

Final Report

Michigan Environmental Results Program for the Dry Cleaning Sector



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EXECUTIVE SUMMARY

In 2005, the Michigan Department of Environmental Quality (MDEQ) was awarded a State Innovation Grant (SIG) from U.S. Environmental Protection Agency (EPA) to develop and implement an Environmental Results Program (ERP) for Michigan's dry cleaning sector. The grant funding was to be used for this project's two major components: (1) the implementation of a pilot ERP for Michigan's Dry Cleaning Sector, which would incorporate the relevant air, water, and waste requirements into a multi-media, self-certification, compliance assistance package; and (2) the development of an electronic data collection tool that could be used to manage data collected from the ERP. This tool was to be made transferrable to other interested states.

A full ERP cycle, including baseline inspections, facility assistance, self-certification, and post-certification inspections were completed from 2006 to 2008. Data analysis of the results showed little improvement in compliance with air quality requirements, but significant improvements in compliance in several of the waste and wastewater requirements.

The MDEQ worked with a contractor to develop a data management system that could be used to collect and manage data from ERP related activities. The functional aspects of this program were completed in March 2009¹. The program includes a web based administrative component and a field application that is used to collect inspection data.

Dry cleaners in Michigan have been inspected for years using traditional inspection methods. The ERP for dry cleaners was a first-of-its-kind endeavor for Michigan and allowed the MDEQ to experiment with an alternative method of managing dry cleaning compliance. While it is still unclear as to what the future holds for ERP in Michigan, this project has demonstrated Michigan's ability to successfully implement an ERP. It will serve as a model for our state and others that wish to use alternative means to manage small business sectors where it may not be feasible using traditional methods. Thanks to the SIG and the resulting pilot project, Michigan stands ready to use ERP as a management tool for small business sectors throughout the state when the time is ready and opportunity presents itself.

¹ While the functional components of the ERP data management program were complete in March 2009, the MDEQ continued to work with the consultant to resolve several issues associated with migrating existing data into the new system. This issue took much longer than expected to fully resolve. The system was placed into the MDEQ production environment in August 2009.

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PURPOSE AND GOALS OF PROJECT

The Michigan Department of Environmental Quality (MDEQ) developed the Environmental Results Program (ERP) for dry cleaners to aid owner/operator understanding of all applicable environmental regulations in the dry cleaning sector, to improve facility compliance with these regulations, and to enhance sector-wide use of pollution prevention activities and best management practices. The MDEQ expected to aid in the development and transfer of useful template ERP materials to other sectors and states as it builds on similar materials and experiences shared by the Massachusetts's Department of Environmental Protection dry cleaning ERP. Through Michigan's ERP, MDEQ leveraged internal and external resources, including partnerships with the local dry cleaning trade associations, dry cleaning equipment vendors, and dry cleaning businesses.



BACKGROUND

The dry cleaning industry is a service industry for the cleaning of garments, draperies, leather goods, and other fabric items. The number and size of dry cleaning firms varies. Commercial facilities are by far the most prevalent and include full service, retail operations located in shopping centers and near densely populated areas. Industrial dry cleaners operate the largest facilities which are often part of a business that rents uniforms, towels or other garments.

Two general types of cleaning fluids are used in the industry: petroleum solvents and synthetic solvents. Petroleum solvents are combustible hydrocarbon mixtures similar to kerosene. Operations using petroleum solvents are known as petroleum plants. Synthetic solvents, the most common of which is Perchloroethylene (PERC) are nonflammable halogenated hydrocarbons. PERC and other solvents may be emitted from dry cleaning machines during operation of the units or during the solvent reclamation processes. The dry cleaning industry is the most significant emission source of PERC in the United States. In Michigan, the vast majority of the cleaners use perchloroethylene solvent in their dry cleaning operations; however, there are also some that use petroleum solvents and alternative solvents. At the start of Michigan's ERP project, there were 858 dry cleaners identified as using perc throughout the state. At the time the Post-certification sample was developed, there were only 767 PERC cleaners.

