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DRAFT

Making the Most of Your Cleaning Business:

**Dry Cleaning / Wet Cleaning Case Studies
and
Financial Analysis Worksheets**

Office of Pollution Prevention and Toxics

Design for Environment Program

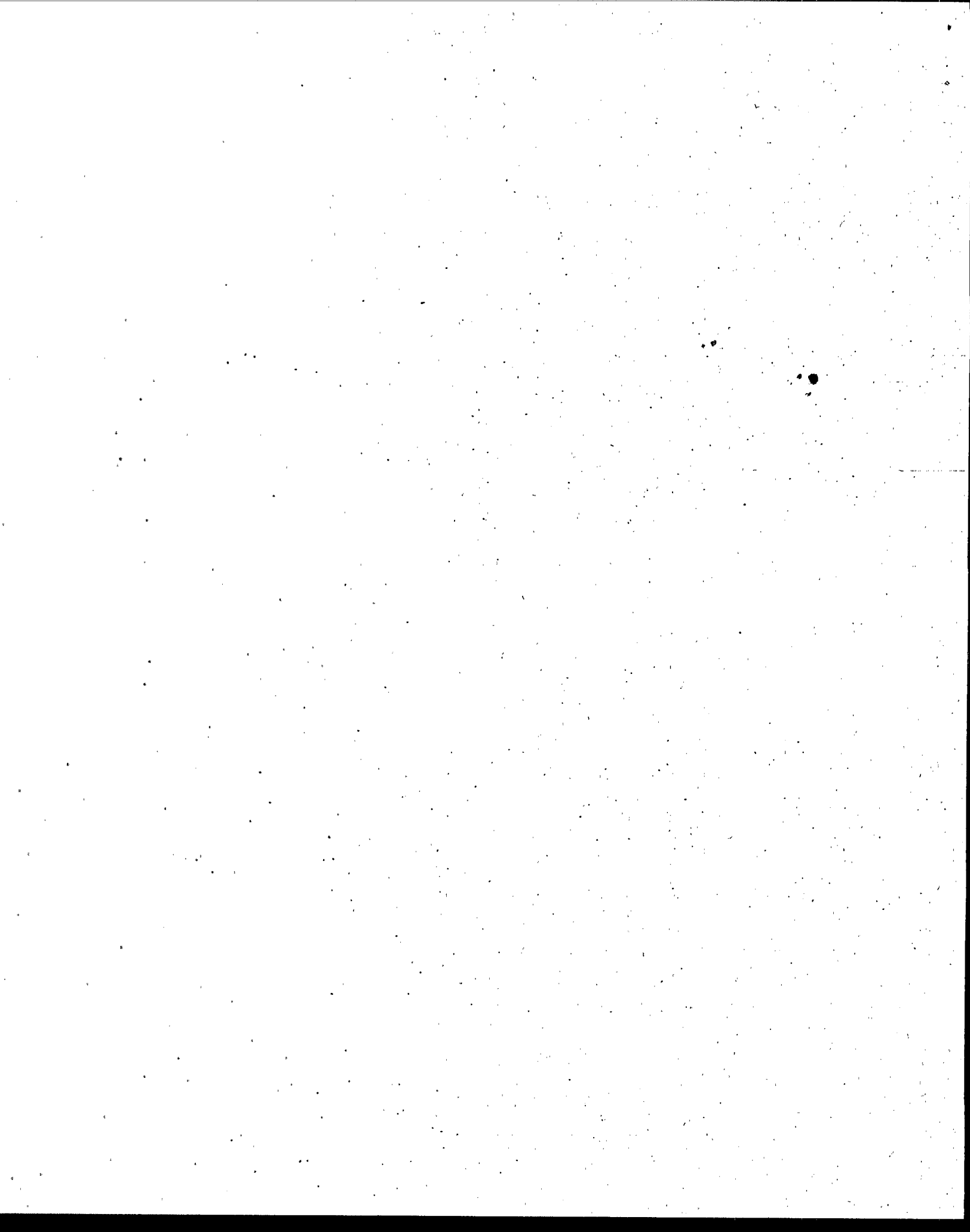
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1. INTRODUCTION

The dry cleaning industry is currently going through a significant transition. Increasing regulatory and consumer pressure will change the face of the industry within the next five to ten years. The driving force for this change centers around the environmental and health effects of perchloroethylene (perc), the most commonly used solvent in the industry. The amount of perc used and emitted by dry cleaning shops as waste is under increasing scrutiny. Although there is still debate as to the extent of the environmental and human health impacts of perc, one thing is certain—efforts to reduce or eliminate the emissions of perc are required by law and are well underway. The two factual case studies and financial analysis worksheets contained in this document can assist U.S. commercial dry cleaners in assessing their options to minimize or eliminate perc waste and emissions.¹

Any modification to your current cleaning process—either the purchase of more efficient dry cleaning equipment or changes in housekeeping practices—has a financial impact on your business. You need to recognize this financial impact so that you can manage your business wisely. Often, pollution prevention (P2) investments and process changes can save you money because they improve your solvent mileage and reduce your legal environmental liability. To assist dry cleaners in decision-making around these investment and process changes, this document contains two factual case studies that each explore an investment decision and financial analysis worksheets that you can use in making your own investment decisions.

The case studies in this document describe in detail real-world investment decisions by perc dry cleaners who decided to supplement and partially replace perc operations with wet cleaning technology. Each contains a description of the technical considerations associated with the particular investment as well as a description of the up-front investment costs and annual operating costs and savings associated with the investment. You can use these case studies to inform your own investment decision-making process.

Even though the case studies describe investments in wet cleaning technology, the financial analysis worksheets in this document have been designed with both dry cleaning and wet cleaning equipment upgrades and purchases in mind. In other words, the worksheets can be used to assess both dry cleaning and wet cleaning improvements to your current operations. The worksheets will assist you in identifying costs and savings relevant to a purchase you have in mind and organizing the cost information itself.

In some cases, a cleaner knows exactly what type of equipment he or she wants. In other cases, a cleaner may be choosing between different types of equipment, e.g., between perc equipment and high-tech wet cleaning equipment. These worksheets can be used to assess the financial impact of either type of investment decision. In addition, they can be used to assess the impact of operational decisions that do not require an up-front equipment purchase, e.g., a change in housekeeping practices such as frequency of machine maintenance.

¹ This document was developed in conjunction with EPA's *Pollution Prevention and Waste Minimization Manual for Drycleaners*, 1997. For more information on technical P2 options for dry cleaners, please refer to this manual.

You may choose the level of detail you want for your analysis. For example, you can use one part of the worksheets as a simple checklist to identify those annual operating costs that might change with the purchase of a fourth generation dry cleaning machine. If you wish, you can then go further by choosing to obtain dollar estimates for those cost you identify, by gathering data from your shop and your equipment vendor. The second case study in this document illustrates use of the worksheets.

2. CONVERSION TO WET CLEANING 100% ON SITE - CASE STUDY: UTOPIA CLEANERS, ARLINGTON MA

This case study describes a dry cleaner who completely removed perchloroethylene (perc) from one of his shops, Utopia Cleaners in Arlington, Massachusetts. The cleaner still operates a perc cleaning machine in a second shop in nearby Somerville, Massachusetts. However, this case study focuses on the transformation of Utopia to a 100% wet cleaning facility.

2.1. Background

In 1992, the owner opened Utopia Cleaners in Arlington, Massachusetts as a perc dry cleaning facility. The Utopia site had been a perc cleaning shop prior to 1992, so much of the equipment and necessary items for perc cleaning were already in place. Shortly after the cleaner began operating the shop, however, he was drawn into a legal liability suit for perc contamination at the site. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund), all past and **current** owners are held liable for contamination at a site no matter who was responsible for the contamination. Even though Utopia had just opened and the contamination was most likely from the previous owners of the perc cleaning shop, Utopia was held as a legally responsible party. Thus the cleaner was faced with the daunting reality of learning the Superfund regulations and was drawn into expensive legal battles because he was the current operator of the shop. The cleaner was held liable until the parties actually responsible for the contamination were found and the case settled. The legal battles over perc contamination at the Utopia site lasted for four years.

Despite this negative experience, the owner wanted to continue operating a cleaning business in the area. However, the legal battle and four years of frustration from perc contamination encouraged him to find a way to minimize the potential impact of future perc regulations and liability on his business. The fear of liability was the primary reason the cleaner started to investigate wet cleaning as an alternative to perc. In 1996, Utopia moved to a new building (several blocks away from the contaminated site) and became a 100% wet cleaning facility.

2.2. Prior Dry Cleaning Operations

From 1992 to 1996, the Utopia shop consisted of a nine-year old closed loop dry cleaning machine. Immediately after opening his shop, the cleaner started looking for alternatives to perc because of the perc contamination on the site. In 1994 he started to wet clean garments in a machine called the Fashion Ace. This simple machine resembles a wash basin in which garments are hand-washed using water and enzymatic agents to remove stains. The cleaner became experienced with wet cleaning in the Fashion Ace while continuing to dry clean the majority of garments in the closed-loop perc machine. The wet cleaned garments were air dried, which resulted in many garments hanging throughout the shop.

In addition to Utopia, the cleaner owns a second shop in nearby Somerville Massachusetts. The owner had a perc transfer machine in his second shop in Somerville but in 1993, he stopped operating the transfer machine. After this point, all professional cleaning was done at Utopia using perc and only laundering was done in Somerville.

In summary, in 1995, Utopia did all the professional cleaning for garments collected at both Utopia and the Somerville shop. Roughly 200 to 400 garments per week were wet cleaned using the Fashion Ace, and the remaining 1,250 to 1,450 garments per week were cleaned in the closed-loop perc machine. All laundering was done at the shop in Somerville.

2.3. Initial Experience with Wet Cleaning

The cleaner was quick to note the advantages and disadvantages of wet cleaning based on his experience with the Fashion Ace machine. He was pleased with the performance of wet cleaning, noting that some garments came out cleaner, fresher, and brighter with more natural tones. The cleaner also noted a particular advantage for items that are problematic in perc cleaning such as wedding dresses, coats with leather trim, and garments with beads and buttons (which sometimes melt in perc machines).

The disadvantages of wet cleaning with the Fashion Ace machine were also quickly noted. First, cleaning was more labor intensive with the Fashion Ace machine than with the perc machine. The Fashion Ace can only wash between one and four garments at a time and each batch of garments has to be physically hand placed into a tub containing the enzyme-water bath, gently hand scrubbed and removed. Second was the difficulty in drying clothing. With the Fashion Ace, all garments were air dried, which required a significant amount of shop space. Additionally, air drying the garments often resulted in more wrinkles. Thus, pressing the garments took longer when compared to perc dry cleaning. A third problem involved shrinkage of clothing. With time and experience, however, the cleaner was able to minimize shrinkage by selecting garments to wet clean that did not readily shrink.

Throughout this time period, the cleaner was researching more automated machines that would allow him to wet clean much larger volumes of clothing. Due to the extremely negative experience the cleaner had had with perc, and his increasing confidence in wet cleaning with the Fashion Ace, he decided to convert the Utopia shop to wet cleaning operations only. He made this conversion to 100% wet cleaning at Utopia when he moved to a new, uncontaminated shop location in 1996.

In addition to the performance benefits the cleaner witnessed with the Fashion Ace, the cleaner had in mind the full advantages associated with completely eliminating perc from his shop by converting Utopia to a 100% wet cleaning facility. Eliminating perc would eliminate all hazardous waste at his shop and allow him to completely avoid all associated regulations. With a 100% wet cleaning facility, he also would be able to eliminate all potential health effects and potential liability from the use of perc. The cleaner would no longer have to clean the perc distillation unit, which is routinely required for normal operation of his perc machine. His shop

did not have a good air ventilation system and he would feel dizzy after cleaning the still, sometimes for as long as an hour.

