pumped from the bulk, outdoor storage tanks or manually added to batch mixing tanks in Production. The toxic substances are released to the atmosphere during mixing operations. Emissions are captured via the Dust Collector system and are released to the atmosphere via an exhaust stacks on the roof.

- **Release of Substances:** Product Filling and Packaging
    - Finished products are filled into drums, and other smaller packaging for sale to customers. Emissions of toxic substances are captured by local ventilation systems and are released to atmosphere during packaging operations.

- **Release of Substances:** Solvent Washing Operations
  - The facility utilized reclaimed solvent to wash tanks, lines and equipment contaminated with paints and stains when necessary. Emissions of toxic substances are released to atmosphere during these solvent washing operations.

- **Release of Substances:** Lab Spray Booth(s) and Fume Hoods
  - Emissions of toxic substances are released to atmosphere during product quality testing and during test batch mixing operations collected via fume hoods and released to atmosphere.

- **Release of Substances:** Training Centre
  - The facility uses materials containing the toxic substances in the various areas of the new training centre. The Emissions of toxic substances are released to atmosphere during training exercises, in the following areas
    - Primer & Stain Spray Booth(s);
    - Cleanup Room and Stain Area;
    - Drying racks;
    - Colour mixing; and the
    - Auto application line.

- **Disposal of Substances:** Waste material disposals
  - Waste paints including QA/QC samples, spent wash solvent, 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, mis-tinted 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 products are shipped from the Facility to customers via outside transport companies.
    - Sulphuric Acid used in the manufacture of Catalyst formulations, but no chemical reactions are expected to occur during the manufacturing operations. All Sulphuric Acid used in these formulations is expected to be present in the final product.

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.

4.2 Manufacturing

4.2.1 Main Production & Stain Production Areas

Raw materials including the toxic substances are either pumped from the bulk, outdoor storage tanks or, manually added from small containers (drums, buckets, etc.) where other ingredients are added and mixed to specifications to one of the batch mixing tanks in the Main Production and Stain Production Areas.

4.2.2 Product Filling and Packaging

Finished products containing the toxic substances are transferred to drums, and other smaller packaging for sale to customers.

4.2.3 Solvent Washing Operations

The facility utilizes reclaimed solvent containing the toxic substances to wash tanks, lines and equipment contaminated with paints and stains when necessary.

4.3 Laboratories and Training Centre

Small quantities of materials containing the toxic substances are tested against customer specifications in the on-site laboratories and for training purposes in the new Training Centre paint booths and fume hoods.

4.4 Warehousing and storage of finished goods and shipping

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

4.4.1 Shipping of final product:

Products containing the toxic substances are shipped directly to the customer using an outside transportation 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 used in production during the year, the concentration of toxic substances in these materials as well as the releases of volatile toxic substances to air from the storage tanks.

Use of Toxic Substance: $\sum_x$ [Mass of Raw Material$_x$ x Mass Fraction (%) of Volatile Toxic Substance in Raw Material$_x$] + Tank Emission$_x$

Methodology: MASS

5.1.2 Storage Tanks

The release of volatile 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 an average data quality rating or "US EPA B".

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

5.1.3 Manufacturing

The release of the toxic substances from manufacturing operations is estimated based on the facilities internal Air Pollutant Emissions Module (APEM) / Batch Air Module which uses US EPA recommended Engineering Calculations with an average data quality to calculate airborne emissions from the various manufacturing operations. Emissions are calculated using the total quantity of materials used in the manufacturing processes and engineering principals (vapour pressure, operating times, etc.).

Release of Toxic Substance: Sherwin Williams APEM / Batch Air Module
Methodology: ENGCAL

5.1.4 Laboratories and Training Centre

The release of toxic substances from the spraying of materials in the Labs and the Training Centre on site are estimated using 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: Total Mass of Material Sprayed x Mass of Raw Material used in Manufacturing ÷ Total Mass of all Raw Materials used in Manufacturing x Mass Fraction (%) of Toxic Substance in Raw Material x 100% 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-specification materials for sale is estimated based on a mass balance around the quantity of this material transferred off site for sale and the fraction of the material that is composed of the toxic substance.

