

# Herdsman Dry Cleaners

## Summary

*The case study is a typical Cleaner Production project has produced economic, environmental and workplace benefits. The project involved a premises refit including purchasing of the latest drycleaning machine and the installation of a carbon filter to eliminate solvent contact wastewater. This work has enabled the business to reduce its use of chemicals by 83%, reduce its generation of hazardous wastes by 50%, eliminate the generation of contact wastewater and reduce their energy consumption by 14%. In relation to work-place benefits the new plant requires less space allowing the workplace to be less cluttered. Productivity has improved while the level of fugitive emission has dropped considerable leading to a safer workplace for both staff and management.*

## Background

Herdsman Drycleaners is a Churchlands based business whose proprietor has 30 years experience in the drycleaning industry. In addition to the retail drycleaning service, the company operates and adjoining coin operated laundrette. The business currently employs two staff members. The business does not operate a pick-up and delivery service or employ agencies. The company cleans over 2,600 garments each month.

The company is committed to improving its environmental performance and is participating in an Industry Best Practice Program for the Western Australian Dry Cleaning Industry. This joint initiative of the Drycleaning Institute of Australia (DIA) and the Centre of Excellence in Cleaner Production of Curtin University of Technology, this program benchmarks the environmental and financial performance of the local industry and providing information on how performance can be improved. This participation lead to the development of an approved Cleaner Production Action Plan and the presentation of a Cleaner Production Certificate by the Centre of Excellence in Cleaner Production, this action plan was the initiative that lead to many of the improvements outlined in this case study.

Its current owner purchased the business in August 2001. At the time of negotiating the purchase of the business the prospective owner realised that the premises would require a comprehensive refit in the near future. The owners of Herdsman Drycleaners recognised an opportunity to introduce Cleaner Production improvements when the decision was made to refit the premises.

## The Process

The company operates a typical dry cleaning operation. Once a garment is received from a customer the need for special care or particular cleaning requirements (eg stains or spots) is assessed. Any stains are treated appropriately and then garments are sorted on the basis of colour, fabric and other characteristics.

The garments are then loaded into an Ilsa dry-cleaning machine, in which they are immersed in perchlorethylene (a solvent). During the first wash, which takes 4-6 minutes, the perchlorethylene (perc) and soaps dissolve any grease and oil. The solvent is then removed and recycled in a still, where evaporation followed by condensation recovers most of the perc for reuse. This process also produces a liquid waste residue that has to be legally disposed of.



A second wash, generally known as an optional 2-bath system then takes place using the recycled perc to ensure that the garments are clean. Again the solvent is reprocessed to be used in subsequent washing cycles. Following this second wash the garments are dried. The temperature used to dry the garments is dependent on the fabric of the garments, this process takes 20-25 minutes. As the garments dry, the air in the machine is

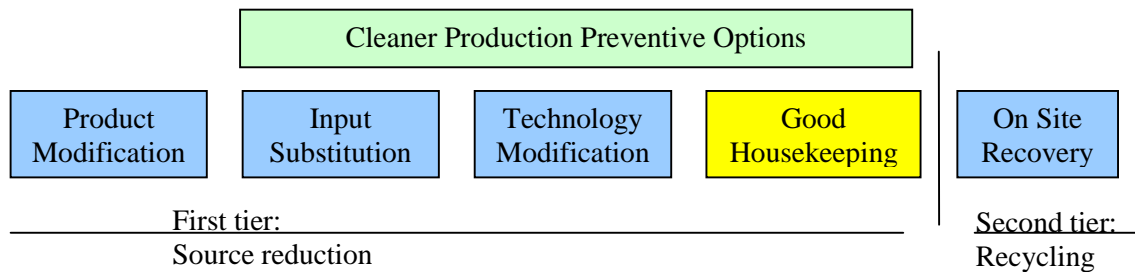
passed over cooling coils so that the contained perc can be recovered and removed from the garments.

Garments are then checked to ensure they are clean. They are then steam formed and conditioned to soften the fabric, give it body and shape and remove any wrinkles. Machine pressing or hand ironing then takes place, and the garment is wrapped in preparation for collection by customers.

### Cleaner Production Initiative

Initiatives have included the purchase of an advanced drycleaning machine, to replace the two existing machines, the installation of a carbon filter and a variety of good housekeeping measures introduced during and since the premises refit. Many improvements, particularly in perc efficiency together with a reduction in the generation of hazardous wastes, improved energy efficiency as well as an improvement in the work environment and increases in productivity have been achieved.