The choice to go to all wet cleaning at the facility was made easier by the fact that the owner would still have the option to clean some clothing in perc at his second shop in Somerville. Around the same time he converted Utopia to a 100% wet cleaning shop, the cleaner upgraded his Somerville shop with a fourth generation perc machine.

There were other incentives besides regulations, liability, and performance to have only wet cleaning at Utopia. The cleaner also felt wet cleaning was economically feasible. The rising costs for perc and the rising cost for the disposal of filters added to the attraction of a shop where these costs would be completely eliminated. The potential for reduced electricity and water costs also was considered.

In choosing wet cleaning equipment for his new shop, the cleaner tried to minimize or eliminate the disadvantages he experienced with the Fashion Ace machine.

2.4. Current Utopia Operations - Wet Cleaning Only

Since the cleaner was moving to a new location and was renting all the perc dry cleaning equipment at the former Utopia shop, he had to buy all the necessary equipment for an entire shop. Major equipment for the new wet cleaning facility included the following:

- Four 20 pound DaeWoo Air-Power Washers
- One 50 pound industrial sized dryer with automatic air control
- Pressing equipment (pants presser, form finisher)
- Spotting board
- Boiler system
- Compressor

The four DaeWoo machines are much more automated than the Fashion Ace. The capacity of the DaeWoo machines also greatly increased wet cleaning capacity when compared to the Fashion Ace. The four air-powered washers are roughly equal in cleaning capacity to a 40 pound perc machine. The cleaner particularly likes the flexibility of four separate machines. He is able to sort similar fabrics together into smaller loads. This flexibility allows for more uniform cycle settings for similar clothing. It also allows him to clean "rush orders" without significantly disrupting operations. A typical load in one of the four DaeWoo washers might include 12 silk blouses or 4 suits (total of eight pieces).

The cleaner accepts all types of garments over the counter at both his wet cleaning shop (Utopia) and his dry cleaning shop in Somerville and transports clothing between the shops for the appropriate cleaning process. Utopia receives roughly 100 garments per day across the

counter; 70% to 80% of them are wet cleaned there and the remaining garments are cleaned in perc at the Somerville shop. The Somerville shop receives roughly 150 garments a day across the counter; approximately 25% to 30% are wet cleaned at Utopia and the remaining garments are dry cleaned on site. Combining the two shops, the owner estimates that 250 garments are cleaned each day. The split of cleaning method on average is roughly 50% wet cleaned and 50% dry cleaned. None of these estimates includes standard laundering of garments.

With the four wet clean machines, Utopia is currently wet cleaning at full capacity. The cleaner estimates that the total amount of garments from both shops could easily increase to 80% wet cleaning if there was more capacity. The cleaner is already taking steps to wet clean more garments. As of January 1997, he has decided to purchase another wet cleaning machine for the Somerville facility so that clothing can be wet cleaned on-site. Thus, the Somerville facility will be a mix of wet cleaning and dry cleaning while Utopia will remain 100% wet cleaning on-site with some clothing being sent to Somerville for perc cleaning.

With the Fashion Ace and pressing equipment at the original Utopia, the cleaner was only able to press roughly 12 garments per hour. With the current equipment at the 100% wet cleaning Utopia shop, the cleaner has been able to improve his pressing time per garment to 17 garments an hour. There are two contributing factors to the faster pressing time. First, the dryer has a large drum that allows for tumbling and produces fewer wrinkles compared to the air-dried garments in the original Utopia. Second, his new pressing equipment puts tension on the garment while steam is applied. The cleaner estimates that 90% of wrinkles are removed from garments with one pass of steam. However, wet cleaned garments still require more pressing labor than dry cleaned garments. The same pressers can press roughly 20 garments an hour for perc cleaned garments. The cleaner estimates that on average, an extra 45 minutes to an hour per 100 garments is required to press wet cleaned garments compared to pressing dry cleaned garments.

The cleaner also noted that training employees to run his wet cleaning system is slightly more complex than training someone for perc cleaning. The person running the washers must have knowledge of fabric types and wet cleaning equipment operation. Because the four washers at Utopia are similar in size to conventional home washers, smaller loads have to be separated by fabric type and color. Also, depending on the fabric load, different settings on the washer must be used. For example, if a silk load is washed at a setting for wool, the water will be extracted at a rate and speed that may damage the finer silks. Thus, operator knowledge of fabrics and attentiveness to machine cycle settings are very important.

As a rough rule of thumb, the cleaner does not wet clean heavy wool suits. There are two reasons for this. First, heavy wool suits take longer to dry. Since the cleaner is wet cleaning at capacity, he can do more loads if the washers and dryer are not occupied for longer cycle times with heavy wool suits. In the cleaner's opinion, it is more efficient to dry clean wool suits given the equipment in the two shops. Second, wool suits put more "wear and tear" on the washers because they are so heavy when wet. Despite this rule of thumb, the cleaner does note that many wool suits can be wet cleaned. In fact, some customers request to have their suits wet cleaned and

the cleaner is able to provide this service.² Overall, the cleaner enjoys the added flexibility of having the choice to clean such garments with perc or with water.

The cleaner is very pleased with the choice to perform 100% wet cleaning at Utopia and is now an advocate of wet cleaning. Although he wants to maximize wet cleaning in his operation, he is quick to note that he still prefers perc for some garments and that he could not wet clean all garments coming from his two shops. However, having both water and perc as cleaning agents, he is able to take full advantage of both their cleaning abilities.

2.5. Discussion of Costs

The discussion and accompanying table compare the one-time investment and annual operating costs for the current 100% wet cleaning operations at the new Utopia shop to the one-time investment costs and annual operating costs relevant if the new shop had been a perc shop instead.

The one-time investment costs for the new wet cleaning shop are based on actual purchase prices for the wet cleaning equipment, while the one-time investment costs for an equivalent perc shop are estimates of what it would have cost to establish perc operations at the new facility instead. The annual operating costs for the new wet cleaning shop are based on the actual operating costs of the new Utopia in 1996. Annual operating costs for the equivalent perc facility are based on 1995 operating cost data from the old Utopia perc shop.

One major issue in using 1996 operating cost data from the new shop and 1995 operating cost data from the old shop is the difference in the volume of garments cleaned in the new versus the old Utopia shops. The former dry cleaning shop dry cleaned roughly 1,350 garments per week while the current shop wet cleans roughly 750 garments per week. The estimate of 1,350 garments dry cleaned in 1995 at the former Utopia is based on wet cleaning 300 garments per week out of 1,650 garments received overall. The 750 garments per week currently wet cleaned at the 100% Utopia is based on wet cleaning 50% of the combined total 1500 garments received at the current Utopia and Somerville shops. This difference in cleaning capacity between the old and new shops was resolved by calculating the operational costs as cost per garment, as shown at the bottom of the cost data table and discussed in the conclusions section.

2.5.1. One Time Investment Costs

The cost of the 4 DaeWoo wet cleaning machines was \$950 each and the cost for the dryer was \$3,000. Recall that the cleaner moved to a new shop location that previously did not have any cleaning operations on site. Thus, new pressing equipment as well as plumbing, electrical and boiler systems had to be put in place. Installation costs for this shop were very high because of the plumbing, boiler room and electrical work. These costs were estimated to be \$9,600 for plumbing, \$8,000 for the boiler room, and \$2,400 for electrical. An additional \$1,700

² The cleaner presently does not charge an extra fee for wet cleaned wool suits.

of installation costs also were incurred for the pressing equipment and other shop items. Note that this total of \$21,000 in general installation costs would be the same for a perc machine or for the current wet clean machines.

For the perc dry cleaning column in the following table, the price to buy a new perc machine is listed at \$35,000 to \$40,000. For the purposes of this case study the lower cost of \$35,000 is used. The costs for the wet cleaning pressing equipment were \$12,000 for the pants presser and \$7,000 for the form finisher. Both of these machines apply tension and steam to garments, which reduced the cleaner's pressing time on wet cleaned garments. Equivalent pressing equipment for perc dry cleaning amounts to \$10,500 for a pants toppler and legger presses and \$3,000 for a form finisher.³ The cost of the spotting board was assumed to be the same for either wet cleaning or dry cleaning.

The remaining one time investment costs for the compressor, boiler system and installation are identical whether wet cleaning or perc dry cleaning are used, since the cleaner would need this equipment to run either type of shop. Note that the owner would not have been faced with high installation costs for a concrete slab if he chose a perc machine for the new shop since it already had a concrete floor.

2.5.2. Annual Operating Costs

All the annual operating costs for wet cleaning are estimated by the cleaner and are based on 1996 operations at Utopia. The annual operating costs for perc dry cleaning are based on operations of the former Utopia shop in 1995, when perc dry cleaning was performed with a third generation closed loop machine. The two shops are in the same neighborhood so the operating costs for electricity and wastewater should be comparable. However, as previously noted, the number of garments currently wet cleaned at the new Utopia is much lower than the number of garments dry cleaned at the old Utopia.

Labor to run the shop is the largest operational cost. The owner continues to work long hours, between 60 hours and 80 hours per week. He works this much at the current wet cleaning Utopia and worked the same hours when he ran the perc dry cleaning machine at the former Utopia shop. The counter at Utopia is presently run by the owner and his wife. His wife works roughly 20 hours per week and a rate of \$7 per hour was used in the following table, even though she does not currently receive a salary. The owner works behind the counter for the remaining time the shop is open and his time is included in the 60 to 80 hour per week estimate. At the former perc dry cleaning Utopia, two counter people worked part time totaling 30 hours per week. The same \$7 hourly rate was used.

The labor time per garment for pressing wet cleaned garments is higher than the pressing time required for dry cleaned garments. The owner estimates that it takes roughly an additional hour for each 100 garments wet cleaned than dry cleaned. Based on current wet cleaning

³ Quotes taken from Forenta and are based on the list price of their economy model pressing equipment. The higher end model of pant presser has a list price of \$14,500. For the cost analysis, the economy style models were assumed.

operations, total required pressing time is 45 hours per week at a rate of \$13 per hour. For the 750 garments cleaned over a six day work week, this equates to approximately 16 or 17 garments an hour.⁴ For the dry cleaning comparison, which was pressing 1,350 garments per week, the costs for pressing are based on a rate of 20 garments per hour. This amounts to a required total pressing time of 68 hours each week at the same \$13 hourly rate.

Water and wastewater costs are currently paid on the same bill. Dry cleaning required higher water and wastewater costs because the former Utopia shop did not have a water tower. Water towers are used to recycle cooling water for solvent reclamation in the perc dry cleaning process. Without a water tower, operation of the closed-loop perc machine at the former Utopia required significant quantities of water during the solvent reclamation process. The DaeWoo machines use between 0.8 and 3 gallons of water per pound of clothing.⁵ Thus, even though water is used as the primary solvent at Utopia, the cleaner paid higher water bills when he used a perc machine because he could not install a water tower on his roof.

Electricity costs are also lower for wet cleaning. The higher electricity cost for the perc machine is attributed to the use of a refrigerated condenser and the fact that the former Utopia was cleaning a larger number of garments. The difference in gas and oil costs between wet cleaning and dry cleaning are not directly comparable since the two shops have different boilers and run on different fuel. However, the cleaner estimates that the total costs to run the boiler whether doing wet cleaning or dry cleaning would be roughly equal with his equipment. He noted that wet cleaning uses more steam but that a perc machine requires more heat for the drying cycle compared to the heat required for the dryer used in wet cleaning. In his opinion, these heat requirements would roughly cancel each other out.