The National Emission Standard for Hazardous Air Pollutants (NESHAP) for Perchloroethylene Dry Cleaning Facilities and the New Source Performance Standards (NSPS) for petroleum solvent dry cleaning facilities are two federal standards established under the Clean Air Act Amendments of 1990 to control air emissions of PERC and petroleum solvents from new and existing dry cleaning facilities. Each standard contains a variety of emission control, monitoring, operation and maintenance, recordkeeping, reporting and compliance requirements, depending on the emission source type.

The Dry Cleaners are monitored by the [Dry Cleaning Program](#) of the Air Quality Division, Michigan Department of Environmental Quality. The MDEQ Dry Cleaning Program is unique in that they inspect every Class IV (perchloroethylene) establishment annually. Before a new dry cleaning plant is established or equipment is installed, or an existing establishment is modified, prior approval must be obtained from the Dry Cleaning Program. The inspectors in the MDEQ Dry Cleaning Program have a thorough knowledge of the dry cleaning process and the rules that apply to this activity. When



Dry Cleaning Inspector

Michigan's dry cleaning ERP began in 2005, there were four inspectors assigned to various regions of the state. These inspectors assisted the MDEQ with the development of the guidance materials and conducting baseline and post-certification inspections for the ERP. At the time the post-certification inspections were conducted in 2008, there were three inspectors.

There are two organizations that represent the dry cleaners in the state: the Michigan Association of Laundering and Drycleaning (MILD) and the Korean Drycleaning Association (KDA). Both of these organizations were instrumental in reviewing the guidance developed by the DEQ, and implementing the ERP. Both associations were very supportive of the ERP concept and hosted several events to assist with the education of facilities.

In 2005, the MDEQ was awarded a \$199,200.00 State Innovation Grant (SIG) from U.S. EPA to develop and implement its dry cleaning ERP. The state of Michigan was required to provide a match of \$100,000.00. Essentially, there were two components funded by the grant:

- (1) The implementation of a pilot ERP for Michigan's Dry Cleaning Sector, which would incorporate the relevant air, water, and waste requirements into a multi-media, self-certification, compliance assistance package.
- (2) The development of an electronic data collection tool that could be used to manage data collect from the ERP. This tool was to be made transferrable to other interested states.

ERP IMPLEMENTATION

The major tasks and timeline associated with the Michigan Environmental Results Program (MERP) are outlined in Table 1. A detailed description of how each of these tasks was executed is provided in the sections following the table.

Table 1: Schedule of Major Project Tasks			
Task Name	Task Description	Start Date	End Date
Baseline Inspections	Inspections at facilities to establish a baseline for performance measures. Facilities selected at random from the entire targeted population based upon sample design from statistical methodology.	July 2006	Dec 2006
Baseline Analysis	Analysis of inspection data to establish a baseline for the project's performance measures.	Dec 2006	Feb 2007
Facility Assistance	Development and delivery of compliance/technical assistance to facilities, which is expected to take the form of workbooks, fact sheets, and/or workshops.	Jan 2007	Sept 2007
Self-certification	Implementation of a voluntary facility self-certification approach. Self-certification refers to the submission of a record of a facility's compliance and beyond-compliance practices.	Aug 2007	Sept 2007
Analysis of Self-certification Results	Analysis of self-certification data.	Sept 2007	Oct 2007
Post-Certification Inspections	Inspections at facilities to establish whether sector performance measures (and other measures) have changed since the baseline. Inspection data also used to cross-check self-certification data at inspected facilities. Facilities selected at random from the entire universe of facilities, based upon sample design from statistical methodology.	June 2008	Nov 2008
Data Analysis	Analysis of baseline, self-certification, and post-certification data to understand change in facility performance and overall outcomes of interest. Assessment of project efficiency.	Dec 2008	April 2008
Data Input and Management	Development and implementation of an approach to cost-effectively input and manage the MERP data, including primary and secondary data. Primary data consists of data from inspection reports and facility forms (including self-certification forms). Secondary data sources include lists of facilities from regulatory and private-sector databases.	Nov 2005	March 2009 (functional) Aug 2009 (Production)