### Cleaner Production: Prevention Practices



While small business of this type have very limited or no ability to conduct product modification or to introduce input substitution because of the industry's reliance on perc as a cleaning solvent, the business has, introduced the other three Cleaner Production practices

### Technology Modification

Herdsmen Drycleaners had adopted technology modification through the purchase of a new drycleaning machine. This machine replaced two existing machines with a single machine. This machine is currently operating at 60% capacity therefore allowing for expansion of the business. An additional feature of this machine is that it creates negative pressure within the cage when the door is opened to prevent perc fumes from entering the work area. The single machine due to inbuilt energy efficiency mechanism uses on average 17% less electricity to clean each garment. Through a combination of improved efficiency of the new machine and poor maintenance and leaks on the old machines, perc consumption has fallen by 80% since the refit. The improved still design has reduced perc

waste generation by 50%. As would be expected the purchase of the new machine maintenance requirements have dramatically reduced.

**On-site Recycling**

The new drycleaning machine contains a double water/perc separation system that allows an increased recover of perc and an improved quality of contact water. To further recycle this contact water, Herdsman Drycleaners installed an Activated Carbon Filter. This filter allow the contact water to be filtered to level acceptable to the WAWA standards, after this the water can be disposed of along with the normal waste water.

**Impact of filter on water quality**

Element	Before	After
Perc	2ppm	0.054 ppm
BOD	5000ppm	136ppm
Total Grease	50ppm	21ppm
TSS	200ppm	15ppm

(Data from quality of water test)

The contact water is first allowed to settle for 8 hours in the top container to allow settling of sediment. After this period of time the waste is gravity fed through the filter, which absorbs the perc and return water to the bucket, which is disposed of in the normal manner. The carbon filters have a life expectancy of 2000liters (approx 1-1½ years at current production and cost approx \$120)



**Activated Carbon Filter**

**Safety and Productivity**

Of great concern to the new owners was the liability risk of the existing machines as they emitted detectable levels of perc into the work area. Worker productivity improved with the purchase of a new drycleaning machine for two reasons. First the new machine was physically smaller then either of the existing machines and this extra workspace has allowed an improved flow of garments that had improved productivity. Secondly the new machine has a greater capacity and its cycle times are shorter with a greater degree of flexibility to select cycles to suit the type of garments and throughput. These productivity improvements allow the owner to reduce their workforce; not a decision he took lightly.



Wayne Flower with his Cleaner Production certificate



The open work area

## Financial and Environmental Benefits

Issue	Performance		Annual Savings	
	Old	New	%	\$
Perc Consumption (litres year)	1,440	240	83	3,960
Perc Waste (litres year)	480	240	50	1,080
Perc Contact Water (litres year)	960	0	100	1,440
Electricity (units/day)	90	75	17	865
Gas (units/day)	250	220	12	540
Maintenance (\$/month)	400	100	75	3,600
Increased Productivity (wages at \$15 hr	33.5	30	15	13,650
<b>Total</b>				<b>25,135</b>
Cleaner Production options under consideration				
Closed Water System (remove cooling tower to reduce water consumption and maintenance costs)			90	1,500
Rework steam pipes			25	1,450

**Table 2. Payback Periods**

Item	Purchase Price	Savings	Payback period
Drycleaning Machine	62,000	23,695	2.6 years
Carbon Filter	800	1,440	7 months
Cleaner Production options under consideration			
Closed Water System	4,000	1,500	2.8 years
Rework steam pipes	1,000	1,459	8 months

### Cleaner Production Incentive

Herdsmen Drycleaners is committed to improving all aspects of their business and introduced Cleaner Production practices into its operations in order to improve both the environmental and financial performance of the company. To achieve this aim the owner is considering the introduction of a closed water system. This process would eliminate the need to maintain the cooling tower that must be maintained by licensed contractors to reduce the possible of disease developing within the water tower. The owner is also investigating the reworking of his steam lines to increase the boiler efficiency.

### Barriers

The main barrier to the implementation of the Cleaner Production options has been staff participation. The majority of the staff carried their employment over from the previous ownership and were reluctant to alter established work-practices. As in most small businesses, time is a precious commodity and it is primarily dedicated to running the business and satisfying customer requirements.

### Contact

Wayne Fowler  
Herdsmen Dry Cleaners  
2/3 Flynn Street  
Churchlands WA 6018  
Ph: 9387 3125

This case study was developed by the Centre of Excellence in Cleaner Production (CECP). The CECP is proudly supported by the Waste Management and Recycling Trust Fund.