Switching to all wet cleaning in this shop has completely eliminated the costs associated with the purchase of new filters and the disposal of spent filters as hazardous waste. In addition, the cleaner does not have to spend time filling out the necessary paperwork associated with perc regulations for this shop.

Finally, the last costs in the table reflect the costs for soaps, detergents, solvents and hazardous waste disposal associated with wet cleaning and dry cleaning. These costs were based on estimates made by the cleaner.

2.6. Conclusions

The choice to use 100% wet cleaning at Utopia offered the cleaner significant savings in one time investment costs to open the shop. The capital costs of \$82,700 for dry cleaning equipment is 38% higher than the \$60,000 needed to fully equip a wet cleaning facility on the same site. A large portion of this difference can be accounted for by the higher purchase price of

⁴ The cleaner stresses that his old pressing equipment allowed for only 12 wet cleaned garments an hour per presser. The new pressing equipment, which he bought specifically with wet cleaning in mind, increases the rate to between 16 and 17 garments an hour.

⁵ Larger wet cleaning machines can use between 4 to 6 gallons of water per pound of clothes.

a new perc machine compared to the cost of the four DaeWoo washers and industrial dryer needed for wet cleaning.

From an operating standpoint, the former perc dry cleaning Utopia had higher total annual operating costs in 1995 than the present 100% wet cleaning Utopia had in 1996. However, when you compare the amount of clothing that each facility cleaned, the former perc dry cleaning Utopia has slightly lower operating costs of \$1.06 per garment compared to \$1.18 per garment for the current 100% wet cleaning Utopia. This amounts to an 11% increase in annual operating costs per garment cleaned for the wet cleaning Utopia compared to the former perc dry cleaning Utopia.

It should be stressed that the annual operating cost per garment cleaned is highly sensitive to the estimate of the number of garments cleaned. The cleaner's estimate of garments at the 100% wet cleaning Utopia in 1996 is more accurate than his estimate of the number cleaned in 1995 simply because data for this case study were gathered towards the end of 1996. The cleaner was more confident in his estimate for 1996 clothing throughput in his current shop compared to estimating his 1995 throughput. For the former perc dry cleaning Utopia, 11% amounts to 25 garments a day and is within the margin of error of the cleaner's estimate of clothing received at the former perc dry cleaning Utopia in 1995.⁶

For this cleaner, the operating cost per garment cleaned for wet cleaning is equivalent or slightly more than the operating cost per garment cleaned at the former perc dry cleaning Utopia. In establishing the new Utopia, however, the cleaner saved over \$20,000 or 1/3 of his total one time investment by choosing to establish a 100% wet cleaning facility.

⁶ In 1995, an estimated 250 to 300 total garments per day entered into the former perc dry cleaning Utopia facility. This volume came in 6 days per week, which totals to 1500 to 1800 garments per week. Of this total, between 200 to 400 per week were wet cleaned. This study assumed the midpoint of both ranges. Using the midrange amounts to a total of 1650 garments coming into both shops each week (275 garments per day for 6 days a week) with 300 garments per week wet cleaned. Thus a total of 1350 per week were perc dry cleaned. Using the lower estimate of 1500 garments total per week would mean 1,200 garments were perc dry cleaned each week (60,000 per year) and the cost per garment for perc dry cleaned garments at the former Utopia would equal \$1.19 compared to the \$1.18 for the 1996 wet cleaning Utopia.

UTOPIA CLEANERS: Comparison of Costs for the new Utopia wet cleaning facility as compared to an equivalent perc facility at the same site.

LINE ITEM OF COSTS	Wet Clean Only (based on '96 data)	Dry Clean (based on '95/96 data)
Total Garments Cleaned (per year)	37,500	67,500
ONE TIME INVESTMENT COSTS	(based on actual costs at new shop)	(based on vendor estimates)
Closed Loop Dry Clean Machine	NA	\$35,000
Wet Clean Machines	\$3,800	NA
Industrial-Sized Dryer	\$3,000	NA
Pant Presser	\$12,000	\$10,500
Form Finisher (Suzi)	\$7,000	\$3,000
Spotting Board	\$1,500	\$1,500
Compressor	\$1,000	\$1,000
Boiler System	\$10,000	\$10,000
Installation (plumbing, electrical and boiler room)	\$21,700	\$21,700
Sub Total One Time Costs	\$60,000	\$82,700
ANNUAL OPERATING COSTS	(based on '96 data from new shop)	(based on '95 data from old shop)
Labor		
Counter People	\$7,000	\$10,500
Pressers	\$29,200	\$44,200
Owner	60-80 hrs/week	60-80 hrs/week
Utilities		
Water/Wastewater	\$1,000	\$3,000
Electricity	\$1,800	\$4,800
Gas	\$3,600	NA
Oil	NA	\$4,200
Filters and Cleaning Agents		
Purchase of New filters	0	\$400
Disposal of spent filters	0	\$1,800
Soaps/Detergents	\$700	\$300
Perc	NA	\$1,400
Spotting Agents	\$1,000	\$1,000
Sub Total Annual Operating Costs	\$44,300	\$71,600
Annual Operating Cost per Garment	\$1.18	\$1.06

3. PARTIAL CONVERSION FROM PERC DRY-CLEANING TO HIGH TECHNOLOGY WET CLEANING - CASE STUDY

This case study describes a dry cleaner that converted its cleaning operations from mostly perchloroethylene (perc) dry cleaning to a mixture of high-tech wet cleaning and perc dry cleaning. It compares the operations and costs to run a shop with one dry cleaning machine to running the same shop with the same dry cleaning machine and a new wet clean machine. The single dry cleaning machine could not handle the volume of garments coming through the shop, forcing the owner to work long hours. The limitation in capacity also caused significant "down time" for the pressers as they waited for cleaned clothing to press. A second machine was needed to maintain business operations by allowing the same amount of clothing to be cleaned much faster. Please note that "dry cleaning" refers to perc dry cleaning machines in this case study.

3.1. Background Information

The owners of the dry cleaning shop, a married couple, are relatively new to the fabricare industry. In early 1994, they purchased a drop-off site. The husband kept his job in another field while the wife ran the drop-off site. Initially, clothing collected at the drop-off site was sent to a local wholesale dry cleaner, which charged a fee for each garment received from the drop-off site. After one year, however, the owners decided it would be more profitable to clean the garments themselves. The owners subsequently purchased a fully operational facility that provided them with the equipment to dry clean garments in perc. In addition to clothing from the drop-off site, the new facility also collected clothing over the counter. Combining the drop-site and the shop, the facility received approximately 500 to 700 shirts/week and 2500 to 3500 pounds of other garments. The new shop was operated by hired employees until August 1995. At that time, the husband took the final plunge into dry cleaning, quit his previous job, and started running the shop full time. Although the owners had little knowledge about dry cleaning, the head presser at the shop had extensive experience.

3.2. Initial Dry Cleaning Operation

The purchased shop came fully equipped with a third generation, 35 pound closed loop dry to dry machine, a uni-wash shirt washer, a conventional household washer and dryer, and finishing equipment (2 utility presses, a pants topper, 2 form finishers (suzis), a legger and three shirt pressing machines). All dress shirts and cotton comforters were washed in the shirt washer. Of the remaining clothing, 85% to 90% was dry cleaned while 10% to 15% was cleaned in the conventional washer and dryer. This smaller portion, consisting of cotton sweaters and extensively soiled washable garments, required careful monitoring of the drying cycle to avoid shrinkage and resulted in damp garments hanging throughout the shop to air dry. The owner chose to clean these items in the conventional washer and dryer because, in his opinion, water would clean them better than perc.

The cycle time of the 35 pound dry cleaning machine is approximately 45 minutes per load. Given the amount of clothing coming over the two counters (the cleaning shop and the drop-off site), the machine could not keep pace with the two full-time pressers who finished the garments. Consequently, the owner had to work until 7 or 8 p.m. each evening to clean the required amount of garments and to ensure that a back-load of garments were ready for his pressers when they arrived the next morning. Even with this back-load, the pressers, who start work at 6:30 in the morning, would catch up to the perc machine by noon. Thus, for the last two and a half hours of their work-day, the pressers were frequently left idle while waiting for freshly cleaned garments to press. If the owner was unable to stay late at night, the pressers would catch up to the machine at 10:30 a.m., leaving five hours of their work-day with frequent down-time.

In order to meet customer needs under this system, two full time garment pressers worked 40 hours per week, an additional shirt presser worked 40 hours per week, three counter people each worked 35 hours per week and the owner worked 10 to 12 hour days, six days per week.

It became clear that an additional cleaning machine was needed, both to increase labor efficiency and to relieve the burden of long work days on the owner. The owners initially decided to purchase a fourth generation, 45 pound dry to dry perc machine. After the machine was selected, the equipment dealer quoted the cost of installation to be roughly \$15,000. This cost included: 1) the installation of a concrete slab to support the new dry clean machine; 2) the removal and subsequent replacement of large glass windows to bring the machine into the shop (its size prohibited it from coming through any doorways); 3) the removal and subsequent replacement of overhead clothing racks to allow transport of the large machine to the back of the shop; and 4) the raising of the steam header pipes that ran across the ceiling, to accommodate the tall machine. The \$15,000 cost was roughly broken down to include \$8,000 for the concrete floor and \$7,000 for the other three installation activities.

As an alternative to the fourth generation dry to dry machine, the equipment dealer suggested a wet cleaning machine that was comparable in purchase price but small enough to fit through the door and would not require a concrete slab. Seeking to avoid the high installation costs associated with the dry cleaning machine, the owners decided to investigate wet cleaning further.

3.3. Adding Wet cleaning Technology to The Shop

In addition to low installation costs, other potential advantages of wet cleaning appealed to the owners. First, there would be potential operational cost savings. By wet cleaning a significant portion of garments that were currently dry cleaned, the owners would use their dry cleaning machine less often. Decreasing the use of the dry cleaning machine would result in decreased use of the materials needed to operate it, including perc, new filters, and the disposal of spent filters. A second potential advantage would be partial alleviation of current or future regulatory requirements. According to regulations, a perc cleaner may change his or her shop's regulated category status from a higher category (tougher requirements) to a lower category (easier requirements) by using less perc. Finally, the addition of wet cleaning to the shop offered

greater operational flexibility, by allowing heavily soiled clothing to be wet cleaned without extensive spotting while wool and other delicate fabrics could still be dry cleaned.

Concerns with wet cleaning centered around potential shrinkage of clothing and the greater amount of effort required to identify and separate garments for the two cleaning processes. In addition, there was a perceptual barrier associated with the adoption of an unfamiliar technology to clean a larger portion of the shops throughput. Several of the owner's colleagues, who have been in the fabricare industry for 20 or more years, discouraged the use of wet cleaning technology. In the owner's words, "most people I knew in the industry thought we were absolutely crazy to consider expanding capacity with wet cleaning over dry cleaning". However, the potential advantages of wet cleaning led the owners to continue looking into wet cleaning as an option for their shop.

The owners did their homework by speaking with wet cleaning equipment suppliers and visiting the Greener Cleaner demonstration shop in Chicago to see first hand how the technology works.⁷ Since the Greener Cleaner performs 100 percent wet cleaning, the owners were able to witness all types of garments, including wool and rayon, being cleaned by the wet cleaning process and the appearance of these garments after wet cleaning.

Based on the potential advantages of wet cleaning and the knowledge acquired during their research, the owners ultimately canceled the order for the fourth generation, 45 pound closed loop perc machine. Instead, they chose to expand their capacity with a 50 pound wet cleaning system, consisting of a fully automated wet cleaning washer and dryer. The owners made this decision with the following intentions:

- Wet cleaning would compliment the perc cleaning, not replace it. One hundred percent wet cleaning was never the goal.
- In general, all cottons and silks would be processed in the wet cleaning equipment while wool and rayon would be dry cleaned. Having such control over the operations would reduce potential shrinkage.
- The existing finishing equipment would be used for both dry cleaned and wet cleaned clothing.

