Toxics Reduction Legislation

The Toxics Reduction Act (TRA) and Regulation introduced by the Ontario Ministry of Environment (MOE) has been law since January 1, 2010, and several amendments have been made since that time. This newsletter provides an overview of the program requirements. Please contact us for more detailed information.

According to the MOE, the purpose of the legislation is to "prevent pollution and protect human health and the environment by reducing the use and creation of toxic substances and to inform Ontarians about toxic substances."

TRA and Ontario Regulation 455/09 set out requirements for the following:

- Toxic substance accounting
- Toxic substance reduction plans
- Plan summary reports and annual reports
- Toxic substance reduction planners

Regulated Facilities

The TRA applies to mineral processing and manufacturing facilities who meet the following criteria:

- Mineral processing facilities using chemicals with North American Industry Classification System (NAICS) codes starting with 212, or manufacturing facilities with NAICS codes starting with 31, 32, or 33
- Meet the requirements for reporting to Environment Canada under the National Pollutant Release Inventory (NPRI), or to the MOE for acetone under regulation 127/01

Toxic Substance Accounting

Each toxic substance has a reporting threshold that aligns with those of NPRI, or Regulation 127/01. However, whereas NPRI focuses on reporting emissions and disposals, the TRA also concerns toxics that are used or created in processes and manufactured products.

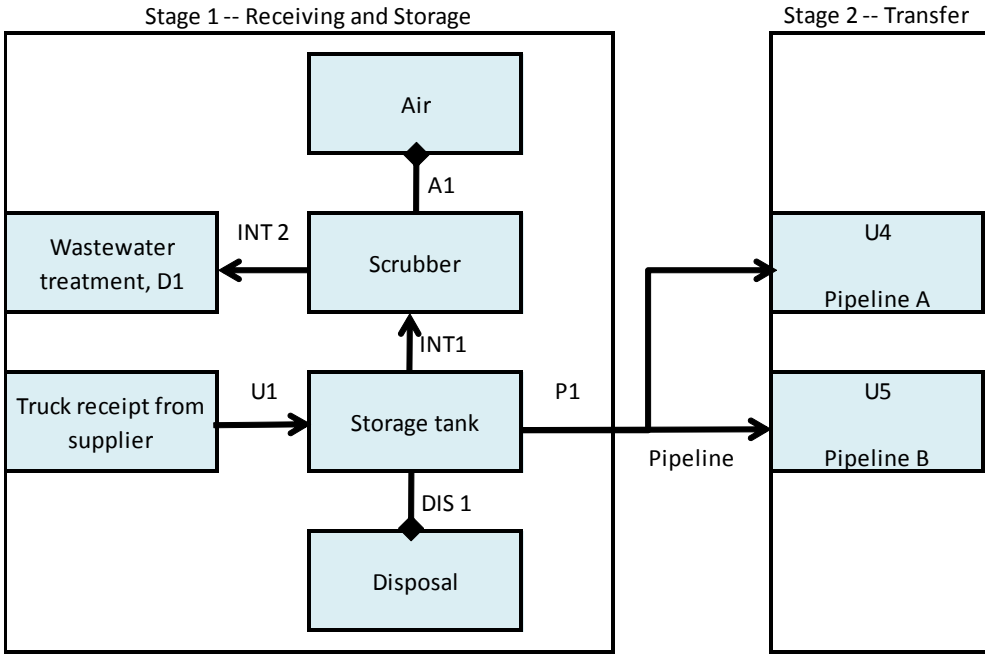
Toxics substance accounting requires considerable detail to document the amount and the disposition of the toxic substance in the operation. The regulation specifies the creation of the following records:

1. A description of every stage of the manufacturing operation at the facility that uses or creates the substance and how each stage is divided into processes.
2. Process flow diagrams that give a visual representation of the movement of the substance through each process, including how it enters, whether it is created, destroyed or transformed, how it leaves, and what happens to it after it leaves the process, and showing the relationships between the processes.

3. If the sum of the quantities of the substance that are used and created in a process does not approximately equal the sum of the quantities of the substance that are destroyed, transformed and leave the process, an explanation is required.
4. A description of the method or combination of methods used to track and quantify the substance in each process and an explanation of why they were chosen.

The best available method or combination of methods for tracking and quantifying the substance must be used, taking into consideration the process, industry standards, economic achievability, legally prescribed methods, and various methods of monitoring, testing, mass balance, emission factors, and engineering estimates. Quantification methods cannot be changed from year to year unless required by law or recommended by a certified TRA planner upon review.

The following figures illustrate an approach used by Prevention and Regulatory Solutions Ltd. (PandRS) to document stages and process, their descriptions, and integrated spreadsheet tables to quantify the required material flows. Note that these samples do not reflect any completed process or accounting records.



