



DEXTRAN PRODUCTS LIMITED

(A DIVISION OF POLYDEX PHARMACEUTICALS LIMITED)

421 - 423 Comstock Road
Scarborough, Ontario, Canada
M1L 2H5

Tel: 416-755-2231

Fax: 416-755-0334

www.dextran.ca

Dextran Products Limited: Toxic Substance Reduction Plan Summary, 2011

A. Basic Facility Information

Name and CAS# of Substance: **Cyanides, Ionic. CAS N/A**

Substances for which other plans have been prepared:

Hydrochloric Acid CAS# 7647-01-0

Methanol CAS# 67-56-1

Facility Identification and Site Address

Company Name: Dextran Products Limited

Facility Name: Dextran Products Limited

Facility Address: 421 Comstock Road, Toronto, Ontario. M1L 2H5. Canada.

UTM Spatial Coordinates: Latitude: 43.72324N

Longitude: 79.27715W

Number of Full-time Employees: 21

National Pollutant Release Inventory identification number: 000577

MOE ID Number: N/A

Business Number: 88514 1861 RT 0001

Parent Company Information

Name and address: Polydex Chemicals (Canada) Limited, 421 Comstock Road, Toronto, Ontario, M1L 2H5

Percent Ownership: 100%

Primary North American Industrial Classification System Code (NAICS)

Sector 31:Manufacturing

NAICS Code; 32541, Establishments primarily engaged in one or more of the following: (1) manufacturing biological and medicinal products: (2) processing (i.e. grading, grinding and milling) botanical drugs and herbs: (3) isolating active medicinal principals from botanical drugs and herbs: and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms such as ampoules, tablets, capsules, vials, ointments, powders, solutions and suspensions

Two Digit NAICS Code: 32

Four Digit NAICS Code: 3254

Five Digit NAICS Code: 32541

Company Contact Information

Operator of the Facility:

George Usher, c/o Dextran Products Limited, 421 Comstock Road, Toronto, Ontario, M1L 2H5

Telephone: 416-755-2231

Fax number: 416-755-0334

Email: gu-dextran@rogers.com

Parent Company Contact Information

Parent Company Contact: N/A

Plan Summary Statement

This plan summary accurately reflects the content of the toxic substance reduction plan for Cyanides, Ionic, prepared by Dextran Products Ltd, dated December 17th, 2012.

Statement of Intent

Dextran Products Ltd. is committed to playing a pro-active role in protecting the environment and also health and safety of its employees and people surrounding the plant. Whenever or wherever feasible in our operations and processes, we will reduce or eliminate the use and/or discharge of toxic compounds in full compliance with Federal and Provincial Regulations, this facility does not create toxic compounds and so this plan will not address reducing the creation of such.

Reduction Objectives

Dextran Products Ltd. intends to monitor new methods and investigate ways to reduce the use of Potassium Cyanide by 5% within the next 6 years of preparing this Plan.

We are, however, somewhat regulated by our customers and Health Canada and the United States Food and Drug Administration in what we can do as we manufacture Active Pharmaceutical Ingredients.

Description of Substance

Cyanides, Ionic

Ionic Cyanide (CN⁻) in the form of Potassium Cyanide is added to solutions of Dextran as a manufacturing aid (reactant) to increase its reactivity and ability to bind with Iron Salts to form Iron Dextran. In the process, the Potassium is released, the Carbon joins onto the Dextran molecule and the Nitrogen forms Ammonia. This process was established in about 1969 and has now been registered by companies in many countries around the world. We have also established a worldwide reputation of producing a high quality product and are now one of two producers in the world.

In 2011, the company purchased the equivalent of 3,600 kilos of Ionic Cyanide.

Options to be implemented:

If available, we will purchase smaller containers thereby using less material.

OPTION: Improved Inventory Management of Purchasing Techniques: Purchase of smaller containers enable us to more accurately dose the process.

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	3600	0	0	0	0	0	0	0	0
New Estimated Amount	3420	0	0	0	0	0	0	0	0
Reduction	180	0	0	0	0	0	0	0	0
%Reduction	5	0	0	0	0	0	0	0	0

These savings could amount to $\$8.74 \times 450 = \$3,933$ per year.