The owners believe that their status as beginners in the industry may have made it easier for them to adopt wet cleaning technology. They were not experienced spotters so water based stains on garments cleaned in a perc machine were labor intensive and the garments often needed multiple cleanings. Wet cleaning would be able to handle many of these stains with minimal spotting. They also did not have many of the cleaning habits formed through many years of using perc machines nor did they have any perception that one technology is inherently superior to the other. In short, they witnessed a technology that worked, met their needs, provided operational flexibility, and appeared economically attractive. With these advantages and the knowledge that

⁷ The Greener Cleaner is a pilot project sponsored by the U.S. Environmental Protection Agency that has committed to 100 % wet-cleaning.

they would still have perc cleaning capacity, the decision to switch some of their operations to wet cleaning was a comfortable one.

3.4. The Current Process - Combination of Wet Cleaning and Dry Cleaning

The wet cleaning washer and dryer have been in place since September, 1995. Forty to fifty percent of the shop's clothing is now wet cleaned with the remainder being dry cleaned. Shirts continue to be laundered in the Uni-washer. The rule of thumb at this shop is that cotton and silks are wet cleaned while wool and rayon garments are dry cleaned. As with any rule there are exceptions; wool and rayon are sometimes wet cleaned. For instance, five pairs of wool pants from a flooded home basement were wet cleaned and came out clean with no shrinkage. The customer had previously taken them to several other shops and none of the dry cleaners would touch them. The owners noted that instances such as these raised their comfort level with the types of clothing that can be wet cleaned.

Separation of clothing to be dry cleaned remains the same (garments are separated at the machine by color) while separation of clothing for wet cleaning requires an additional step – they are first separated by fabric type and then by color.

The wet cleaning washer and steam-heated dryer are completely automated. The owners have created their own processing programs in addition to the ones supplied by the manufacturer. The major benefit to automation is that the dryer monitors air moisture content to prevent shrinkage that could be caused by over-drying. The amount of time for washing varies with the type and amount of clothing placed in the machine. In general, the owner will clean up to 45 pounds of cotton sweaters and casual men's slacks (such as Dockers), which take approximately 40 to 45 minutes to wash. For delicate fabrics, only 20 to 30 pounds are placed in the machine, for a wash time of approximately 30 minutes. The drying times also vary from 20 to 30 minutes for the heavy cottons and 10 to 15 minutes on silks and sweaters. Depending on what is coming over the counter, the shop does six to ten wet cleaning loads and five to seven dry cleaning loads per day.

In the first six months of operation, there was only one customer claim on a wet cleaned garment that shrunk. According to the shop owner, the reason for the garment damage was a mis-labeled garment (it was an angora mix). Since then, the owners inspect the fabric directly in addition to checking the manufacturers' labels to determine if a garment will be wet cleaned or dry cleaned. Also, any suspect garment, typically 5 to 7 per week, is measured prior to being wet cleaned. The low number of claims and the low number of garments that the owners measure reflect the operational flexibility of dry cleaning when there is doubt to a garments' fabric content. For instance, if the fabric content is unknown or the garment appears susceptible to shrinkage, the owner will dry clean. The dry cleaners also noted their increased experience, both with wet cleaning and dry cleaning, as a major contributor to their low claims. On dry cleaned items, the cleaner averages about two to three items per quarter.

The same finishing equipment is used for both wet cleaned and dry cleaned clothing. Occasionally, the owner will need to stretch wet cleaned garments by applying steam from the utility press. This is only needed on one or two garments each month. The owner did comment that better finishing equipment would probably be required if he went to 100 percent wet cleaning, or if he started wet cleaning high-end clothing, such as men's suits.

The ease of running the shop has noticeably improved since the wet cleaning machine has been installed. Spotting time has decreased because the owner is able to wet clean garments with heavy dirt and other water-based stains while dry cleaning garments with oil-based stains. In fact, some garments such as construction jackets with grass, dirt, and grease, are both wet and dry cleaned. It is important to note that decreased spotting time and greater operational flexibility is attributed to the fact that the owner has both wet and dry cleaning technology. The choice of cleaning depends on the stain and the garment.

Because the owner uses the perc machine less, he does not need to distill solvent or change the filters as often. Also, the probability of garments bleeding in perc has been greatly reduced. Clothing that bleeds in perc is especially problematic for dry cleaning machines because the bleeding can contaminate the perc if it is not discovered in time. The owner now throws clothing suspected of bleeding into the wet cleaning machine by themselves or with similar color clothing so that if it bleeds, colored water simply goes into the sewer rather than contaminating the perc supply. Another noted improvement concerns garments with plastic beads or buttons, which are less likely to melt onto the fabric when wet cleaned than when dry cleaned. Wedding dresses are particularly well suited for wet cleaning. In addition to delicate beads and buttons, wet cleaning works extremely well on the dirt ring that usually accumulates on the train of the dress. Spotting wedding dresses for dry cleaning was quite difficult and dresses sometimes required several dry cleaning cycles.

The owners have significantly reduced their perc usage from 200 to 250 gallons a year to roughly 100 to 120 gallons a year. The economic benefits from this reduction, both in perc purchasing and waste management, are detailed in the next section. Perc use reduction has also allowed the dry cleaner to drop from being regulated under federal air regulations as a Large Area Dry Cleaner to a Small Area Dry Cleaner. Although the cleaner was in compliance with the Large Area air control requirements, he sees benefits in going down to the Small Area category. By using less perc he believes he will be viewed in a more favorable light by the federal Environmental Protection Agency and state and local environmental agencies.

Overall, the owners are confident they made the right choice in selecting wet cleaning technology to expand their operations. They are satisfied with the quality, enjoy the flexibility, and feel it was a cost-effective solution (see below). The owners were quick to note that one reason it works so well for them is because the mix of clothing coming over the counter lends itself to wet cleaning. In this case, there is a mixture of soiled blue collar work clothes, casual dress clothes, and suits or high end dress clothes. The owner has noticed an increasing volume of casual clothing such as Dockers men's pants and cotton sweaters that are well suited for wet cleaning. The garment mix at this cleaning shop is roughly 1/3 high end clothing such as suits, and 2/3 casual dress clothes most suitable for wet cleaning.

To date, the owners have not specifically marketed the wet clean technology to customers who walk in their shop but if someone inquires, they will explain the process. The owners currently do not charge different prices for clothing that is wet cleaned or double cleaned. Several customers have mentioned that their clothing smells fresher, particularly cotton sweaters.

3.5. Discussion of Costs

The table on the following page gives line item costs for the three options the cleaner in this study investigated:

Option 1 - Do nothing. Under this option the cleaner continues to operate one machine but incurs higher operating costs and works overtime. All costs are based on actual operation before the cleaner purchased a second machine.

Option 2 - Increase Capacity with a Wet Cleaning Machine. This is the current situation. Costs are based on actual investment and operating costs for the shop as it is now set up.

Option 3 - Increase Capacity with a Second Perc Machine This scenario estimates what the costs would have been if the cleaner bought a second perc machine instead of a wet cleaning machine. The one time investment costs are based on actual quotes the cleaner received.⁸ The operating costs for the owners shop with two perc machines are best estimates based on current costs from the middle column (option 2) and past costs from the first column (option 1).

Annual operating costs under the three options can vary significantly. For labor, the addition of a second machine of either kind offered savings for garment presser labor and for the hours worked each week by the cleaner. When only one machine was in the shop, two pressers worked 40 hours a week. As mentioned earlier, the pressers were frequently waiting for garments to be cleaned. With two cleaning machines, the pressers are kept busy for their entire shift but their total shift hours have been reduced to 35 hours per week. Note that the same number of garments are pressed – the reduction in hours is due to the fact that the pressers have no down time when they are waiting for garments. These savings in presser labor hours apply to the current wet cleaning machine and it assumed they would also apply if a perc dry cleaning machine had been purchased.

The addition of a second machine also allows the owner to clean two loads of garments at the same time and has reduced his total time by 10 and 20 hours each week. Since the owner does not take a salary, actual hour estimates were used for the analysis. The savings in the owner's labor would also occur if the second machine was a perc machine. The other two categories of labor costs, counter people and shirt pressers, remained constant. Neither cost is affected by the addition of a second cleaning machine.

⁸ The cleaner received quotes in the range of \$30,000 to \$35,000. As shown in the table, the lower value was used for the cost analysis.

Utility costs also have changed with the addition of a wet clean machine. Water costs have risen due to washing with the wet cleaning machine. The \$900 under Options 1 and 3 represent water used for laundering shirts and general shop operations. Electricity at the shop is used predominantly for the boiler, which is used during the drying cycle for the perc machine. When only one machine was used, the owner estimated the yearly cost to be between \$5,400 and \$5,700. A value of \$5,500 was used in the analysis. By cleaning roughly half of the garments coming into his shop with wet cleaning, the owner has reduced his electricity costs to \$4,800 per year. It takes less electricity to run the steam dryer than it does to dry perc in a perc machine. For Option 3, the electricity costs were assumed to be the same as those for Option 1 since the volume of clothing has not changed.

Natural gas at the owner's shop is used for general shop operations such as building heat. Because the owner can now close down the shop earlier, he has seen a reduction in his gas bill from \$5,000 to \$4,200. The primary reason the shop was operating much longer under Option 1 was because one machine had to clean all the garments coming into his shop. Note that the savings in gas are realized whether a second perc machine or a wet cleaning machine is added to the shop.

The final group of costs relate to the cost of perc. By reducing the amount of perc used in the shop, the owner has noticed a reduction in the amount he spends on purchasing perc and on the costs for disposal of perc filters. For Option 3 (where two perc machines are assumed), the costs would be identical to Option 1 since the same volume of garments are cleaned.

3.6. Conclusion

As the costs on the following table show, the addition of either a wet cleaning machine or a second perc machine offers reduced operating costs to the cleaner and reduces his time by ten to twenty hours each week. Option 2, the addition of wet cleaning, has slightly less expensive annual operating costs compared to the annual operating costs associated with a second perc machine. The difference in annual operating costs is roughly 2%, or \$2,000. The real savings for this cleaner is in the reduced one-time investment costs. The cost for a wet cleaning machine with installation is \$12,000 less than a second perc machine. Thus, the cleaner would have paid 36% more in one-time investment costs if he chose a second perc machine.

In addition to the reduced hours the cleaner now spends in the shop, the wet cleaning option offers several other distinct advantages over the purchase of a second perc machine. First is the operational flexibility that having both perc dry cleaning and wet cleaning offer. Second is the comfort-level the cleaner has in meeting current and future regulatory requirements. Finally, the cleaner does not have to drain his machine and replace the filters as often since less clothing is dry cleaned. Previously, he had to come in for five hours on Sunday two time a month to clean the machine because he could not afford any down time during the week. Now he has his Sunday's free to spend with his family. Although these items are not quantified in the dollar figures in the table, they were quick to be noted by the cleaner.