Stage 1 Description: HCl 29% liquid is delivered to the site by tanker truck. It is transferred to a 30,000L capacity lined storage tank. The tank has full containment and has a dedicated scrubber, Model xxx, with a scrubbing efficiency of 95%. Material that is out of specification is collected and disposed of by licensed haz waste hauler

Sample Process Flow Diagram of Toxic Substance Stages and Processes

Stage 1 -- Receiving and Storage									
I/O Analysis	Label	w/w Conc	Usage kg, or flow kg/hr	# batches or time, hr	Emission factor	Conversion	Total tonne/yr	Method Used	Best Available Method Rationale
U + C	U1	28.9%	22,000	156	1	0.001	992	Receipt records and supplier test data	Most accurate avail
	C	0.0%	0	0	1	0	0	None	
	Total U + C						992		
T + D+ P + A + L+W+ DIS+TR	T	0.0%	0	0	1	0	0	None	
	D1	8.3%	140	8760	1	0.001	102	Lab tests conducted on scrubber water	Only data available
	P1	28.9%	2,985,039	1	1	0.001	863	Totalizer from flow meter Model A2343	Best quality actual data
	A1	3.1%	2,100	156	0.05	0.001	1	Engineering calculation with published EF	EF supported by supplier
	L	0.0%	0	0	0	0	0	None	
	W	0.0%	0	0	0	0	0	None	
	DIS1	28.0%	1,000	6	1	0.001	2	Waste manifest records and lab test results	Actual records, best data
	TR	0.0%	0	0	0	0	0	None	
	Total T + D + P + A + L + W + DIS + TR						967		
Difference (U + C) - (T + D + P + A + L + W + DIS + TR)							25		
Is this difference "Approximately equal"? Yes									
Explanation if required: Not required									

Sample Quantification of Toxic Substances

Toxic Substance Reduction Plans

Toxic substance reduction plans are required to assess processes wherever the toxic substances are used. The result is intended to inspire facilities to realize the high cost of using toxic substances and the benefits of switching to options that consume or produce substances that are less toxic. Plans must address the following:

- General facility information including plant location coordinates
- Statement of intent to reduce use and creation of the toxic substance or reason for not including one
- Objectives and any targets for reducing toxic substance use or creation
- Process flow diagram showing inputs, outputs, all processes and relationships, and descriptions of processes that use or create the toxic substance
- A cost estimate of each substance and the toxic substance accounting information
- Description and analysis of at least one of seven options to reduce use and creation, including feasibility analyses. See below for more information.
- Identification of options to be implemented, including steps and timetables
- An estimate of the amount by which use, creation and discharges to air, land or water of the toxic substance will be reduced as a result
- Certification of plan by the highest ranking employee at the facility

Reduction Options

At least one option must be identified from each option category shown below, unless an explanation is provided. For each selected option, the plan must identify the estimated reductions of use, creation, discharge, and containment in the product.

Option Categories

1. Materials or feedstock 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

After the list of options is compiled, it may be pared down to those that are technically feasible. These options are then further analyzed for economic feasibility, including any anticipated savings and payback periods. The resulting options are thus considered to be both technically and economically feasible. Implementation of options is not mandatory, but the facility must indicate which options will be implemented, and detail the relevant timetables for implementation and reduction. The actual reductions achieved will then be reported in the annual reports to the MOE and public. If the facility decides not to implement any of the options, this must be declared in the plan and in the annual reports to the MOE and the public.

Toxics reduction plans are required to be produced or updated by December 31 of the calendar year that is specified by the regulation. In general, reviews are required every five years or sooner if significant process changes are made. Each plan must be signed by the highest ranking employee at the facility and by a certified TRA planner. The signatures have separate criteria, but in general they certify that the plans have been read, understood, are accurate, and meet the requirements of the legislation.

Plan Summary Reports and Annual Reports

Following the completion of each toxics reduction plan or review, a summary report for each toxic substance is required for the MOE and public. This report includes toxic substances used, facility location, owner/operator, reasons for using the toxic substance, a description of options to be implemented for reduction, estimates and timelines for reductions, and a statement that the summary accurately reflects the current version of the plan.

Each toxic substance also requires annual reports for the MOE and for the public, and are due by June 1 of each year for the previous year's data, unless changes are announced by the MOE. The MOE report is generated using Environment Canada's Single Window system available at https://ec.ss.ec.gc.ca which was formerly known as OWNERS. This report requires information for each toxic substance, including facility and personnel, quantities used, created, and contained in product, reduction plans, and steps taken to achieve reduction objectives. The public report requires similar information with less detail, and must be made available to employees, posted on the internet, and provided to the public if requested.

Toxic Substance Reduction Planners

Toxics reduction plans may be prepared by any person, but must be reviewed and certified by a licenced planner. The review process requires the planner to be familiar with the processes involving toxic substances at the facility, and to review the plans for content and accuracy. Each aspect of the plan must include recommendations for improvement or rationale for why no recommendations were made. Once the review is completed, the planner is required to certify that the plan meets the requirements of the legislation.

The MOE administers the planner licensing program for persons who can meet and provide proof of education and operational experience in relevant fields. In addition, candidates must complete a training course, pass an examination, and pay a fee. These are detailed in section 27.1 of the regulation and outlined below:

- Hold a university degree and have four years of relevant experience, or
- Hold a college diploma and have six years of relevant work experience, or
- Have eight years work experience, with at least two years in each of environmental management and operational activities in a relevant facility

The MOE has published guidelines and toolkits for the TRA. These are available at the following link. Additional information may also be available from the MOE upon request to toxics.reduction@ontario.ca.

How can we help?

Prevention and Regulatory Solutions Ltd can apply their significant manufacturing and TRA quantification experience to assist with analysis, accounting, and documentation required by this legislation. John McGeough, is a licensed planner (TSRP #0006) with experience in writing and reviewing dozens of toxic substance reduction plans in a range of industries.

Please contact us to learn more about this topic, or for assistance in determining how your facility may be able to gain value from this program.