DOC. NO. 216

/ / / / / / / FACT SHEET DEPARTMENT OF TOXIC SUBSTANCES CONTROL

PAINT MANUFACTURERS CAN SAVE MONEY ON ENVIRONMENTAL COMPLIANCE COSTS

SCIENCE, POLLUTION PREVENTION, AND TECHNOLOGY PROGRAM / / JANUARY, 1997

Pollution prevention can be very beneficial for a manufacturing company as well as for the environment. Pollution prevention through source reduction can save on environmental compliance costs, by minimizing the generation of hazardous waste. Besides saving costs, hazardous waste minimization means less waste is generated, less waste is stored, and less waste is transported. Hazardous waste minimization also means less waste is managed by treatment, incineration, and land disposal. Pollution prevention can mean improved profits, less hazardous waste impact on the environment, and less risk of hazardous waste impairment of the environment.

Compliance with environmental laws is a significant cost to the paint manufacturing industry. Environmental compliance costs include permit fees; monitoring, reporting, and recordkeeping; operator training; and waste transportation and disposal costs. Unfortunately, environmental compliance costs are often lumped into overhead or indirect categories by conventional accounting practices. This hides true compliance costs, and hinders production managers from tracking cost savings that result from their waste reduction efforts.

This factsheet focuses on some typical waste management costs in the paint manufacturing industry. It presents case studies illustrating how some California paint manufacturers avoided these costs while improving environmental compliance. The case studies also show how source reduction can reduce the amount of raw material that becomes waste. This is done through reuse of spent material, and by making process improvements. This results in additional savings, by reducing raw material costs.

Do you know what it costs for environmental compliance at your operation? Table 1 summarizes typical waste management cost information obtained from four paint manufacturers in California. Manufacturers have stated that their environmental costs can range up to one percent of their total gross

This Fact Sheet was produced by the Source Reduction Unit in cooperation with the California Paint Council to assist generators throughout the State of California.

annual sales. Pollution prevention can reduce or eliminate these environmental costs, and can change this one percent from a cost into a profit!

While the costs in Table 1 are significant, many are avoidable. By tracking waste management costs, a paint manufacturer can focus waste reduction efforts and realize sizeable cost savings and reduced liability by avoiding waste generation.

Table 1 Waste Management Cost Summary [1]

Activity	Cost Range [2]
On-site Handling	$19,600 - 29,400
[illegible]	0 - 30,600
Hauling, Insurance, and Disposal *Fuel blending of spent solvent @ $0.84 - 1.19 per gallon* *Discharge of wastewater @ $0.006 - 0.007 per gallon*	58,900 - 118,800
[illegible] Taxes	12,000 - 42,000
Monitoring and Testing	2,000 - 3,800
[illegible]	150 - 1,500
Permitting *Air quality management district @ $5,900 - 15,000* *Wastewater discharge @ $0 - 500* *Fire department @ $2,000 - 5,000* *County planning and zoning @ $0 - 600*	7,900 - 21,100
[illegible]	480 - 7,300
Recordkeeping	1,000 - 3,700
[illegible]	8,400 - 60,000
Total Annual Costs [3]	**$170,700 - $212,400**
[illegible] percent of sales	0.8 - 1.2 percent
Cost per gallon of manufactured paint	$0.029 - 0.116

Ways to Save

Tables 2 and 3 report waste reduction cost savings based on case studies of Akzo Nobel Coatings and Frazee Industries. These tables illustrate how operating costs were reduced through waste reduction programs.

Examine these case studies in light of your operations. **Can you identify similar or other cost saving waste reduction opportunities?** Remember that waste reduction measures not only save cost and improve profitability, but also contribute to environmental improvement and avoid future liability.

After reviewing these case studies, can you more closely relate your operations costs to waste reduction? You then might see opportunities to reduce operating expenses and contribute to environmental improvement.

CASE STUDY: REUSE SPENT CLEANING SOLVENT

Spent cleaning solvent is a hazardous waste commonly generated by the paint manufacturing industry. Spent solvent should always be kept separated from other wastes, so that it can be reused. Spent cleaning solvent can often be reused as a process ingredient in batches of compatible formulation.

Table 2 illustrates how Akzo Nobel Coatings, Inc. realized cost savings for their spent solvent reuse process. **With this source reduction strategy, Akzo Nobel realized annual cost savings of almost $200,000!**

CASE STUDY: AUTOMATED WASHER FOR PORTABLE MIXING TANKS

Frazee Industries, Inc. estimated a reduction in

Table 2 Cost Analysis: Reuse Spent Cleaning Solvent [4]