COMPARISON OF COSTS

LINE ITEM OF COSTS	Option 1 One Machine	Option 2 Two Machines	Option 3 Two Machines
	Existing Dry Cleaning Machine	Existing Dry Cleaning plus Wet Cleaning	Two Dry Cleaning Machines
One-time investment costs			
Wet Clean Machine	NA	\$33,000	NA
Dry Clean Machine	NA	NA	\$30,000
Installation	NA	\$0	\$15,000
Start-up/Training	NA	negligible	negligible
Sub-Total One time costs	NA	\$33,000	\$45,000
Annual Operating Costs			
Labor			
Counter staff	\$34,125	\$34,125	\$34,125
Garment pressers	\$33,280	\$29,120	\$29,120
Shirt pressers	\$16,640	\$16,640	\$16,640
Owner	70 hrs/week	50-60 hrs/week	50-60 hrs/week
Utilities			
Water/Wastewater	\$900	\$1,200	\$900
Electricity	\$5,500	\$4,800	\$5,500
Gas	\$5,000	\$4,200	\$4,200
Filters			
Purchase of New filters	\$2,376	\$1,188	\$2,376
Disposal of spent filters	\$4,200	\$2,100	\$4,200
Cleaning Agents			
Aqua-clean detergents	NA	\$2,400	NA
Perc	\$1,100	\$550	\$1,100
Sub-Total Annual Operating Costs	\$103,121	\$96,323	\$98,161

4. FINANCIAL ANALYSIS WORKSHEETS - INSTRUCTIONS AND EXAMPLE

Any modification to your current cleaning process—either the purchase of more efficient dry cleaning equipment or changes in housekeeping practices—has a financial impact on your business. You need to recognize this financial impact so that you can manage your business wisely. Often, pollution prevention (P2) investments and process changes can save you money because they improve your solvent mileage and reduce your legal environmental liability.

In some cases, a cleaner knows exactly what type of equipment he or she wants. In other cases, a cleaner may be choosing between different types of equipment, e.g., between perc equipment and high-tech wet cleaning equipment. These worksheets can be used to assess the financial impact of either type of investment decision. In addition, they can be used to assess the impact of operational decisions that do not require an up-front equipment purchase, e.g., a change in housekeeping practices such as frequency of machine maintenance.

You can use the financial analysis worksheets in this document to assess both dry cleaning and wet cleaning improvements to your current operations. These worksheets will assist you in identifying costs and savings relevant to a purchase you have in mind and in organizing the cost information itself. The worksheets contain several sections that allow you to decide how much time you want to spend evaluating your investment:

- Step 1 - Cost Checklists
- Step 2 - Estimate Your Up-Front Costs
- Step 3 - Estimate Your Annual Costs and Savings
- Step 4 - Estimate the Change in Your Cash Flow

For example, if you have very limited time you can use the *Cost Checklists* alone, i.e., as simple checklists to identify the up-front costs of your investment and the potential annual operating costs that might change as a result of your investment. If you want a more accurate analysis, you can collect actual cost information from your shop records and your equipment vendor to fill out the dollar estimates on the *Cost Checklists*.

If you do decide to make actual dollar estimates for the *Cost Checklists*, you then can use *Steps 2 - 4* of the worksheets. These quantitative steps walk you through a financial analysis of your investment, building from the information entered in the *Cost Checklists*. In *Step 2*, you summarize the upfront costs for the investment. In *Step 3*, you summarize how the investment will change your annual operating costs and revenues. In *Step 4*, you combine the upfront costs with the changes in annual operating costs and revenues to calculate the approximate impact of the investment on the taxes you pay and the cash flow of your shop.

If you wish, you can complete only *Step 2* and *Step 3* and make your decision based on your upfront costs and expected annual savings, without spending the time to complete *Step 4*. Whatever level of analysis you choose, the worksheets will help you rationalize your investment decision-making, making your shop more profitable in the long-run.

If you are fairly comfortable with the basic concepts of financial analysis and with the use of computer spreadsheets, you could consider using the *P2/FINANCE Software System*, a spreadsheet computer program that will perform the financial analysis calculations for you. This software is currently available from EPA *at no charge* and can be obtained from the Pollution Prevention Information Clearinghouse by calling 202-260-1023.

When you are ready to use the worksheets, begin your analysis by making a copy of the blank worksheets attached at the end of this document, keeping the original blank worksheets for making more copies in the future, for yourself or for other cleaners you know. Write the name of your investment project and the date at the top of each page.

4.1. Step 1 - Cost Checklists

The worksheets contain two checklists: one for *Up-Front Investment Costs* and one for *Annual Operating Costs*. Up-front investment costs are the costs necessary to make your equipment upgrade or purchase new equipment. Up-front costs also include items such as equipment installation, permitting, equipment start-up, and employees training. Annual operating costs are any continuing costs necessary to keep your shop running, and include many items such as cleaning supplies, clothes handling supplies, labor and supervision, utilities, maintenance and waste management, waste storage, hauling, and disposal, liability and insurance, advertising materials, off-site services such as laundering, and claims.

The *Cost Checklists* contain detailed lists of potential up-front costs and annual operating costs for a perc or wet cleaning operation. You can use these checklists in several different ways. First of all, you could use them simply to make sure that you think about and identify all of the up-front investment costs relevant to the investment you are considering. This can help you prevent the discovery of any "surprise" up-front costs at the last minute, for example, during the installation or start-up of your new equipment. If you want to use the checklists in this simple way, just put check marks in the far left column of the *Up-Front Investment Cost Checklist*; this is illustrated on the example worksheets for the Smart Look case study, which are entitled "Partial Conversion to Wet Cleaning." If you are assessing the potential impact of a change in operational practices such as housekeeping rather than the purchase of actual equipment, you may not have to use the *Up-Front Investment Cost Checklist* at all.

It is also very important to know what effect your potential investment will have on the annual operating costs of your shop. Will your utility costs increase? Will your perc purchase and disposal costs decrease? What will be the overall effect on your shop's cash flows? Use the *Annual Operating Cost Checklist* to help identify the various annual costs that might decrease or increase as a result of your investment. Instead of using check marks to the left of those costs that might change, use up and down arrows to show whether you expect that cost to increase or decrease. This will give you a qualitative feel for how your shop's cash flows might be affected by your investment.

The detailed lists of potential costs and savings in the checklists will help to make sure that you do not forget to consider important items that can affect the profitability of your business. However, although these cost lists are fairly comprehensive, you will likely want to add new items specific to your shop or the particular investment; there is space for you to add such items onto the checklists.

An even better way to use the *Up-Front Investment Cost Checklist* and the *Annual Operating Cost Checklist* is to record actual dollar estimates for the various cost items. The cost information you need could come from your shop records, your own memory, your equipment vendor, or your lender or lease agent. The use of cost data on the checklists is discussed in more detail in the following sections.

4.2. Step 2 - Estimate Your Up-Front Costs

The best way to understand the potential impact of an investment on your shop is to estimate the actual dollar costs and savings due to the investment. For example, you might want to shop around for the best price and financing deal on a piece of equipment you want to purchase. *Step 2* of the financial analysis worksheets helps you to record the up-front costs of your investment, information that you collect from your equipment vendor and your lender or lease agent.

In *Step 1*, you used the *Up-Front Investment Cost Checklist* to identify the potential up-front investments costs of your investment. Your equipment vendor also should be able to help you include all of the relevant items. Once you identify the relevant equipment items, you can ask your vendor or lender or lease agent for a purchase financing quote. Begin by noting which equipment items are included in the financing quote(s) on the *Up-Front Investment Cost Checklist*, as illustrated in the Smart Look example. You should NOT record the actual loan or lease cost quote on the *Up-Front Investment Cost Checklist*, as it will be included later on the *Step 2* worksheet.

If there are up-front costs that are NOT covered by your financing package (e.g., the cost to obtain a permit for a new perc machine), record these extra up-front costs on the *Up-Front Investment Cost Checklist*. For each investment cost category, you can add up these extra up-front costs and enter the sum in the shaded subtotal box at the bottom right corner of the category.

Now you are ready to summarize your up-front cost information on the *Step 2* worksheet. Based on the type(s) of financing that you are considering, complete either the Loan Worksheet box or the Lease Worksheet box. If you expect to take out a bank loan to pay for the equipment, record the duration of the loan, the interest rate, and the annual loan payment (including principal and interest). If you expect to lease the equipment, record the duration of the lease, the buy-out price at the end of the lease (if applicable), and your annual lease payment. In either case, your financing quote should provide this information.

Note: If your loan or lease covers general expenses as well as the purchase of new equipment, only include the portion of the financing related to the investment under consideration. For example, if the loan covers the purchase of a 4th generation dry cleaning machine and provides the business with general operating funds to tide the shop over during a slow spell, estimate the amount of the loan related to the new equipment and only include that amount in Step 2.

In addition to information on the financing parameters for the investment, include other up-front investment costs relevant to the investment that are not included in your lease or loan payment on the *Step 2* worksheet. You have already recorded estimates for these extra up-front costs on the *Up-Front Investment Cost Checklist*. Simply sum up the shaded subtotals and enter the total amount on the *Step 2* worksheet.

4.3. Step 3 - Estimate Your Annual Savings

The *Step 3* worksheet allows you to record the changes in annual operating costs that occur as the result of your investment. Ideally, you should choose equipment or equipment upgrades that lower your annual operating costs, if possible. At a minimum, you should be aware of the impact of your equipment purchase or upgrade choice on your annual operating costs. Will there be an overall increase in costs to run your shop, or some overall annual savings?

In *Step 1*, you used the *Annual Operating Cost Checklist* to identify those annual costs that might change as a result of your investment. Once you have identified the relevant cost increases and decreases by adding up and down arrows to the far left column on the *Annual Operating Cost Checklist*, you can begin to estimate the dollar value of those cost increases and decreases.

Begin by estimating the annual costs for your current shop operations and compare those costs to estimates of the annual costs after the equipment purchase or upgrade. Include cost estimates ONLY for those costs that you expect to change as a result of the investment, not all of your shop's annual costs! If a particular cost will NOT change because of your investment (e.g., your annual purchasing cost for clothes handling supplies), then you do NOT need to consider it.

Obtain annual operating costs for your shop's current operations by reviewing your shop records such as utility bills, purchasing records, and waste disposal bills. You may be able to estimate many labor costs from your own experience running the business. Your equipment vendor can probably assist you in identifying and making dollar estimates for operating costs for the new system you are considering. In many cases, making an exact estimate will be difficult, so you and your vendor should make the best guess that you can based on your experience. You should try to prioritize the cost items you are estimating, i.e., spend the most time estimating those cost items likely to have the most significant impact on your shop.

For each item identified on the *Annual Operating Cost Checklist*, enter the business-as-usual annual operating costs related to your *Current System* and the expected annual operating costs for the *New System* you are considering. Within each cost category (e.g., *Cleaning*

Supplies), sum the costs for both the *Current System* column and the *New System* column and enter each sum as a *Subtotal* at the bottom of the cost category. You can then subtract the annual operating costs associated with the new system from your current annual operating costs to calculate the expected annual savings for your proposed investment. Enter that value in the shaded box at the bottom right corner of the cost category. The Smart Look example illustrates how to record and sum these cost estimates.

Now you are ready to summarize your annual cost and savings information on the *Step 3* worksheet. For each cost category on the *Annual Operating Cost Checklist*, simply copy the *Subtotals* from the shaded box at the bottom right of each category onto the appropriate line of the *Step 3* worksheet. Some of the subtotals you copy may be positive numbers (indicating an annual savings in that cost category) and some may be negative (indicating an annual cost increase in that cost category). On the *Step 3* worksheet, add the *Operating Cost Category Subtotals* together to get the *Total* annual change in operating costs due to the investment.

In some cases, an investment you consider also will affect your shop's annual revenues. For example, addition of a new machine to your shop may allow you to clean more clothing than before, increasing your annual revenues. Estimate any change in annual revenues expected for the investment and enter that value in the *Operating Revenues* box on the *Step 3* worksheet.

You may wish to stop your analysis here at the end of the *Step 3* worksheet. You can use the results of *Step 2* (Up-Front Costs) and *Step 3* (Annual Operating Savings) to assess the investment under consideration without going on to the *Step 4* worksheet. If you are comparing two different potential investments, complete *Steps 1-3* for each option, and compare the results to help in your final decision. However, if you are interested in more details such as the approximate effect of your investment(s) on your tax payments and shop cash flows, proceed to the *Step 4* worksheet.