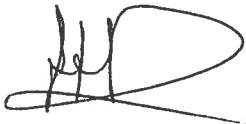
(Savings based on the unit cost of the raw material)

1. Certification

1.1 Certifications - Highest Ranking Employee

As of December 19, 2012, I, George USHER, certify that I have read the toxic substance reduction plan for the toxic substance 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.

(Ionic Cyanides)



George Usher, President

Tel. No.: 416-755-2231

Email: gu-dextran@rogers.com

1.2 Certification by toxic substance reduction planner

As of December 27, 2012, I, Ravi Sharma certify that I am familiar with the processes at Dextran Products Limited 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 27, 2012 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

(Ionic Cyanides)



Ravi Sharma, M.Sc., M. Eng., C.Chem.
Project Manager
ETCOS Inv. Environmental
Planner License No. TSRP0250
Email: etcosca@gmail.com

Dextran Products Limited: Toxic Substance Reduction Plan Summary, 2011

A. Basic Facility Information

Name and CAS# of Substance: **Hydrochloric Acid CAS# 7647-01-0**

Substances for which other plans have been prepared:

Cyanides, Ionic. CAS N/A

Methanol CAS# 67-56-1

Facility Identification and Site Address

Company Name: Dextran Products Limited

Facility Name: Dextran Products Limited

Facility Address: 421 Comstock Road, Toronto, Ontario. M1L 2H5. Canada.

UTM Spatial Coordinates: Latitude: 43.72324N

Longitude: 79.27715W

Number of Full-time Employees: 21

National Pollutant Release Inventory identification number: 000577

MOE ID Number: N/A

Business Number: 88514 1861 RT 0001

Parent Company Information

Name and address: Polydex Chemicals (Canada) Limited, 421 Comstock Road, Toronto, Ontario, M1L 2H5

Percent Ownership: 100%

Primary North American Industrial Classification System Code (NAICS)

Sector 31:Manufacturing

NAICS Code; 32541, Establishments primarily engaged in one or more of the following: (1) manufacturing biological and medicinal products: (2) processing (i.e. grading, grinding and milling) botanical drugs and herbs: (3) isolating active medicinal principals from botanical drugs and herbs: and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms such as ampoules, tablets, capsules, vials, ointments, powders, solutions and suspensions

Two Digit NAICS Code: 32

Four Digit NAICS Code: 3254

Five Digit NAICS Code: 32541

Company Contact Information

Operator of the Facility:

George Usher, c/o Dextran Products Limited, 421 Comstock Road, Toronto, Ontario, M1L 2H5

Telephone: 416-755-2231

Fax number: 416-755-0334

Email: gu-dextran@rogers.com

Parent Company Contact Information

Parent Company Contact: N/A

Plan Summary Statement

This plan summary accurately reflects the content of the toxic substance reduction plan for Hydrochloric Acid, prepared by Dextran Products Ltd, dated December 17th, 2012.

Statement of Intent

Dextran Products Ltd. is committed to playing a pro-active role in protecting the environment and also health and safety of its employees and people surrounding the plant. Whenever or wherever feasible in our operations and processes, we will reduce or eliminate the use and/or discharge of toxic compounds in full compliance with Federal and Provincial Regulations, this facility does not create toxic compounds and so this plan will not address reducing the creation of such.

Reduction Objectives

Dextran Products Ltd. intends to monitor new methods and investigate ways to reduce the use of Hydrochloric Acid in all of its applications. It is hoped that the total use can be reduced by 5% within the next 5 years of preparing this Plan.

We are, however, somewhat regulated by our customers and Health Canada and the United States Food and Drug Administration in what we can do as we manufacture Active Pharmaceutical Ingredients.

Description of Substance

Hydrochloric Acid 7647-01-0

Plan

Hydrochloric Acid is used as a hydrolysis agent in the production of Dextran, as a Cleaning Agent for our Ferric Hydroxide Ultrafiltration Units and to regenerate our Resin Column.

In 2011, the company purchased 213, 938 kilos of Hydrochloric Acid for all uses. It is a 30° Baume concentration product.

Options to be implemented.

A new production method for Dextran will be investigated. This will require personnel time for research and development. Costs cannot be accurately estimated at this time as we are unsure of the research involved and the possible progress. Based on current knowledge our best estimate is one full time employee for about one year or perhaps \$75,000. The outcome is not guaranteed.

