Toronto Region Sustainability Program

TRSP P2

Tanker Cleaning » Pollution Prevention Case Study

Prokleen Washing Services

Company Overview

Prokleen Washing Services is a 25-person tanker truck and bulk tank cleaning facility located in Concord, Ontario. A wide variety of food grade materials and chemical tankers are washed at the facility, leading to very complex and variable wastewater being discharged from the facility.

Prokleen management retained the services of Enviro-Stewards to conduct a pollution prevention (P2) assessment that would address key environmental issues with regards to wastewater effluents at the Concord facility, including:

- Biochemical oxygen demand (BOD) overload;
- Methylene chloride reduction; and
- Volatile organic compound (VOC) reduction.

The assessment was administered and partially funded through OCETA's Toronto Region Sustainability Program (TRSP).

P2 Assessment Process

In April and May of 2006, Enviro-Stewards conducted an intensive in-plant study to determine baseline quantities of liquid and solid waste disposal and treatment, and the largest sources of water usage and pollution generation through the analysis of wash frequencies, procedures, and laboratory samples. A collaborative approach between Enviro-Stewards and Prokleen management and staff was taken to identify possible modes of diversion, reduction, and treatment of materials through procedural and process modification. This involves identifying sources of "pollution" early in the process chain, thereby reducing the amount produced in the first place.

Multiple benefits were realized by utilizing this approach at Prokleen's facility. For example:

Economic Benefits

- Capture and separation of pure products facilitated the diversion of organic and chemical wastes as valuable products for other producers, which is much more economical than paying to have it treated for safe disposal; and
- Capturing waste before it gets diluted with cleaner wastewater reduces the volume and therefore cost of disposal.

Environmental Benefits

- These materials become a resource rather than waste; and
- Harmful materials do not reach the sewage system.

Summary of Findings

A row of totes after being cleaned in the chemical bay

At the time of the P2 assessment, the most significant sources of pollution at Prokleen's Concord facility came from the chemical and food grade wash bays. Residual products left over in the tankers, also known as "heels", are either drained off the back of a tanker or physically removed from inside the tanker. The heels from various residual products were recovered and disposed of as liquid hazardous waste. However, heels from non-hazardous tankers would be washed without draining the heel, and thus all residual heel was mixed with the wash water and sent to the wastewater holding tank. By capturing the majority of these residual materials prior to washing, Prokleen has significantly reduced the burden on its wastewater treatment system and the associated costs. Depending on the nature of the material, Prokleen can arrange to have it reused as a product or byproduct (animal feed), which again has cost savings associated with it.

BOD reduction is crucial for Prokleen to realize environmental and financial benefits. Because excessive BOD can be harmful to aquatic organisms such as fish, municipalities must treat organic food waste before it is released back into the environment, and therefore define limits on what facilities can discharge to drain. The results of the testing during the assessment showed that Prokleen's wastewater was consistently exceeding the BOD limits of York Region's sewer-use by-law. Because of this overload, Prokleen was facing potential sewage treatment surcharges estimated at $18,000 per month on average.

Another major source of pollution came from the solvents that Prokleen staff used to clean various parts. VOCs and toxics such as toluene and methylene chloride constituted a high percentage of solvents used at the facility and contributed to sanitary sewer exceedances.

"At Prokleen Washing Services, we believe in providing top-of-the-line service to our customers at the best possible value with minimal impact to the environment. OCETA and Enviro-Stewards helped us identify and seize opportunities to go beyond environmental regulatory compliance through available technologies and process optimization. These internal changes now enhance our bottom line."

John Corrigan, General Manager, Prokleen Washing Services

P2 Solutions, Environmental Results and Related Cost Savings

Prokleen management undertook a follow-on energy efficiency study after the P2 assessment which addresses energy consumption in building services including lighting, compressor, boiler, and wastewater heat recovery.

The table below summarizes projects being undertaken at Prokleen's Concord facility from the list of recommendations outlined in the P2 and Energy Efficiency reports. When implementation is complete, these measures are projected to eliminate annually:

- 1,000 kilograms toxics
- 24 kilograms VOCs
- 28 tonnes hazardous wastes
- 91 tonnes process wastes
- 36,370 tonnes water
- 942 tonnes GHGs
- 133,800 m^3 natural gas
- 440 MWh electricity

The combined savings of the P2 and Energy Efficiency measures are expected to annually save **$348,000** with an overall payback of **10 months**.

Process	P2 Solutions	Environmental Reductions	Cost Savings & Payback
Food Bay Cleaning Targeted Pollutants: Biochemical Oxygen Demand (BOD)	Diversion of concentrated heels from sugars, oils, and flour	BOD reduction of 91 tonnes per year	Annual savings of $69 K over wastewater treatment costs Payback of < 3 months
Chemical Bay Cleaning			
Liquid Waste Reduction Targeted Pollutants: Chemical Oil, Asphalt	Diversion and recovery of chemical heels Sending of asphalt back for reuse	Reduction of 27 tonnes per year of chemical wastes (hazardous waste classes 251H and 252H) and 5,000 tonnes per year of water	Annual savings of $40 K Payback of < 1 month
VOC & Toxics Reduction Targeted Pollutants: Toluene, Methylene Chloride	Installation of solvent reuse sink Product replacement	Elimination of 24 kg per year of VOCs (toluene) Elimination of 1 tonne per year of methylene chloride → Overall reduction of 1 tonne per year hazardous waste class 241T	Annual savings of $2.1 K Payback of < 3 months
Building Services			
Water Conservation and Energy Efficiency	Reuse of compressor water Reuse of final rinses Lighting, Compressor, Boiler, Wastewater Heat Recovery measures	Reduction of 23,000 tonnes per year of water consumption and 57 tonnes per year of greenhouse gases Annual reductions of energy consumption (133,800 m3 natural gas and 440 MWh electricity), 885 tonnes GHGs, and 8,750 tonnes water consumption	Annual savings of $35 K Average payback of 4 months Annual savings of $201.7 K Payback of 1.3 years

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