Transfer of Toxic Substance: Mass of Material Transferred x Mass fraction (%) of Toxic Substance in the Material
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 material that is composed of the toxic substance.

Transfer of Toxic Substance: Mass of Material Transferred x Mass fraction (%) of Toxic Substance in the Material
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 product produced, the concentration of toxic substances in the product specification, 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 Product Produced x Concentration of Toxic Substance in Product (%) – 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 & TRA Quantifications Spreadsheet*** is used to track and calculate the quantifications used in this plan. The methodologies employed in estimating the creation, destruction, 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 (2016) *NPRI & TRA Quantifications Spreadsheet*.

5.3 No Approximate Balance

Instances of No Approximate Balance of inputs and outputs of toxic substances quantified in this plan are caused by the uncertainties in the quantity of materials released to air and as waste materials.

In cases where a mass balance calculation around inputs, releases and disposals is employed to estimate the transfer of final products for sale, there will be no instances of No Approximate Balance of inputs and outputs.

A detailed accounting of these imbalances is included in the process flow diagram within the Process Flow Diagrams tab in the most recent (2016) *NPRI & TRA Quantifications Spreadsheet*.

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 **$11,832,180**.

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 cost associated with the use of the toxic substances is based on the costs associated with the purchase and use of raw materials containing these substances.
Table 6-1: Cost of Toxic Substance Use below provides the break-down of annual costs associated with the use of these toxic substances.

Table 6-1: Cost of Toxic Substance Use

Substance Name	Annual Cost of Use (CAD $)
Acetone	$1,197,000
2-Butoxyethanol	$120,000
n-Butyl Acetate	$4,400,000
i-Butyl Alcohol	$329,000
n-Butyl Alcohol	$1,060,000
Cobalt (and its compounds)	$300
Dibutyl Phthalate	$105,000
Ethyl Acetate	$563,000
Ethyl Alcohol	$1,734,000
Ethylbenzene	$28,000
Hexane	$53,000
Isopropyl Alcohol	$1,239,000
Methanol	$64,000
Methyl Ethyl Ketone	$211,000
Methyl Isobutyl Ketone	$91,000
Nonylphenol and its Ethoxylates	$9,000
Solvent naphtha light aliphatic	$246,000
Sulphuric acid	$32,000
Toluene	$170,000
1,2,4-Trimethylbenzene	$27,000
Xylene	$142,000

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 cost associated with the disposal of toxic substances is estimated based on the waste disposal costs and the relative proportions of toxic substances.

Table 6-2: Cost of Toxic Substance Disposal

Substance Name	Annual Cost of Use (CAD $)
Acetone	$1,150
2-Butoxyethanol	$120
n-Butyl Acetate	$4,110
n-Butyl Alcohol	$910
i-Butyl Alcohol	$320
Cobalt (and its compounds)	Negligible
Dibutyl Phthalate	$100
Ethyl Acetate	$530
Ethyl Alcohol	$1,110
Ethylbenzene	$110
Hexane	$50
Isopropyl Alcohol	$890

Substance Name	Annual Cost of Use (CAD $)
Methanol	$60
Methyl Ethyl Ketone	$200
Methyl Isobutyl Ketone	$90
Nonylphenol and its Ethoxylates	Negligible
Solvent naphtha light aliphatic	$240
Sulphuric Acid	$700
Toluene	$560
1,2,4-Trimethylbenzene	$20
Xylene	$610

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 net 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 with other comparable chemicals that are less toxic and will not compromise the quality or manufacturing cost of the finished product it is used in whenever possible.

7.2 Product Design or Reformulation

- Formulate all new products without Toxic Substances where possible.

7.3 Equipment or Process Modification

- 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.
- Investigate switching more chemicals to bulk containers for some chemicals to reduce residue disposed.
- Install fire rated air-open-spring-close type valves. In addition, we have already interlocked process tank valves with the fire alarm so that they automatically shut if a fire occurs.
- Review material handling and packaging to reduce product loss and spills of finished goods during filling.
- Blow back from filling heads into the mixer to recover material that can be recovered instead of disposed.

