

GfSA TRA Annual Summary

Comparison 2014-2015

Facility Information

Company Name: Greenfield Specialty Alcohols Inc.
Chatham Plant

Facility Address: 275 Bloomfield Dr.
Chatham, Ontario
N7M 5J5

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Plant Manager
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Parent Company: Greenfield Specialty Alcohols Inc.
100% Ownership

UTM Coordinates: Zone 17
UTM Easting 393453; UTM Northing 4693216

Facility NPRI ID: 5739

In 2015, GfSA Chatham Facility employed 70 full time employees

NAICS Codes: Two Digit NAICS – 31, 32
Four Digit NAICS - 3121, 3251

Six Digit NAICS - 312140, 325190

Reduction Objectives:

Greenfield Specialty Alcohols Inc. (GFSA) operates an ethanol production facility. GFSA is committed to protect the environment through continual improvement of its manufacturing processes and the prevention of pollution. The objective of GFSA is to determine the technical and economic feasibility of various reduction options and identify if any are viable for implementation.

Toxic Substances:

The TRA requires the tracking of the following NPRI substances: Acetaldehyde, Cumene, Cyclohexane, Ethylbenzene, Methanol, Sulphuric Acid, Ammonia, Carbon Monoxide, Ethanol, Ethyl Acetate, Isopropyl Alcohol, Nitrogen Oxides, PM 2.5, PM 10, Toluene, Benzene and n-Hexane.

Tracking and Quantifications:

The method used to calculate the TRA quantifications was a mass balance approach.

Table 1 provides a summary of the facility TRA steps taken in 2015.

Table 2 provides a summary of the TRA quantities for the 2015 operational year compared to the last reported values.

TOXIC REDUCTION ACT- Reduction Potential - Phase 1 & 2 - SUMMARY FOR 2015

TOXIC SUBSTANCES	Source	1. Material or process substitution	2. Product design or reformulation	3. Equipment or process modification	4. Spill and leak prevention	5. On-site reuse or recycling	6. Improved inventory management or purchasing techniques	7. Training or improved operating practices	Reduction Targets	Timeline/Steps Taken	Agreements to date	Additional reduction actions
Acetaldehyde [APD]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process.	Not applicable - this is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	1% reduction	On Schedule	N/A	N/A
Ammonia [APD]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process. New enzymes were added to help with the breakdown of the material being used. The result was a reduction in ammonia levels.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	10% reduction	On Schedule	N/A	N/A
Benzene, toluene, ethylbenzene, xylene [BTX]	Purchased in bulk, received in quantities which is used to denature ethanol product.	Not applicable. This is a by-product of our process.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	10% reduction	On Schedule	N/A	N/A
Formaldehyde [FAL]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	10% reduction	On Schedule	N/A	N/A
CO, NOx [CO]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	13% reduction in COx	On Schedule	N/A	N/A
Ethanol [spicable VOC]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	N/A	N/A	N/A	N/A
Hexane, n-Hexane, Pentane, Propane [spicable VOC]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	N/A	N/A	N/A	N/A
Methanol [spicable VOC]	Generated in process in low pH control. 2. Losses are mainly attributed to product of fermentation and dries.	Not applicable. This is a by-product of our process.	Not applicable. This is a by-product of our process. Chemical consumption was up due to process upsets.	New Cogen was added to ensure consistent electrical efficiency between the two plants. This in turn decreases oxidizability vented in our stack. The result was a reduction of 59% in acetaldehyde emissions.	Driver door inspections, leak checks and pressure readings help minimize leakage.	Not applicable	Not applicable	Maintenance and operators are taught to detect, reports and repair leaks whenever possible.	N/A	N/A	N/A	N/A