4.4. Step 4 - Estimate The Change in Your Cashflow

The *Step 4* worksheet walks you through a financial analysis calculation to estimate the impact of the investment on your taxes and the bottom line cash flow of your shop. Depending on your financing package for the potential investment, choose either the *Step 4 Loan Worksheet* or the *Step 4 Lease Worksheet*. Each version of the worksheet requires information on the shop's effective tax rate and the financing of the investment, which you can gather from your accountant, lender, or lease agent.

Each worksheet is divided into two sections: the *Tax Calculation* and the *Cash Flow Calculation*. Instructions on how to calculate the value for each row appear in parentheses. The *Step 4* worksheet allows you to enter cost data for eight years but you should enter data only for those years during which the data are relevant. For example, if the equipment lifetime is six years, then enter cost data for years one through six. Separate instructions for both the *Loan Worksheet* and the *Lease Worksheet* appear below.

Note: In order to simplify the calculations, the Step 4 worksheet does not account for the time value of money through the application of a discount rate. Instead, it directly incorporates the financing parameters into the calculation. Also, the Step 4 worksheet is designed solely to help you make better investment decisions. The financial analysis calculations have been simplified to make the worksheet more user-friendly. Thus, you should NOT use any section of the worksheet to estimate your taxable income or depreciation for tax purposes. Consult an accountant to assist you in calculating your shop's taxes.

4.4.1. Lease Worksheet Instructions

In order to use the *Lease Worksheet*, copy financing and cost information from the *Step 2* and *Step 3* worksheets. In addition, you will need your shop's effective tax rate, which you can obtain from your accountant.

For the Tax Calculation, enter the Total Increase in Revenues (from *Step 3*) on Line 1, followed by the Annual Operating Cost Savings (from *Step 3*) on Line 2. Copy these values for each year of the project's lifetime. For Line 3, add Lines 1 and 2 to calculate the Incremental Operating Savings for the project in each year. Across Line 4, enter the Annual Lease Payment (from *Step 2*) for the duration of the lease. To calculate the Taxable Income for Line 5, subtract Line 4 from Line 3. To calculate the Change in Income Taxes associated with the project for Line 7, multiply the results in Line 5 by the Effective Tax Rate in Line 6.

For the Cash Flow Calculation, copy the Incremental Operating Savings from Line 3, the Change in Income Taxes from Line 7, and the Annual Lease Payment from Line 4 in the Tax Calculation to Lines 8, 9, and 10 respectively. For Line 11, enter the Buy-out Price for the equipment ONLY in the buy-out year (from *Step 2*). For Line 12, enter the Additional One-Time Investment Costs NOT Included in Lease (from *Step 2*). To calculate the After-Tax Cash Flow, subtract the Additional One-Time Investment Costs NOT Included in Lease (Line 12), the Buy-out Price (Line 11), the Annual Equipment Lease Payment (Line 10) and the Change in Income Taxes (Line 9) from the Incremental Operating Savings (Line 8) and enter the value in Line 13. To calculate the Cumulative Cash Flow for the project, simply add the After-Tax Cash Flow to the Cumulative Cash Flow for the previous year.

The year in which the Cumulative Cash Flow becomes positive can be viewed as the financial break-even year for your investment. You also can use the Cumulative Cash Flow as a point of comparison when you are considering multiple investments. By looking at how the Cumulative Cash Flow changes over time, you can make a more informed decision about whether to implement the proposed project.

4.4.2. Loan Worksheet Instructions

In order to use this worksheet, copy financing and cost information from the *Step 2* and *Step 3* worksheets. In addition, you will need three additional pieces of information:

- Your shop's effective tax rate, which you can obtain from your accountant
- The portion of your annual loan payment that relates to interest, which you can obtain from your lender
- The total equipment cost (not including interest from the loan), which you can obtain from your equipment vendor or your lender

Begin by using the *Depreciation Worksheet* box at the bottom of the page. This worksheet box applies straight line depreciation with a half-year convention over a period of seven years, a common depreciation method for dry cleaners. Enter the Total Equipment Cost, including installation and site preparation costs, on Line 1. Then multiply that cost by the Depreciation Percentages entered on Line 2 to calculate the depreciation in each year. For example, if your Total Equipment Cost equals \$10,000, your depreciation in year 5 equals \$1,430 (i.e., $\$10,000 \times 14.3\%$).

Note: The Depreciation Worksheet uses the straight line method with a half-year convention and a depreciation period of seven years for investment analysis purposes only. Do NOT use this Depreciation Worksheet to assist in calculating your shop's taxes; instead consult an accountant to calculate your depreciation for tax purposes.

For the Tax Calculation, enter the Total Increase in Revenues (from *Step 3*) on Line 1, followed by the Annual Operating Cost Savings (from *Step 3*) on Line 2. Copy these values for each year of the project's lifetime. For Line 3, add Lines 1 and 2 to calculate the Incremental Operating Savings for the project in each year. Across Line 4, enter the Equipment Depreciation from the *Depreciation Worksheet* below. For Line 5, enter the Loan Interest Payment for the duration of the loan (you can obtain this value from your lender). To calculate the Taxable Income for Line 6, subtract Line 4 and Line 5 from Line 3. To calculate the Change in Income Taxes associated with the project for Line 8, multiply the results in Line 6 by the Effective Tax Rate in Line 7.

For the Cash Flow Calculation, copy the Incremental Operating Savings from Line 3 and the Change in Income Taxes from Line 8 in the Tax Calculation to Lines 9 and 10 respectively. For Line 11, enter the Annual Loan Payment (from *Step 2*). For Line 12, enter the Additional One-Time Investment Costs NOT Included in Lease (from *Step 2*). To calculate the After-Tax Cash Flow, subtract the Additional One-Time Investment Costs NOT Included in Lease (Line 12), the Annual Loan Payment (Line 11) and the Change in Income Taxes (Line 10) from the Incremental Operating Savings (Line 9) and enter the value in Line 13. To calculate the Cumulative Cash Flow for the project, simply add the After-Tax Cash Flow to the Cumulative Cash Flow for the previous year.

The year in which the Cumulative Cash Flow becomes positive can be viewed as the financial break-even year for your investment. You also can use the Cumulative Cash Flow as a point of comparison when you are considering multiple investments. By looking at how the Cumulative Cash Flow changes over time, you can make a more informed decision about whether to implement the proposed project.

UP-FRONT INVESTMENT COST CHECKLIST

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

Checklist	A. Purchased Equipment (NOT included in loan/lease) (Purchase, Tax, Delivery)	Investment Costs NOT included in loan/lease
	Protective Equipment, e.g., eyewash station	\$
	Solvent Leak Detector	\$
	Perchloroethylene Storage & Handling Materials	\$
	Spill Containment System	\$
	Solvent Filter System	\$
	Steam Cabinets for Steam Stripping Cartridge Filters	\$
	Housing for Draining/Drying Cartridge Filters	\$
	Water Softening Unit	\$
	Water Cooling Unit (Chiller)	\$
	Refrigerated Condenser	\$
	Thermometer for Condenser Coil Temperature Measurements	\$
	Water Separator	\$
	Solvent Filtration/Distillation Unit/Muck Cooker	\$
	Azeotropic Control Devices	\$
	Wastewater Carbon Adsorber	\$
	Wastewater Evaporator	\$
	Other Water Treatment/Recycle System	\$
	Vapor Carbon Adsorbent	\$
	Dry Cleaning Machine	\$
✓	Wet Cleaning System	\$ In Loan
	Domestic Washer and/or Dryer	\$
	Pressing Equipment	\$
		\$
		\$
		\$
		\$
		\$
		\$
	SUBTOTAL	\$

Checklist	B. Construction/Installation (NOT included in loan/lease) (Labor, Supervision, Materials)	Investment Costs NOT included in loan/lease
	Shop Labor & Supervision	\$
	Contractor/Vendor Fees	\$
	Construction Equipment Rental	\$
	Demolition	\$
	Old Equipment/Rubbish Hauling & Disposal	\$
	Plumbing/Piping	\$
	Electrical Systems	\$
	Ventilation/Exhaust Systems	\$
		\$
		\$
		\$
	SUBTOTAL	\$

UP-FRONT INVESTMENT COST CHECKLIST

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

Checklist	C. Permitting (NOT included in loan/lease) (City, County, State, Federal)	Investment Costs NOT included in loan/lease
	Shop Labor & Supervision	\$
	Contractor/Vendor Fees	\$
	City, County, or State Business License	\$
	City or County Health Department Permit	\$
	Perchloroethylene Use Permit	\$
	Wastewater Evaporator Permit	\$
		\$
		\$
		\$
	SUBTOTAL	\$

Checklist	D. Start-up/Training (NOT included in loan/lease) (Labor, Supervision, Materials)	Investment Costs NOT included in loan/lease
	Training in Equipment Operation	\$
	Training in Equipment Maintenance	\$
✓	Training in Dry/Wet Cleaning Techniques	\$ Negligible
	Environmental and Safety Training	\$
	Cleaning Test Runs	\$
	Start-up Supplies	\$
		\$
		\$
		\$
	SUBTOTAL	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

Checklist	A. Cleaning Supplies (Purchase, Delivery, Storage)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
↓	Perchloroethylene (including any taxes)	\$ 1,100	\$ 550	\$
	Detergent for Dry Cleaning Charge	\$	\$	\$
↓	Solvent Filters	\$ 2,376	\$ 1,188	\$
	Solvent Filter Additives	\$	\$	\$
↑	Detergent/Soap for Wet Cleaning	\$ 0	\$ 2,400	\$
	Finisher/Sizer	\$	\$	\$
	Starch	\$	\$	\$
	Water Repellent	\$	\$	\$
	Odor Neutralizer	\$	\$	\$
	Fabric Softener	\$	\$	\$
	Spotting Chemicals	\$	\$	\$
	Spotting Brushes/Bone Scrapers	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$ 3,476	\$ 4,138	\$ -662

Checklist	B. Clothes Handling Supplies (Purchase, Delivery, Storage)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Order Tickets/Receipts	\$	\$	\$
	Garment Tags	\$	\$	\$
	Staples	\$	\$	\$
	Durable Bags/Baskets	\$	\$	\$
	Nets	\$	\$	\$
	Hangers	\$	\$	\$
	Drapery Tubes and Bands	\$	\$	\$
	Safety Pins and Other Clips	\$	\$	\$
	Plastic Garment Bags	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

Checklist	C. Labor and Supervision (Wage or Salary, Fringe Benefits)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
—	Management	\$	\$	\$
	Cleaning	\$	\$	\$
	Spotting	\$	\$	\$
↓	Pressing (garments)	\$ 33,280	\$ 29,120	\$
—	Counter	\$ 34,125	\$ 34,125	\$
	Training	\$	\$	\$
	Advertising	\$	\$	\$
—	Pressing (shirts)	\$ 16,640	\$ 16,640	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$ 84,045	\$ 79,885	\$ 4,160

Checklist	D. Utilities	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
↑	Water (for cleaning, steam generation, cooling)	\$ 900	\$ 1,200	\$
		\$	\$	\$
↓	Electricity	\$ 5,500	\$ 4,800	\$
		\$	\$	\$
↓	Fuel (gas)	\$ 5,000	\$ 4,200	\$
		\$	\$	\$
	Sewer	\$	\$	\$
		\$	\$	\$
	Refrigerant	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$ 11,400	\$ 10,200	\$ 1,200