- 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.
- Return unused portion of the sample sent to the lab for testing to the batch instead of disposing in waste.
- Reduce the amount of samples taken for Quality Control testing from 1 quart to 1 half pint.

7.4 Spill and Leak Prevention

- Add locked caps on all valves to Spill Response Procedure.
- Conduct hose and transfer site inspections.

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).
- Reuse washings from whites in subsequent batches.
- Sell overstock, out-of-date stock, mis-tints to GDB.

7.6 Inventory Management

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

7.7 Training

- The following training programs / courses should be reviewed and updated to ensure consistency with the objectives of this Plan:
    - Containment Area Management and Inspection.
    - Unloading Tankers
    - Tank Farm Maintenance
    - Daily Checks
    - Spill Response and Contingency Plan
    - 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 Toxic Substances where possible.
  - Catalyst formulations cannot be reformulated without Sulphuric Acid or Cobalt as they are a necessary functional component.

8.2 Equipment or Process Modification

- Return unused portion of the sample sent to the lab for testing to the batch instead of disposing in waste.
- Reduce the amount of samples taken for Quality Control testing from 1 quart to 1 half pint.

8.3 Spill and Leak Prevention

- Add locked caps on all valves to Spill Response Procedure.
- Conduct hose and transfer site inspections.

8.4 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).
- Reuse washings from whites in subsequent batches.
- Sell overstock, out-of-date stock, mis-tints to GDB.

8.5 Inventory Management

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

8.6 Training

- The following training programs / courses should be reviewed and updated to ensure consistency with the objectives of this Plan:
  - Containment Area Management And Inspection
  - Unloading Tankers
  - Tank Farm Maintenance
  - Daily Checks
  - Spill Response and Contingency Plan
  - 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 Toxic Substances where possible.
  - Catalyst formulations cannot be reformulated without Sulphuric Acid or Cobalt as they are necessary functional components.

9.2 Equipment or Process Modification

- Return unused portion of the sample sent to the lab for testing to the batch instead of disposing in waste.
- Reduce the amount of samples taken for Quality Control testing from 1 quart to 1 half pint.

9.3 Spill and Leak Prevention

- 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).
- Reuse washings from whites in subsequent batches.
- Sell overstock, out-of-date stock, mis-tints to GDB.

9.5 Inventory Management

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

9.6 Training

- The following training programs / courses should be reviewed and updated to ensure consistency with the objectives of this Plan:
  - Containment Area Management And Inspection
  - Unloading Tankers
  - Tank Farm Maintenance
  - Daily Checks
  - Spill Response and Contingency Plan
  - Emergency and Evacuation Contingency Policy
  - Shipping & Receiving
  - Purchasing of Raw Materials
  - PLC Panel Operation
  - Batch making 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 Toxic Substances where possible.
  - **Implemented in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will result in the elimination of these toxic substances, with the exception of Sulphuric Acid and Cobalt, 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

- Reduce the amount of samples taken for Quality Control testing from 1 quart to 1 half pint.
  - **Implemented in 2013**
  - **Toxic Reduction Estimate:** Implementation of this option will result in a reduction in the quantity of toxic substances used as well as disposed of from the facility equal to the number of samples taken and the change in volume of the sample taken. However; this information is not currently tracked and no estimate of the toxic reduction is possible at this time.

- Return unused portion of the sample sent to the lab for testing to the batch instead of disposing in waste.
  - **Implemented in 2014**
  - **Toxic Reduction Estimate:** Implementation of this option will result in a reduction in the quantity of toxic substances used as well as disposed of from the facility equal to the number of samples taken. However; this information is not currently tracked and no estimate of the toxic reduction is possible at this time.

10.3 Spill and Leak Prevention

- Add locked caps on all valves to Spill Response Procedure.
  - **Implemented in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequently the use, releases and disposals of the toxic substances. However; as no released via spills were recorded no estimate of Toxic Reductions is possible.