OPTION: Process Modification: New process to make Dextran.

Assumption: We produce one to two batches per week for 46 weeks for a total of 69 batches per year. At a consumption of 260 liters per batch this amounts to about 18,000 kilos per year

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	18,000	0	0	0	0	0	0	0	0
New Estimated Amount	15,000	0	0	0	0	0	0	0	0
Reduction	3,000	0	0	0	0	0	0	0	0
%Reduction	16%	0	0	0	0	0	0	0	0

Savings: $3,000 \times \$0.36 = \$1,080$ per year.

Manufacturing Operation: Cleaning of Ultrafiltration Systems

Options to be implemented

OPTION: Equipment/Process Modification: We will immediately investigate using 10 liters less per cleaning. This would immediately reduce consumption by 110 liters x 46 x 7 days = 35,420 or 3220 liters from the present system.

Assumption: Present procedure: Three systems running, 46 weeks of the year, 7 days per week, one washed per day = 120 liters x 46 weeks x 7 days = 38,640

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	38,640	0	0	0	0	0	0	0	0
New Estimated Amount	35,420	0	0	0	0	0	0	0	0
Reduction	3,220	0	0	0	0	0	0	0	0
%Reduction	8%	0	0	0	0	0	0	0	0

Savings: 3,220 x \$0.36 = \$1,160 per year

OPTION: Equipment/Process modification: Work will restart on a new process to make Iron Dextran 20% in conjunction with our customers.

Assumption: Three systems running, 46 weeks of the year, 7 days per week, one washed per day.

120 liters x 46 weeks x 7 days = 38,640

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	38,640	0	0	0	0	0	0	0	0
New Estimated Amount	30,000	0	0	0	0	0	0	0	0
Reduction	8,640	0	0	0	0	0	0	0	0
%Reduction	29%	0	0	0	0	0	0	0	0

Savings: 8,640 x \$0.36 = \$3,110 per year.

Manufacturing Operation: Regeneration of Resin Columns

Options to be implemented

OPTION: Equipment/Process Modification: We are in active discussions with the customer to see if we can secure their unit. Costs are unknown at this time as to the cost of the unit, if any, and running costs.

46 weeks x 2.5 batches per week x 4 deionizations = 115,000

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	115,000	0	0	0	0	0	0	0	0
New Estimated Amount	0	0	0	0	0	0	0	0	0
Reduction	115,000	0	0	0	0	0	0	0	0
%Reduction	100%	0	0	0	0	0	0	0	0

NOTE: This will only occur if the new unit can be secured, is proven to work and does not require acid for cleaning. This is possible but cannot be confirmed at this time.

Savings: $115,000 \times \$0.35 = \$40,250$ per year.

There would also be savings in the purchase of Caustic Soda. These would amount to 115,000 liters at a cost of about \$112,700 per year.

The new unit cost would be in the range of \$300,000 to \$400,000

Manufacturing Operation: Regeneration of Water Resin Columns

Analysis of Options For Technically Feasible options.

We have requested a quote from a company to create a new water system. It is expected they will supply utility consumption with the quote so we can balance the new unit against the existing unit.

Options to be implemented

OPTION: Equipment/Process Modification: A decision can be made once we have the information on the new unit.

Assumption: 46 weeks x 7 days x 1 regenerations per day x 160 liters =

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	51,520	0	0	0	0	0	0	0	0
New Estimated Amount	0	0	0	0	0	0	0	0	0
Reduction	51,520	0	0	0	0	0	0	0	0
%Reduction	100%	0	0	0	0	0	0	0	0

NOTE: This will only be possible if a new unit is found and can run economically.

Savings: 51,520 x \$0.35 = \$18,032 per year.

There would also be savings in the purchase of Caustic Soda. These would amount to 51,520 liters at a cost of about \$50,490 per year.

The cost of the new unit could be in the range of \$300,000 to \$400,000.

Note: This will only be possible if a new unit is found and can run economically.

1 Certification

1.2 Certifications - Highest Ranking Employee

As of December 19, 2012, I, George USHER, certify that I have read the toxic substance reduction plan for the toxic substance 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.