Costs	Solvent Disposal	Solvent Reuse	Difference
Raw Material Value @ $1.88 per gallon	$134,420	$0	$134,420
[illegible]	60,060	0	60,060
Direct Labor and Handling, 500 batches @ 15 min/batch	1,725	0	1,725
[illegible]			[illegible]

spent solvent generation of 40 percent through the purchase of a portable mixing tank washer. The washer is fabricated to customer specifications in order to clean any size tank or tote. The washer incorporates an automated low pressure wet-down spray and mechanical brush for stripping coated materials. A decanting tank collects all wash solvents used in the cleaning cycle. The decanting tank separates the waste sludge solids from the reusable wash solvent. The washer and decanting tank system accomplished the following:

- decreased washing time per tank
- decreased use of wash solvent per tank
- reduced volatile organic carbon (VOC) emissions
- reduced operating costs
- improved productivity and enhanced employee safety

Frazee chose to use a specialized low VOC wash solvent. This decision increased solvent cost per gallon. However, this decision saved money by eliminating the need to install "best available control technology" to reduce VOC emissions.

Prior to the installation of the automated tank washing machine, portable mixing tanks were washed manually. Solvents for manual washing were selected to maximize spent solvent reuse into subsequent batches of paint. However, for large numbers of small volumes of solvent, this reuse practice is costly due to both solvent usage and labor.

Table 3 shows a project payback of 0.73 years and a net savings of $25,000 at the end of the first year.[5] Frazee can expect future net savings in subsequent years of almost $100,000 annually.

Table 3 Cost Analysis: Automated Washer for Cleaning Portable Mixing Tanks

Capital Investment for Automated Washer	Capital Cost
Equipment purchase of automated washer	$80,716
Installation [6]	[illegible]
Permits and approvals [7]	1,185
Depreciation benefit [8]	[illegible]
Total Capital Cost	**$71,371**

Annual Operating Costs	Manual Wash [9]	Machine Wash [10]	Savings
Solvent materials usage	$73,320	$42,014	$31,306
Spent solvent disposal	51,870	5,283	[illegible]
Labor	27,780	8,334	19,446
Gross Annual Savings			[illegible]

Simple Payback and Break Even Point [11]	0.73 year
Net Savings for the first year [12]	$25,968

ADDITIONAL PUBLICATIONS / / /

Hazardous Waste Minimization Checklist and Assessment Manual for Paint Formulators

California Waste Exchange Directory, Newsletter/ Catalog

Hazardous Waste Minimization Bibliography

Waste Minimization Fact Sheet for Paint Formulators

Guidance Manual for the Hazardous Waste Source Reduction and Management Review Act of 1989 – Senate Bill 14

Assessment of Selected Paints and Allied Product Manufacturers Source Reduction Facility Planning Efforts

Appreciation is extended to the California Paint Council for their helpful review and comments.

FURTHER INFORMATION / / / / /

For more information contact the:

Department of Toxic Substances Control
Office of Pollution Prevention and Technology Development
Technology Clearinghouse Unit
P.O. Box 806—HQ25
Sacramento, CA 95812-0806
(916) 322-3670

For information about regulatory requirements, contact the DTSC office nearest you:

Sacramento	(916) 255-3545
Clovis	(209) 297-3901
Berkeley	(510) 540-2122
Glendale	(818) 551-2800
Long Beach	(310) 590-4868

To get an EPA ID number, call:

Department of Toxic Substances Control
(916) 324-1781

[1] Data is based on paint manufacturers with annual sales in the range of $17 to $71 million. Production capacity ranges from relatively small manufacturers annually producing less than 2 million gallons to large manufacturers annually producing over 7 million gallons of paint. The employment range is from 59 to 117 plant employees. Wages range from $9.80 to $15.00 per hour.

[2] These costs do not include future site remediation liability, nor do they account for costs associated with raw material loss.

[3] Note that Total Annual Costs does not equal the column sum due to individual facility variations.

[4] Akzo Nobel uses 28 stationary product mixing tanks, capacity range from 800 to 3,000 gallons. Solvent Reuse averages 275 gallons per day, or 71,500 gallons per year.

[5] For a thorough analysis, the Net Savings chart should include all service years, with years 2 through 7 including the Depreciation benefit. Also, Table 3 should include adjustments for the marginal corporate income tax rate in all Depreciation and Savings values. Ask your corporate accountant.

[6] Cost for electrical contractor, power already available.

[7] Initial permit fees to install equipment include air quality district permit and other regulatory approval costs.

[8] Seven year straight-line Depreciation. For the first year, Depreciation is deducted directly from Capital Investment.

[9] On average, 20 minutes and 6.5 gallons of solvent costing $1.88 per gallon was used to hand wash a tank. Additional costs may occur for storage, handling, and reporting.

[10] On average, 6 minutes and 275 gallons of solvent costing $6.25 per gallon were used by the automated washer on an 18 day cycle. Additional costs may occur for utilities and permitting.

[11] Simple Payback equals Total Capital Cost divided by Gross Annual Savings.

[12] Net Savings for the first year equals the Gross Annual Savings less the Total Capital Costs.

Printed on recycled paper and vegetable-based ink with 30% post-consumer waste.

96 32936