- Conduct hose and transfer site inspections.
  - **Implemented 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).
  - **Implemented in 2013**
  - **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 international Inc.
  - **Implemented in 2012 and ongoing**
  - **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.

- Reuse washings from whites in subsequent batches
  - **Implemented in 2014**
  - **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 from white batches reused. This amount is currently unknown due to lack of data as this was not being tracked.

10.5 Inventory Management

- Reduce the amount of inventory stocked to eliminate product expiration.
  - **Implemented in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the use of toxic substances by eliminating waste. It is estimated that this will result in the reduction of Toxic substances being used on site and subsequently being disposes of. This amount is currently unknown due to lack of data as this was not being tracked.

- Conduct monthly audits of shelf life of finished goods. Rework product that his close to the end of its shelf life into new batches
  - **Implemented in 2014**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the use of toxic substances by eliminating waste. It is estimated that this will result in the reduction of toxic substances being used on site and subsequently being disposed of. This amount is currently unknown due to lack of data as this was not being tracked.

10.6 Training and Improved Operating Practices

- Containment Area Management and Inspection.
  - **Completed in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequently the use, releases and disposals of the toxic substances. However, as no releases via spills were recorded no estimate of Toxic Reductions is possible.

- Unloading Tankers
  - **Completed in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequently the use, releases and disposals of the toxic substances. However, as no releases via spills were recorded no estimate of Toxic Reductions is possible.

- Tank Farm Maintenance
  - **Completed in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequently the use, releases and disposals of the toxic substances. However, as no releases via spills were recorded no estimate of Toxic Reductions is possible.

- Daily Checks
  - **Completed in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequently the use, releases and disposals of the toxic substances. However, as no releases via spills were recorded no estimate of Toxic Reductions is possible.

- Spill Response and Contingency Plan
  - **Completed in 2012 and ongoing**
  - **Toxic Reduction Estimate:** Implementation of this option will reduce the risks of spills and subsequently the use, releases and disposals of the toxic substances. However, as no releases 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 subsequently the use, releases and disposals of the toxic substances. However, as no releases 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. However, this quantity 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. However, this quantity 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.

2. The facility should consider tracking data on the following:
   a. use and recycling of wash solvent
   b. use of wash solvent for white batches
   c. quantities of sample materials collected for QA/QC purposes

   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

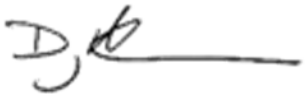
This Toxic Substance Reduction Plan Summary accurately reflects the current version of the Toxic Substance Reduction Plan.

As of _____ (Date), I Dave MacDonald, 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.

_____ _____

Dave MacDonald, Plant Manager Date

As of September 25st, 2017, I Douglas McLaren, certify that I am familiar with the processes at the Sherwin Williams Fort Erie 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 December 15th, 2014 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under the Act.



_____ __September 25th, 2017____

Douglas McLaren, P.Eng. Toxic Substance Reduction Planner Date

Substance Name	Chemical Abstracts Service (CAS) Number
Acetone	67-64-1
2-Butoxyethanol	111-76-2
n-Butyl Acetate	123-86-4
i-Butyl Alcohol	78-83-1
n-Butyl Alcohol	71-36-3
Cobalt (and its compounds)	N/A
Dibutyl Phthalate	84-74-2
Ethyl Acetate	141-78-6
Ethyl Alcohol	64-17-5
Ethylbenzene	100-41-4
Hexane	110-54-3
Isopropyl Alcohol	67-63-0
Methanol	67-56-1
Methyl Ethyl Ketone	78-93-3
Methyl Isobutyl Ketone	108-10-1
Nonylphenol and its Ethoxylates	N/A
Solvent naphtha light aliphatic	64742-89-8
Sulphuric Acid	7664-93-9
Toluene	108-88-3
1,2,4-Trimethylbenzene	95-63-6
Xylene, Total	1330-20-7