Baseline Inspections

In a random sample, over 300 facilities were identified using statistical methodology developed by Cadmus Group, Inc. (methodology developed 12/23/2005). Four inspectors from the Dry Cleaning Program were available to collect the baseline inspection data. Each of these inspectors was responsible for a specific geographical region in Michigan; therefore, the sample was stratified by inspectors to ensure that a proportional amount of facilities were sampled in each region by each inspector. Table 2 shows the stratified sample.

Table 2: Baseline Sample

Staff	Number of Establishments	Sample	Proportion
Jack	138	48	34.8%
Karl	123	43	35.0%
Jong	298	104	34.9%
Joe	299	105	35.1%
Total	858	300	35.0%

Baseline Inspection Audit Form: The baseline inspection questions were finalized before all baseline inspections began. It was important that the questions that appeared in the baseline inspections matched the questions that were to be used during the self-audit period. We worked extensively with the MDEQ Dry Cleaning Program, the dry cleaning trade associations, and dry cleaning establishments to ensure that the questions in the audit were accurate, simple, and applicable to the types of dry cleaners in Michigan (i.e. some requirements from the federal NESHAP were not included because they are not applicable to dry cleaners in Michigan). The questions were used to develop an electronic data collection tool to be used during the baseline inspections (see next item).

Baseline Inspection Data Collection Tool: To make the collection of baseline data more efficient and consistent, MDEQ developed an access database tool that could be used to collect the data. This tool contained all the audit questions for each facility that was to be audited. Inspectors installed the program onto their pen tablets and completed all applicable questions when at the facility. At the end of each month the inspectors submitted a copy of their database, which included the audits for all the facilities they inspected over the previous month. This data was compiled into a master database.

ERP Baseline Inspection Data Collection Tool

Inspector Training: Inspectors from the MDEQ Dry Cleaning Program were trained on how to use the electronic version of the audit forms and collect the baseline data. In July 2006 all inspectors accompanied two staff from the MDEQ’s Waste and Hazardous Materials Division on an on-site training visit to two dry cleaning facilities. The purpose of these visits was to familiarize inspectors with

some of the waste issues encountered at a dry cleaning facility and to familiarize them with the associated waste questions in the audit.

Inspections: Statewide baseline inspections at 311 facilities were conducted from August to December 2006. Data was collected electronically using the tool identified above and reported on a monthly basis. Inspection data was added to a master database. Several meetings were held with the inspectors to discuss the status of the inspections and to answer questions pertaining to data collection.

The inspectors conducting the baseline inspections did not encounter any major set backs; however, the following items were discovered and were subsequently addressed:

- It was discovered that several of the facilities identified for baseline inspection had gone out of business. This decrease in the number of dry cleaners is a statewide trend and was noted in the development of the sample for the post-certification inspections.
- During inspections, the inspectors identified many changes that needed to be made to the audit based on their field testing of the questions in the audit. These suggestions were later incorporated into the self-certification audit and post-certification inspection. Every effort was made to ensure that the intent of each question remained consistent so that data from the baseline sample and subsequent samples could be compared easily.

