NBC-00003

SIC CODE
2813

Pollution Prevention Case Study

16299

The Narragansett Bay Commission

The Narragansett Bay Commission's Pollution Prevention Program provides free, technical assistance to businesses interested in the latest waste reduction methods and technologies.

ZERO DISCHARGE BY DISPERSED PIGMENT MANUFACTURER

SUMMARY

A manufacturer of dispersed pigments achieves zero discharge of all process wastewater using ultra-filtration technology.

COMPANY BACKGROUND

The subject company operates an industrial pigment dispersion operation in Rhode Island and employs 8 people. Prior to achieving zero-discharge this company discharged its process wastewater to the NBC Bucklin Point treatment facility in East Providence Rhode Island.

PROCESS BACKGROUND

Raw pigment dyestuff is received at the facility in either a dry powder or moist cake form. At this facility the raw pigments are processed through a series of mixing, grinding, and high pressure dispersing operations producing a liquid dispersed pigment product used primarily by the paper industry.

Equipment and facility washing processes generate a wastewater stream contaminated with the dispersed pigment product. While these pigments and dispersion materials are non-hazardous, colored wastewater can cause problems at the municipal treatment plant receiving these wastewaters. Such problems may include: disruption of the biological treatment process, pass through to the receiving waters, or coloration of the municipal wastewater treatment sludge. In order to continue discharging this waste stream the company would need to install a pretreatment system capable of removing the color.

POLLUTION PREVENTION ACTIVITY

Ultrafiltration uses a semi-permeable membrane to effect separation of dissolved and un-dissolved contaminates from an aqueous solution. Colored wastewater is pumped under pressure through a tubular membrane configuration. Clean water (permeate) passes through the membrane, tangential to the flow of wastewater, and exits the filtration unit opposite the wastewater (concentrate) side of the tubular configuration.

For more information call 277-6680, TDD 277-6680, or write Pollution Prevention Manager, 235 Promenade Street, Suite 500, Providence, RI 02908

POLLUTION PREVENTION ACTIVITY

Ultrafiltration membranes are capable of separating out particles in the size range of 0.01 - 0.1 microns. The dye pigments, typically 1.0 micron in size, are easily retained in the concentrate side of the membrane.

CAPITAL COSTS

The ultrafiltration equipment purchased by this company required a capital expenditure of twenty eight thousand dollars ($28,000.00). This cost includes all required tanks, ancillary pumps and piping, and installation.

COST ANALYSIS

ITEM	ORIGINAL PROCESS	MODIFIED PROCESS
Discharge Permit:	$1,800.00	$250.00
Hazardous Waste Disposal:	-0-	-0-
Solid Waste Disposal:	-0-	$200.00
Water Use:	$350.00	-0-
Energy Use:	-0-	negligible
Compliance Monitoring:	$500.00	-0-

RESULTS

Recycling of this wastewater stream using ultrafiltration resulted in the complete elimination of wastewater discharged from this company; thereby eliminating the need for a discharge permit, wastewater monitoring and treatment costs, and liabilities associated with the discharge of industrial wastewater.

REGULATORY IMPACT

The company was required to obtain a Zero-Discharge permit from the NBC.

WASTEWATER IMPACT

The company has eliminated the discharge of approximately 1,000 GPD of industrial wastewater.

HAZARDOUS WASTE IMPACT

No hazardous waste is generated by this recycling operation.

SOLID WASTE IMPACT

This recycling operation generates a small amount of concentrate that is currently solidified and disposed of in a sanitary landfill. A future goal of this company is to find a use for this concentrated dye stuff resulting potential raw material savings.