ATTACHMENT 1

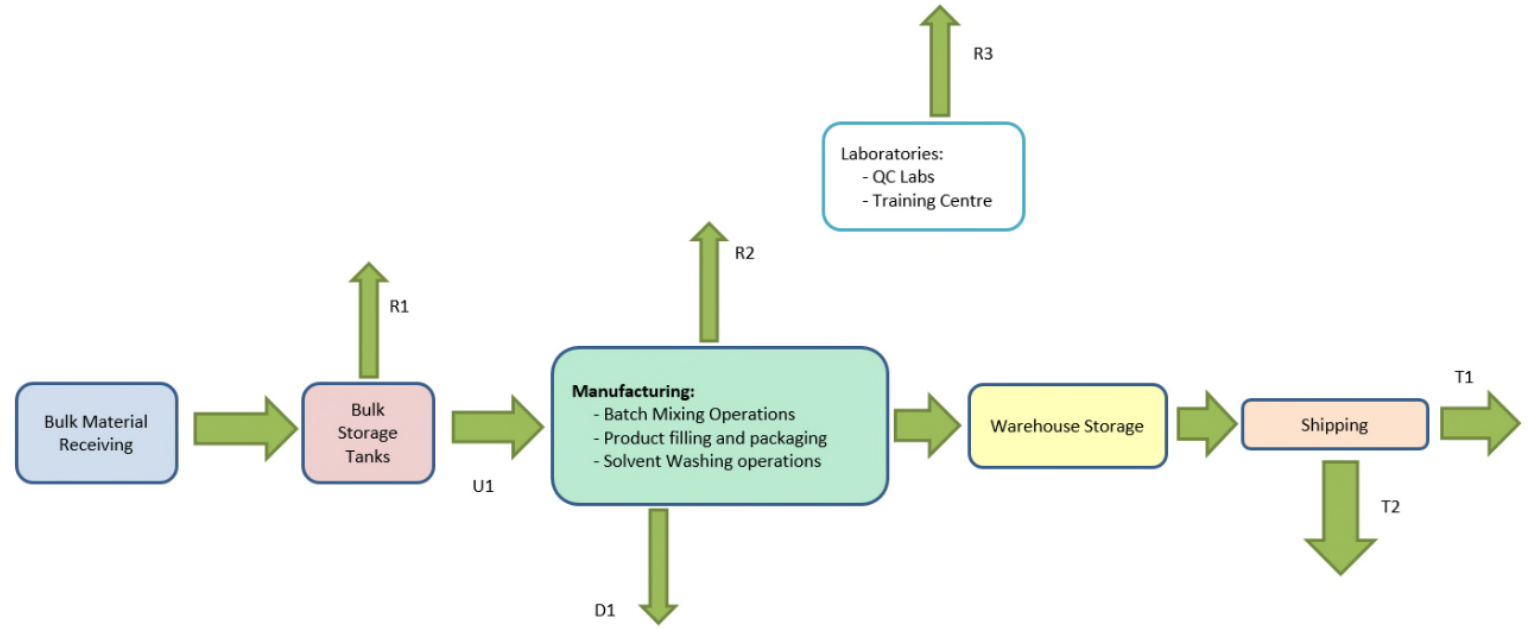
Process Flow Diagram

Sherwin Williams Canada Inc.