(Hydrochloric acid)



George Usher, President

Tel. No.: 416-755-2231

Email: gu-dextran@rogers.com

1.3 Certification by toxic substance reduction planner

As of December 27, 2012, I, Ravi Sharma certify that I am familiar with the processes at Dextran Products Limited 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 27, 2012 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

(Hydrochloric acid)



Ravi Sharma, M.Sc., M. Eng., C.Chem.
Project Manager
ETCOS Inv. Environmental
Planner License No. TSRP0250
Email: etcosca@gmail.com

Primary North American Industrial Classification System Code (NAICS)

Sector 31:Manufacturing

NAICS Code; 32541, Establishments primarily engaged in one or more of the following: (1) manufacturing biological and medicinal products: (2) processing (i.e. grading, grinding and milling) botanical drugs and herbs: (3) isolating active medicinal principals from botanical drugs and herbs: and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms such as ampoules, tablets, capsules, vials, ointments, powders, solutions and suspensions

Two Digit NAICS Code: 32

Four Digit NAICS Code: 3254

Five Digit NAICS Code: 32541

Company Contact Information

Operator of the Facility:

George Usher, c/o Dextran Products Limited, 421 Comstock Road, Toronto, Ontario, M1L 2H5

Telephone: 416-755-2231

Fax number: 416-755-0334

Email: gu-dextran@rogers.com

Parent Company Contact Information

Parent Company Contact: N/A

Plan Summary Statement

This plan summary accurately reflects the content of the toxic substance reduction plan for Methanol, prepared by Dextran Products Ltd, dated December 17th, 2012.

Statement of Intent

Dextran Products Ltd. is committed to playing a pro-active role in protecting the environment and also health and safety of its employees and people surrounding the plant. Whenever or wherever feasible in our operations and processes, we will reduce or eliminate the use and/or discharge of toxic compounds in full compliance with Federal and Provincial Regulations, this facility does not create toxic compounds and so this plan will not address reducing the creation of such.

Reduction Objectives

Dextran Products Ltd. intends to monitor new methods and investigate ways to reduce the use of Methanol by 5% within the next 6 years of preparing this Plan.

We are, however, somewhat regulated by our customers and Health Canada and the United States Food and Drug Administration in what we can do as we manufacture Active Pharmaceutical Ingredients.

Description of Substance

Methanol 67-56-1

Plan

Methanol is used to precipitate Dextran Sulphate as part of the purification process. We have been using this process since about 1972 and supply the finished product to many pharmaceutical companies. We are not sure of the actual end use, but have been advised by them that changes to our process require their approval as their end product is registered with the FDA. Any change may also require FDA approval which can be hard to obtain.

In 2011, the company purchased 23, 786 kilos of Methanol.

Options to be implemented:

Analysis of Options: Two options exist, Substitution or Process Modification. Both will be investigated

Analysis of Options For Technically Feasible options: It is difficult to specify if either or both options are feasible. Both seem possible in theory.

Option to be implemented

OPTION: More accurate measurement of Methanol being added will be undertaken. Further action to be determined by lab work and discussion with customers.

	Used (kg/yr)	Created (kg/yr)	On-site releases (kg/yr)			Disposal (kg/yr)		Transfer (kg/yr)	Contained in Product (kg/yr)
			Air	Water	Land	On-site	Off-site		
Baseline	23,786	0	1,657	0	0	21,900	0	0	0
New Estimated Amount	22,586	0	0	0	0	0	0	0	0
Reduction	1,200	0	0	0	0	0	0	0	0
%Reduction	5%	0	0	0	0	0	0	0	0

Savings: $1,200 \times \$0.91 = \$1,092$ per batch. At an average of perhaps 6 batches per year, the annual total could be \$6,552.

1 Certification

1.2 Certifications - Highest Ranking Employee

As of December 19, 2012, I, George USHER, certify that I have read the toxic substance reduction plan for the toxic substance 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.

(Methanol)



George Usher, President

Tel. No.: 416-755-2231

Email: gu-dextran@rogers.com

1.3 Certification by toxic substance reduction planner

As of December 27, 2012, I, Ravi Sharma certify that I am familiar with the processes at Dextran Products Limited 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 27, 2012 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

(Methanol)



Ravi Sharma, M.Sc., M. Eng., C.Chem.
Project Manager
ETCOS Inv. Environmental
Planner License No. TSRP0250
Email: etcosca@gmail.com