Measure of Reduction

Table 2: Toxic Reduction Act - Phase 1 & 2 - 2015 Quantities

Phase 1		TOXIC SUBSTANCES - Phase 1 & 2																			
Substance	Source	2015 Used (tonnes)	2014 Used - Last reported value	% Change	2015 Created (tonnes)	2014 Created - Last reported value	% Change	2015 Contained in Product - Last Reported Value	2014 Contained in Product - Last Reported Value	% Change	2015 Released to Air (tonnes)	2014 Released to Air - Last Reported	% Change	Quantity Released to Surface Waters	Quantity Released to Land	Quantity Disposed of on-site to Land	Quantity Transferred off-site for Disposal	Quantity Transferred off-site for Treatment	Quantity Transferred off-site for Recycling	Reason for Change	
Acetaldehyde (MFO) CAS#: 75-07-0	Generated in process in low concentration at evaporation, fermentation and dryers.	0	>10-100	6.80%	0	>10-100	6.80%	>10-100	>10-100	-3.13%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Emissions and odour testing updated in 2015. Due to dryer optimization there was no acetaldehyde vented in our stack.
Benzene CAS#: 71-43-2	In gasoline which is used to denature ethanol product.	0	>10-100	6.80%	0	>10-100	6.80%	>10-100	>10-100	-3.13%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	This is currently part of our denaturing process as per Excise Canada.
Methanol CAS#: 67-56-1	Utilized as denaturant following Excise Canada plant site in 55 tank.	0	>10-100	25.29%	0	>10-100	25.29%	>100-1000	>100-1000	-14.08%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Decrease in production process usage due to process upsets.
Sulphuric Acid CAS#: 7664-93-9	Purchased in bulk, received and stored on plant site in 55 tank. Neutralized / neutralized balance with truck during upon mixing in to process.	0	>10-100	31.39%	0	>10-100	31.39%	>100-1000	>100-1000	-1.94%	0	>1-10	>1-10	>100-1000	0	0	0	0	0	0	Increased usage due to Reduction in creation in process upsets.
Ammonia CAS#: NA-16	1. Purchased in bulk, used for pH control. Neutralized/converted upon mixing in to process.	0	>10-100	65.70%	0	>10-100	65.70%	>100-1000	>100-1000	-1.94%	0	>1-10	>1-10	>100-1000	0	0	0	0	0	0	Increased usage due to process upsets.
PM2.5 CAS#: NA-M10	Created at grain unloading and milling, the corn and milling, the corn vents, grain transfers, cooling towers and boiler stack.	0	>10-100	0.00%	0	>10-100	0.00%	>100-1000	>100-1000	-45.49%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Improved efficiency.
PM10 CAS#: NA-M09	Created at grain unloading and milling, the corn and milling, the corn vents, grain transfers, cooling towers and boiler stack.	0	>10-100	0.00%	0	>10-100	0.00%	>100-1000	>100-1000	-45.49%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Improved efficiency.
Total Particulate Matter CAS#: NA-M08	Created at grain unloading and milling, the corn and milling, the corn vents, grain transfers, cooling towers and boiler stack.	0	>10-100	0.00%	0	>10-100	0.00%	>100-1000	>100-1000	-45.49%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Improved efficiency.
Nox CAS#: 11104-93-1	Products of NG combustion. Mainly: Turbine, Boilers, Dryers, Minimally: Building Space Heaters, diesel Five Pump and operation of Tanker Trucks, Rail Engines, other Vehicle traffic	0	>10-100	0.00%	0	>10-100	0.00%	>100-1000	>100-1000	0.00%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Increased NG usage with new COGEN but will decrease electricity generation.
CO CAS#: 630-08-0	Products of NG combustion. Mainly: Turbine, Boilers, Dryers, Minimally: Building Space Heaters, diesel Five Pump and operation of Tanker Trucks, Rail Engines, other Vehicle traffic	0	>10-100	6.80%	0	>10-100	6.80%	>100-1000	>100-1000	6.82%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Improved combustion efficiency.
Cycohexane CAS#: 110-82-7	In gasoline which is used to denature ethanol product.	0	>10-100	6.80%	0	>10-100	6.80%	>100-1000	>100-1000	6.82%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Improved combustion efficiency.
Toluene CAS#: 108-88-3	In gasoline which is used to denature ethanol product.	0	>10-100	6.80%	0	>10-100	6.80%	>100-1000	>100-1000	6.82%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	Improved combustion efficiency.
Ethylbenzene CAS#: 100-41-4	Corrosion inhibitor added to gasoline which is used to denature ethanol product.	0	>10-100	3.85%	0	>10-100	3.85%	>100-1000	>100-1000	0.00%	0	>10-100	>10-100	>100-1000	0	0	0	0	0	0	This is currently part of our denaturing process as per Excise Canada.
Ethyl acetate CAS#: 141-76-6	Raw material delivered by Excise Canada denaturant following requirements.	0	>10-100	4.60%	0	>10-100	4.60%	>100-1000	>100-1000	0.00%	0	>1-10	>1-10	>100-1000	0	0	0	0	0	0	This is currently part of our denaturing process as per Excise Canada.
Xylene CAS#: 1390-20-7	Excise Canada denaturant following requirements.	0	>10-100	4.60%	0	>10-100	4.60%	>100-1000	>100-1000	0.00%	0	>1-10	>1-10	>100-1000	0	0	0	0	0	0	This is currently part of our denaturing process as per Excise Canada.
n-Hexane CAS#: 110-54-3	5-13 Dryer Stack and boiler and turbine stacks.	0	>10-100	0.00%	0	>10-100	0.00%	>100-1000	>100-1000	-70.77%	0	>1-10	>1-10	>100-1000	0	0	0	0	0	0	Improved combustion efficiency.
Ethanol CAS#: 64-17-5	Generated in final production process.	0	>10-100	0.00%	0	>10-100	0.00%	>100-1000	>100-1000	-70.77%	0	>1-10	>1-10	>100-1000	0	0	0	0	0	0	In 2015 we added a new product line with another ethanol wet scrubber. The end result was lower 2015 emissions reported in the emissions testing.