Fort Erie Facility

Process Flow Diagram

Facility Wide Tracking of Reportable Toxic Substances - 2017 TRA Plan Updates



TETRA TECH

2016 Reporting Year																		
U1 - Material	77,435	kg Ethylbenzene	692,061	kg Acetone	611,052	kg n-Butyl Alcohol	42,927	kg Dibutyl Phthalate	69,735	kg 2-Butoxyethanol	386,712	kg Ethyl Acetate	66,081	kg Hexane
	419,918	kg Toluene	60,080	kg Methanol		kg i-Butyl Alcohol	13,561	kg 1,2,4-Trimethylbenzene	914,063	kg Ethyl Alcohol	359,639	kg Solvent naphtha	260	kg Cobalt
	457,810	kg Xylene	668,819	kg Isopropyl Alcohol	157,609	kg Methyl Ethyl Ketone	65,875	kg Methyl Isobutyl Ketone	2,343,794	kg n-Butyl Acetate	17,380	kg Sulphuric Acid	1,817	kg NPE
R1 - Tank Emissions	3	kg Ethylbenzene	476	kg Acetone	9	kg n-Butyl Alcohol		kg Dibutyl Phthalate	0	kg 2-Butoxyethanol	133	kg Ethyl Acetate	0	kg Hexane
	27	kg Toluene	18	kg Methanol		kg i-Butyl Alcohol	1	kg 1,2,4-Trimethylbenzene	188	kg Ethyl Alcohol	15	kg Solvent naphtha		kg Cobalt
	16	kg Xylene	70	kg Isopropyl Alcohol	62	kg Methyl Ethyl Ketone	12	kg Methyl Isobutyl Ketone	191	kg n-Butyl Acetate		kg Sulphuric Acid		kg NPE
R2 - Manufacturing Emissions	257	kg Ethylbenzene	36,420	kg Acetone	899	kg n-Butyl Alcohol		kg Dibutyl Phthalate	8	kg 2-Butoxyethanol	5,353	kg Ethyl Acetate	7,504	kg Hexane
	5,179	kg Toluene	868	kg Methanol		kg i-Butyl Alcohol	18	kg 1,2,4-Trimethylbenzene	8,655	kg Ethyl Alcohol	3,649	kg Solvent naphtha		kg Cobalt
	1,251	kg Xylene	6,291	kg Isopropyl Alcohol	3,927	kg Methyl Ethyl Ketone	431	kg Methyl Isobutyl Ketone	9,522	kg n-Butyl Acetate		kg Sulphuric Acid		kg NPE
R3 - Laboratory Emissions	5	kg Ethylbenzene	45	kg Acetone	35	kg n-Butyl Alcohol		kg Dibutyl Phthalate	4	kg 2-Butoxyethanol	25	kg Ethyl Acetate	4	kg Hexane
	21	kg Toluene	3	kg Methanol		kg i-Butyl Alcohol	1	kg 1,2,4-Trimethylbenzene	36	kg Ethyl Alcohol	20	kg Solvent naphtha		kg Cobalt
	26	kg Xylene	32	kg Isopropyl Alcohol	10	kg Methyl Ethyl Ketone	4	kg Methyl Isobutyl Ketone	148	kg n-Butyl Acetate		kg Sulphuric Acid		kg NPE
D1 - Disposal of Waste	642	kg Ethylbenzene	1,407	kg Acetone	964	kg n-Butyl Alcohol	52	kg Dibutyl Phthalate	361	kg 2-Butoxyethanol		kg Ethyl Acetate	62	kg Hexane
	3,480	kg Toluene	1,195	kg Methanol		kg i-Butyl Alcohol	138	kg 1,2,4-Trimethylbenzene		kg Ethyl Alcohol		kg Solvent naphtha	0.2	kg Cobalt
	3,637	kg Xylene	1,142	kg Isopropyl Alcohol	1,952	kg Methyl Ethyl Ketone	248	kg Methyl Isobutyl Ketone		kg n-Butyl Acetate	21	kg Sulphuric Acid	73	kg NPE
T1 - Transfer of Product	76,528	kg Ethylbenzene	653,712	kg Acetone	609,146	kg n-Butyl Alcohol	42,875	kg Dibutyl Phthalate	69,362	kg 2-Butoxyethanol	381,201	kg Ethyl Acetate	58,494	kg Hexane
	411,211	kg Toluene	57,996	kg Methanol		kg i-Butyl Alcohol	13,403	kg 1,2,4-Trimethylbenzene	905,184	kg Ethyl Alcohol	355,954	kg Solvent naphtha	260	kg Cobalt
	452,879	kg Xylene	661,284	kg Isopropyl Alcohol	151,659	kg Methyl Ethyl Ketone	65,179	kg Methyl Isobutyl Ketone	2,333,933	kg n-Butyl Acetate	17,359	kg Sulphuric Acid	1,744	kg NPE
T2 - Transfer of Off-Spec Product	568	kg Ethylbenzene	754	kg Acetone	394	kg n-Butyl Alcohol	12	kg Dibutyl Phthalate	17	kg 2-Butoxyethanol	0	kg Ethyl Acetate	18	kg Hexane
	3,103	kg Toluene	423	kg Methanol		kg i-Butyl Alcohol	114	kg 1,2,4-Trimethylbenzene	0	kg Ethyl Alcohol	0	kg Solvent naphtha	0.1	kg Cobalt
	3,225	kg Xylene	517	kg Isopropyl Alcohol	1,812	kg Methyl Ethyl Ketone	186	kg Methyl Isobutyl Ketone	0	kg n-Butyl Acetate	5	kg Sulphuric Acid	0	kg NPE
Approximate Balance Calculation														
Material Inputs - Outputs	-568	kg Ethylbenzene	-754	kg Acetone	-394	kg n-Butyl Alcohol	-12	kg Dibutyl Phthalate	-17	kg 2-Butoxyethanol	0	kg Ethyl Acetate	0	kg Hexane
(Use - Releases - Disposals - Products)	-3,103	kg Toluene	-423	kg Methanol	0	kg i-Butyl Alcohol	-114	kg 1,2,4-Trimethylbenzene	0	kg Ethyl Alcohol	0	kg Solvent naphtha	0	kg Cobalt
	-3,225	kg Xylene	-517	kg Isopropyl Alcohol	-1,812	kg Methyl Ethyl Ketone	-186	kg Methyl Isobutyl Ketone	0	kg n-Butyl Acetate	-5	kg Sulphuric Acid	0	kg NPE
Material Inputs - Outputs	-1%	kg Ethylbenzene	0%	kg Acetone	0%	kg n-Butyl Alcohol	0%	kg Dibutyl Phthalate	0%	kg 2-Butoxyethanol	0%	kg Ethyl Acetate	0%	kg Hexane
(% Unaccounted For relative to Use)	-1%	kg Toluene	-1%	kg Methanol		kg i-Butyl Alcohol	-1%	kg 1,2,4-Trimethylbenzene	0%	kg Ethyl Alcohol	0%	kg Solvent naphtha	0%	kg Cobalt
	-1%	kg Xylene	0%	kg Isopropyl Alcohol	-1%	kg Methyl Ethyl Ketone	0%	kg Methyl Isobutyl Ketone	0%	kg n-Butyl Acetate	0%	kg Sulphuric Acid	0%	kg NPE