ANNUAL OPERATING COST CHECKLIST

Project Title: Partial Conversion to Wet Cleaning
Date: 3/11/97

Date: 3/11/97

Checklist	E. Maintenance & Waste Management (Labor & Materials)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Monitoring Perchloroethylene Mileage	\$	\$	\$
	Monitoring Pressure Gauges	\$	\$	\$
	Perchloroethylene Vapor & Liquid Leak Repair	\$	\$	\$
	Cleaning Solvent Storage Tank(s)	\$	\$	\$
	Changing Cartridge Solvent Filters	\$	\$	\$
	Changing Polishing Filters	\$	\$	\$
	Precoating Tubular Solvent Filters	\$	\$	\$
	Regeneration of Tubular/Disc Solvent Filters	\$	\$	\$
	Water Cooling Unit (Chiller) Maintenance	\$	\$	\$
	Condenser Maintenance	\$	\$	\$
	Water Separator Maintenance	\$	\$	\$
	Solvent Still Draining and Cleaning	\$	\$	\$
	Muck Cooker Draining and Cleaning	\$	\$	\$
	Replacing Wastewater Carbon Adsorber Filters	\$	\$	\$
	Wastewater Evaporator Maintenance	\$	\$	\$
	Wastewater Treatment/Recycle Unit Maintenance	\$	\$	\$
	Replacing Vapor Carbon Adsorbers Filters	\$	\$	\$
	Cleaning Button Trap	\$	\$	\$
	Cleaning Lint Trap	\$	\$	\$
	Other Cleaning Machine Maintenance	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

Checklist	F. Waste Storage, Hauling & Disposal (Labor, Supervision, Materials)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Perchloroethylene	\$	\$	\$
↓	Used Solvent Filters & Prefilters	\$ 4,200	\$ 2,100	\$
	Spent Carbon from Vapor/Wastewater Adsorbers	\$	\$	\$
	Filter Muck	\$	\$	\$
	Muck Cooker Residue	\$	\$	\$
	Solvent Still Sludge	\$	\$	\$
	Water Separator Wastewater	\$	\$	\$
	Water Treatment/Recycle Unit Sludge	\$	\$	\$
	Refrigerant	\$	\$	\$
	Lint & Rags	\$	\$	\$
	Solvent Containers	\$	\$	\$
	Spotting Chemicals/Containers	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$ 4,200	\$ 2,100	\$ 2,100

Checklist	G. Regulatory Compliance (Labor, Supervision, Materials)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Permitting	\$	\$	\$
	Training	\$	\$	\$
	Monitoring/Testing	\$	\$	\$
	Inspections/Audits	\$	\$	\$
	Labeling	\$	\$	\$
	Manifesting	\$	\$	\$
	Recordkeeping & Reporting	\$	\$	\$
	Spill Containment/Clean-up	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

Checklist	H. Liability and Insurance	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Legal Fees	\$	\$	\$
	Fines/Penalties	\$	\$	\$
	Site Cleanup & Monitoring	\$	\$	\$
	Personal Injury	\$	\$	\$
	Property/Natural Resource Damage	\$	\$	\$
		\$	\$	\$
	General Business Insurance	\$	\$	\$
	Pollution Liability Insurance	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	I. Advertising Materials	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Signs	\$	\$	\$
	Business Cards	\$	\$	\$
	Flyers	\$	\$	\$
	Postage	\$	\$	\$
	Advertising Fees	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	J. Off-Site Services	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Shirt laundering	\$	\$	\$
	Leathers	\$	\$	\$
	Tailoring	\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	K. Claims	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Cost for Damaged Clothing	\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

STEP 2. ESTIMATE YOUR UP-FRONT COSTS

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

STEP 2: Enter information on your annual loan/lease payment.

Basic Instructions:

In Step 2, you estimate your up-front costs in two different ways: 1) Gather information on your financing package from your bank, lease agent, or vendor, and 2) Use the Up-Front Investment Cost Checklist to make sure that you include all relevant up-front costs (even those not included in your loan or lease package).

LOAN WORKSHEET (Use this box if you plan to finance the investment with a loan.)

Loan payments will end after

5 years

Interest rate

9 %

Annual loan payment (including principal and interest)

\$ 7,984

Additional one-time investment costs not included in loan

\$ 0

(See the Up-Front Investment Cost Checklist for a list of equipment and other items that are not covered by your loan.)

LEASE WORKSHEET (Use this box if you plan to finance the investment with a lease.)

Lease payments will end after

_____ years

Buy-out price at end of lease

\$ _____

Annual lease payment (including principal and interest)

\$ _____

Additional one-time investment costs not included in lease

\$ _____

(See the Up-Front Investment Cost Checklist for a list of equipment and other items that are not covered by your lease.)

STEP 3. ESTIMATE YOUR ANNUAL SAVINGS

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

STEP 3: Estimate the change in annual operating costs and revenues due to the investment.

Basic Instructions:

In Step 3 of the analysis, you summarize the annual savings due to the investment using information from the Annual Operating Cost Checklist. You can use the Annual Operating Cost Checklist in two ways: 1) You can use it to identify costs that may change as a result of the investment, using up and down arrows to indicate whether you estimate the costs will increase or decrease; and 2) You can enter actual dollar estimates of your annual operating costs on the Annual Operating Cost Checklist. You should copy the dollar estimates from the shaded Subtotals on the Annual Operating Cost Checklist into the following box. Some of the numbers you copy may be positive (indicating savings) and others negative (indicating cost increases). Sum the numbers you copy into the box to show the TOTAL at the bottom. You should also estimate and record any increase in Operating Revenues due to your investment.

Operating Cost Category Subtotals From the Annual Operating Cost Checklist	SAVINGS / YR
	Current - New
A. Cleaning Supplies	\$ -662
B. Clothes Handling Supplies	\$
C. Labor and Supervision	\$ 4,160
D. Utilities	\$ 1,200
E. Maintenance & Waste Management	\$
F. Waste Storage, Hauling & Disposal	\$ 2,100
G. Regulatory Compliance	\$
H. Liability and Insurance	\$
I. Advertising Materials	\$
J. Off-Site Services	\$
K. Claims	\$
TOTAL	\$ 6,798

Increase in Operating Revenues Resulting from Your Investment	INCREASE / YR
	New - Current
Total Increase in Revenues	\$ 0

STEP 4. ESTIMATE THE CHANGE IN YOUR CASH FLOW - LEASE WORKSHEET

Not Applicable - Used LOAN
Worksheet Instead

Project Title:	Partial Conversion to Wet Cleaning
Date:	3/11/97

STEP 4: Estimate the Investment's Impact on your cash flow - Lease Worksheet.

LEASE WORKSHEET (Use this worksheet if you plan to finance the equipment with a lease.)

Tax Calculation

1. Total Increase in Revenues (from Step 3)
2. Annual Operating Cost Savings (from Step 3)
3. Incremental Operating Savings (Line 1 + Line 2)
4. Annual Lease Payment (from Step 2)
5. Taxable Income (Line 3 - Line 4)
6. Effective Tax Rate (Ask your accountant)
7. Change in Income Taxes (Line 5 * Line 6)

Cash Flow Calculation

8. Incremental Operating Savings (Line 3)
9. Change in Income Taxes (Line 7)
10. Annual Lease Payment (Line 4)
11. Buy-out Price at End of Lease (in Buy-out Year Only) (from Step 2)
12. Additional One-Time Investment Costs NOT Included in Lease (from Step 2)
13. After-Tax Cash Flow (Line 8 - Line 9 - Line 10 - Line 11 - Line 12)
14. Cumulative Cash Flow (Line 13 + Line 14 from previous year)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1								
2								
3								
4								
5								
6								
7								

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
8								
9								
10								
11								
12								
13								
14								

STEP 4. ESTIMATE THE CHANGE IN YOUR CASH FLOW - LOAN WORKSHEET

Project Title: Partial Conversion to Wet Cleaning
 Date: 3/11/97

STEP 4: Estimate the investment's impact on your cash flow - Loan Worksheet.

LOAN WORKSHEET (Use this worksheet if you plan to finance the equipment with a loan.)

Tax Calculation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1. Total Increase in Revenues (from Step 3)	0	0	0	0	0	0	0	0
2. Annual Operating Cost Savings (from Step 3)	6,798	6,798	6,798	6,798	6,798	6,798	6,798	6,798
3. Incremental Operating Savings (Line 1 + Line 2)	6,798	6,798	6,798	6,798	6,798	6,798	6,798	6,798
4. Equipment Depreciation (from Depreciation Worksheet below)	2,343	4,719	4,719	4,719	4,719	4,719	4,719	2,343
5. Loan Interest Payment (Ask your lender)	719	719	719	719	719	719	719	0
6. Taxable Income (Line 3 - Line 4 - Line 5)	3,736	1,360	1,360	1,360	1,360	2,079	2,079	4,455
7. Effective Tax Rate (Ask your accountant)	15%	15%	15%	15%	15%	15%	15%	15%
8. Change in Income Taxes (Line 6 * Line 7)	560	204	204	204	204	312	312	668

Cash Flow Calculation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
9. Incremental Operating Savings (Line 3)	6,798	6,798	6,798	6,798	6,798	6,798	6,798	6,798
10. Change in Income Taxes (Line 8)	560	204	204	204	204	312	312	668
11. Annual Loan Payment (from Step 2)	7,984	7,984	7,984	7,984	7,984	7,984	7,984	0
12. Additional One-Time Investment Costs NOT included in Loan (from Step 2)	0	0	0	0	0	0	0	0
13. After-Tax Cash Flow (Line 9 - Line 10 - Line 11 - Line 12)	1,746	1,390	1,390	1,390	1,390	6,486	6,486	6,130
14. Cumulative Cash Flow (Line 13 + Line 14 from previous year)	1,746	3,136	4,526	5,916	7,306	13,792	20,278	26,408

DEPRECIATION WORKSHEET

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1. Total Equipment Cost (Ask your equipment vendor)	33,000							
2. Depreciation Percentages*	7.1%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	7.1%
3. Equipment Depreciation (Year 1 cost from Line 1) * (Line 2)	2,343	4,719	4,719	4,719	4,719	4,719	4,719	2,343

* The worksheet uses the straight line depreciation method with a half-year convention and a depreciation of seven years for estimation purposes only. Do not use this depreciation worksheet to assist in calculating your shop's taxes; instead consult an accountant to calculate your shop's depreciation tax break and tax payments.

5. COPIES OF BLANK WORKSHEETS

Copies of the blank financial analysis worksheets follow. When you are ready to use them for analysis of an investment, make an extra copy to work on, keeping the originals for the future analyses, for yourself or for other cleaners you know. Write the name of your investment project and the date at the top of each page of the working copy.