ATTACHMENT 2

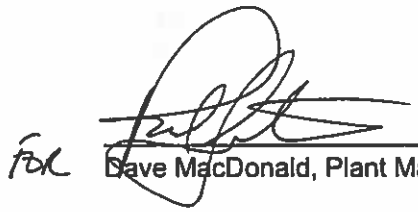
NPRI & TRA Quantifications Spreadsheet

USB Included

12.0 CERTIFICATIONS

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

As of DECEMBER 19, 2017 (Date), I Dave MacDonald, 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.



FOR Dave MacDonald, Plant Manager — 12/19/2017 Date

As of December 18th, 2017, I Douglas McLaren, certify that I am familiar with the processes at the Sherwin Williams Fort Erie 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 December 15th, 2014 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 18th, 2017 Date

Substance Name	Chemical Abstracts Service (CAS) Number
Acetone	67-64-1
2-Butoxyethanol	111-76-2
n-Butyl Acetate	123-86-4
i-Butyl Alcohol	78-83-1
n-Butyl Alcohol	71-36-3
Cobalt (and its compounds)	N/A
Dibutyl Phthalate	84-74-2
Ethyl Acetate	141-78-6
Ethyl Alcohol	64-17-5
Ethylbenzene	100-41-4

Substance Name	Chemical Abstracts Service (CAS) Number
Hexane	110-54-3
Isopropyl Alcohol	67-63-0
Methanol	67-56-1
Methyl Ethyl Ketone	78-93-3
Methyl Isobutyl Ketone	108-10-1
Nonylphenol and its Ethoxylates	N/A
Solvent naphtha light aliphatic	64742-89-8
Sulphuric Acid	7664-93-9
Toluene	108-88-3
1,2,4-Trimethylbenzene	95-63-6
Xylene, Total	1330-20-7