UP-FRONT INVESTMENT COST CHECKLIST

Project Title:
Date:

[illegible]

Checklist	B. Construction/Installation (NOT included in loan/lease) (Labor, Supervision, Materials)	Investment Costs NOT included in loan/lease
	Shop Labor & Supervision	\$
	Contractor/Vendor Fees	\$
	Construction Equipment Rental	\$
	Demolition	\$
	Old Equipment/Rubbish Hauling & Disposal	\$
	Plumbing/Piping	\$
	Electrical Systems	\$
	Ventilation/Exhaust Systems	\$
		\$
		\$
		\$
	SUBTOTAL	\$

UP-FRONT INVESTMENT COST CHECKLIST

Project Title:
Date:

Checklist	C. Permitting (NOT included in loan/lease) (City, County, State, Federal)	Investment Costs NOT included in loan/lease
	Shop Labor & Supervision	\$
	Contractor/Vendor Fees	\$
	City, County, or State Business License	\$
	City or County Health Department Permit	\$
	Perchloroethylene Use Permit	\$
	Wastewater Evaporator Permit	\$
		\$
		\$
		\$
	SUBTOTAL	\$

Checklist	D. Start-up/Training (NOT included in loan/lease) (Labor, Supervision, Materials)	Investment Costs NOT included in loan/lease
	Training in Equipment Operation	\$
	Training in Equipment Maintenance	\$
	Training in Dry/Wet Cleaning Techniques	\$
	Environmental and Safety Training	\$
	Cleaning Test Runs	\$
	Start-up Supplies	\$
		\$
		\$
		\$
	SUBTOTAL	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:
Date:

Checklist	A. Cleaning Supplies (Purchase, Delivery, Storage)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Perchloroethylene (including any taxes)	\$	\$	\$
	Detergent for Dry Cleaning Charge	\$	\$	\$
	Solvent Filters	\$	\$	\$
	Solvent Filter Additives	\$	\$	\$
	Detergent/Soap for Wet Cleaning	\$	\$	\$
	Finisher/Sizer	\$	\$	\$
	Starch	\$	\$	\$
	Water Repellent	\$	\$	\$
	Odor Neutralizer	\$	\$	\$
	Fabric Softener	\$	\$	\$
	Spotting Chemicals	\$	\$	\$
	Spotting Brushes/Bone Scrapers	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	B. Clothes Handling Supplies (Purchase, Delivery, Storage)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Order Tickets/Receipts	\$	\$	\$
	Garment Tags	\$	\$	\$
	Staples	\$	\$	\$
	Durable Bags/Baskets	\$	\$	\$
	Nets	\$	\$	\$
	Hangers	\$	\$	\$
	Draperies/Tubes and Bands	\$	\$	\$
	Safety Pins and Other Clips	\$	\$	\$
	Plastic Garment Bags	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:
Date:

Checklist	C. Labor and Supervision (Wage or Salary, Fringe Benefits)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Management	\$	\$	\$
	Cleaning	\$	\$	\$
	Spotting	\$	\$	\$
	Pressing	\$	\$	\$
	Counter	\$	\$	\$
	Training	\$	\$	\$
	Advertising	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	D. Utilities	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Water	\$	\$	\$
	(for cleaning, steam generation, cooling)	\$	\$	\$
		\$	\$	\$
	Electricity	\$	\$	\$
		\$	\$	\$
	Fuel	\$	\$	\$
		\$	\$	\$
	Sewer	\$	\$	\$
		\$	\$	\$
	Refrigerant	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:
Date:

Checklist	E. Maintenance & Waste Management (Labor & Materials)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Monitoring Perchloroethylene Mileage	\$	\$	\$
	Monitoring Pressure Gauges	\$	\$	\$
	Perchloroethylene Vapor & Liquid Leak Repair	\$	\$	\$
	Cleaning Solvent Storage Tank(s)	\$	\$	\$
	Changing Cartridge Solvent Filters	\$	\$	\$
	Changing Polishing Filters	\$	\$	\$
	Precoating Tubular Solvent Filters	\$	\$	\$
	Regeneration of Tubular/Disc Solvent Filters	\$	\$	\$
	Water Cooling Unit (Chiller) Maintenance	\$	\$	\$
	Condenser Maintenance	\$	\$	\$
	Water Separator Maintenance	\$	\$	\$
	Solvent Still Draining and Cleaning	\$	\$	\$
	Muck Cooker Draining and Cleaning	\$	\$	\$
	Replacing Wastewater Carbon Adsorber Filters	\$	\$	\$
	Wastewater Evaporator Maintenance	\$	\$	\$
	Wastewater Treatment/Recycle Unit Maintenance	\$	\$	\$
	Replacing Vapor Carbon Adsorbers Filters	\$	\$	\$
	Cleaning Button Trap	\$	\$	\$
	Cleaning Lint Trap	\$	\$	\$
	Other Cleaning Machine Maintenance	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:
Date:

Checklist	F. Waste Storage, Hauling & Disposal (Labor, Supervision, Materials)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Perchloroethylene	\$	\$	\$
	Used Solvent Filters & Prefilters	\$	\$	\$
	Spent Carbon from Vapor/Wastewater Adsorbers	\$	\$	\$
	Filter Muck	\$	\$	\$
	Muck Cooker Residue	\$	\$	\$
	Solvent Still Sludge	\$	\$	\$
	Water Separator Wastewater	\$	\$	\$
	Water Treatment/Recycle Unit Sludge	\$	\$	\$
	Refrigerant	\$	\$	\$
	Lint & Rags	\$	\$	\$
	Solvent Containers	\$	\$	\$
	Spotting Chemicals/Containers	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	G. Regulatory Compliance (Labor, Supervision, Materials)	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Permitting	\$	\$	\$
	Training	\$	\$	\$
	Monitoring/Testing	\$	\$	\$
	Inspections/Audits	\$	\$	\$
	Labeling	\$	\$	\$
	Manifesting	\$	\$	\$
	Recordkeeping & Reporting	\$	\$	\$
	Spill Containment/Clean-up	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

ANNUAL OPERATING COST CHECKLIST

Project Title:
Date:

Checklist	H. Liability and Insurance	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Legal Fees	\$	\$	\$
	Fines/Penalties	\$	\$	\$
	Site Cleanup & Monitoring	\$	\$	\$
	Personal Injury	\$	\$	\$
	Property/Natural Resource Damage	\$	\$	\$
		\$	\$	\$
	General Business Insurance	\$	\$	\$
	Pollution Liability Insurance	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	I. Advertising Materials	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Signs	\$	\$	\$
	Business Cards	\$	\$	\$
	Flyers	\$	\$	\$
	Postage	\$	\$	\$
	Advertising Fees	\$	\$	\$
		\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	J. Off-Site Services	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Shirt laundering	\$	\$	\$
	Leathers	\$	\$	\$
	Tailoring	\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

Checklist	K. Claims	COST / YR		SAVINGS / YR
		Current System	New System	Current - New
	Cost for Damaged Clothing	\$	\$	\$
		\$	\$	\$
	SUBTOTAL	\$	\$	\$

STEP 2: ESTIMATE YOUR UP-FRONT COSTS

Project Title:
Date:

STEP 2: Enter information on your annual loan/lease payment.

Basic Instructions:

In Step 2, you estimate your up-front costs in two different ways: 1) Gather information on your financing package from your bank, lease agent, or vendor, and 2) Use the Up-Front Investment Cost Checklist to make sure that you include all relevant up-front costs (even those not included in your loan or lease package).

LOAN WORKSHEET (Use this box if you plan to finance the investment with a loan.)

Loan payments will end after	_____ years
Interest rate	_____ %
Annual loan payment (including principal and interest)	\$ _____
Additional one-time investment costs not included in loan	\$ _____

(See the Up-Front Investment Cost Checklist for a list of equipment and other items that are not covered by your loan.)

LEASE WORKSHEET (Use this box if you plan to finance the investment with a lease.)

Lease payments will end after	_____ years
Buy-out price at end of lease	\$ _____
Annual lease payment (including principal and interest)	\$ _____
Additional one-time investment costs not included in lease	\$ _____

(See the Up-Front Investment Cost Checklist for a list of equipment and other items that are not covered by your lease.)

STEP 3. ESTIMATE YOUR ANNUAL SAVINGS

Project Title:
Date:

STEP 3: Estimate the change in annual operating costs and revenues due to the investment.

Basic Instructions:

In Step 3 of the analysis, you summarize the annual savings due to the investment using information from the Annual Operating Cost Checklist. You can use the Annual Operating Cost Checklist in two ways: 1) You can use it to identify costs that may change as a result of the investment, using up and down arrows to indicate whether you estimate the costs will increase or decrease; and 2) You can enter actual dollar estimates of your annual operating costs on the Annual Operating Cost Checklist. You should copy the dollar estimates from the shaded Subtotals on the Annual Operating Cost Checklist into the following box. Some of the numbers you copy may be positive (indicating savings) and others negative (indicating cost increases). Sum the numbers you copy into the box to show the TOTAL at the bottom. You should also estimate and record any increase in Operating Revenues due to your investment.

Operating Cost Category Subtotals From the Annual Operating Cost Checklist	SAVINGS / YR
	Current - New
A. Cleaning Supplies	\$
B. Clothes Handling Supplies	\$
C. Labor and Supervision	\$
D. Utilities	\$
E. Maintenance & Waste Management	\$
F. Waste Storage, Hauling & Disposal	\$
G. Regulatory Compliance	\$
H. Liability and Insurance	\$
I. Advertising Materials	\$
J. Off-Site Services	\$
K. Claims	\$
TOTAL	\$

Increase in Operating Revenues Resulting from Your Investment	INCREASE / YR
	New - Current
Total Increase in Revenues	\$

STEP 4. ESTIMATE THE CHANGE IN YOUR CASH FLOW - LEASE WORKSHEET

Project Title:	
Date:	

STEP 4: Estimate the investment's impact on your cash flow - Lease Worksheet.

LEASE WORKSHEET (Use this worksheet if you plan to finance the equipment with a lease.)

Tax Calculation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1. Total Increase in Revenues (from Step 3)								
2. Annual Operating Cost Savings (from Step 3)								
3. Incremental Operating Savings (Line 1 + Line 2)								
4. Annual Lease Payment (from Step 2)								
5. Taxable Income (Line 3 - Line 4)								
6. Effective Tax Rate (Ask your accountant)								
7. Change in Income Taxes (Line 5 * Line 6)								

Cash Flow Calculation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
8. Incremental Operating Savings (Line 3)								
9. Change in Income Taxes (Line 7)								
10. Annual Lease Payment (Line 4)								
11. Buy-out Price at End of Lease (in Buy-out Year Only) (from Step 2)								
12. Additional One-Time Investment Costs NOT Included in Lease (from Step 2)								
13. After-Tax Cash Flow (Line 8 - Line 9 - Line 10 - Line 11 - Line 12)								
14. Cumulative Cash Flow (Line 13 + Line 14 from previous year)								

STEP 4. ESTIMATE THE CHANGE IN YOUR CASH FLOW - LOAN WORKSHEET

Project Title: _____
 Date: _____

STEP 4: Estimate the investment's impact on your cash flow - Loan Worksheet.

LOAN WORKSHEET (Use this worksheet if you plan to finance the equipment with a loan.)

Tax Calculation

1. Total Increase in Revenues (from Step 3)
2. Annual Operating Cost Savings (from Step 3)
3. Incremental Operating Savings (Line 1 + Line 2)
4. Equipment Depreciation (from Depreciation Worksheet below)
5. Loan Interest Payment (Ask your lender)
6. Taxable Income (Line 3 - Line 4 - Line 5)
7. Effective Tax Rate (Ask your accountant)
8. Change in Income Taxes (Line 6 * Line 7)

Cash Flow Calculation

9. Incremental Operating Savings (Line 3)
10. Change in Income Taxes (Line 8)
11. Annual Loan Payment (from Step 2)
12. Additional One-Time Investment Costs NOT Included in Loan (from Step 2)
13. After-Tax Cash Flow (Line 9 - Line 10 - Line 11 - Line 12)
14. Cumulative Cash Flow (Line 13 + Line 14 from previous year)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1								
2								
3								
4								
5								
6								
7								
8								

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
9	/							
10								
11								
12								
13								
14								

DEPRECIATION WORKSHEET

1. Total Equipment Cost (Ask your equipment vendor)
2. Depreciation Percentages*
3. Equipment Depreciation (Year 1 cost from Line 1) * (Line 2)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1								
2	7.1%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	7.1%
3								

* The worksheet uses the straight line depreciation method with a half-year convention and a depreciation of seven years for estimation purposes only. Do not use this depreciation worksheet to assist in calculating your shop's taxes; instead consult an accountant to calculate your shop's depreciation tax break and tax payments.