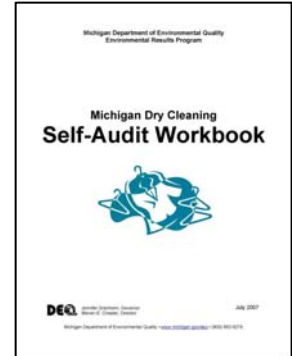
Data Analysis: The analysis of the baseline data did not provide any major revelations as to this sectors compliance with air quality requirements. The baseline data identified that a significant number of dry cleaners were not keeping the appropriate records necessary to demonstrate compliance with the NEHSAP. However, this deficiency was already well know by the program and has been a problem ever since the NESHAP went into effect. Since our inspectors had not been collecting data on waste and wastewater requirements, the data did point out some compliance issues that the MDEQ was not aware of. The baseline data showed that many of the cleaners sampled generated more that 220 lbs of hazardous waste per month, making them small quantity generators. While this number was higher than expected, it was most likely due to poor recordkeeping. In reality, many of these sources generate less than 220 lbs of hazardous waste per month; however, they lack sufficient records to justify their claim. Due to this revelation, MDEQ included a detailed explanation of how to calculate monthly waste generation in the self-audit workbook and associated training. Other data points of interest were related to wastewater disposal. Our data showed that very few sources had permission or authorization to dispose of their wastewater through the sewer to their wastewater treatment plant. While the MDEQ does not regulate discharges to the sewer system, it is important that sources are informed of this requirement. The follow up guidance to the sector addressed the details on this requirement.

In November 2007, an issue with MDEQ's baseline data was discovered. The issue pertained to inconsistencies of when certain inspections were carried out. MDEQ established the window for conducting the baseline inspections from July – December 2006; however, some inspections were conducted outside of the baseline inspection window. This was discovered during review of the data with U.S. EPA and an ERP consultant, while compiling information for the **2008 ERP States Produce Results Report**. Ultimately, MDEQ decided to remove a significant amount of data from the baseline sample to ensure statistical validity. The number of valid inspections was reduced to 262 sources as opposed to 300 sources as a result of this mishap. Fortunately, the problem was discovered soon enough so we could make the necessary adjustments to our data and better prepare our inspectors for the post-certification inspections.

Facility Assistance

The development of the compliance assistance materials was a coordinated effort that involved inspectors from the MDEQ Dry Cleaning Program, the Michigan Institute of Laundering and Drycleaning (MILD), the Korean Dry Cleaning Association (KDA), and individual dry cleaning establishments. Drafts of the checklist and workbook were prepared and then reviewed by these stakeholders.

In July 2007, the Self-Certification Workbook and forms were finalized. Fortunately, the Michigan Dry Cleaning Program has an inspector fluent in Korean and as a result, a Korean version of the certification forms and cover letter were developed. A Korean version of the workbook, however, was not created due to time constraints and the availability of the inspector to do the translation. Future revisions of the workbook will most likely include a Korean version. The Korean Drycleaning Association expressed their appreciation for the MDEQ's willingness to address the language barrier by providing a Korean version of the certification. The printing of the workbook and audit forms were funded under the SIG. The MDEQ printed 1,100 copies of each item, which was enough to provide each dry cleaner in the state with a copy of the materials as well as some extras to have available for the associations, inspectors, and workshops. An electronic version of all the self-certification material was posted at www.michigan.gov/deqenvassistance (click on "Dry Cleaning Workbook") including a template version of the audit forms, which facilities could use to electronically complete the forms and return via e-mail.



Self-Certification Workbook

The printing/mailing costs associated with the self-certification are detailed in the Table 3.

Table 3: Costs for Printing and Mailing		
Item Printed/Mailed	Number Printed/Mailed	Cost
Self-Certification Workbook	1,100	\$2,164.14
Self-Audit Form (English)	1,100	\$716.05
Self-Audit Form (Korean)	1,100	\$716.05
Return envelope	1,000	\$246.21
Mailing envelope	1,000	\$139.08
Cover letter	870	\$100.83
Reminder Card	900	\$67.13
Packet Mailing to Cleaner	870	\$1,781.51
Reminder Card Mailing	870	\$10.80
Submittal Postage Paid Return	# returned through 9/30/07	\$187.94
Total		\$6,129.74

It was decided that the MDEQ would not organize any formal workshops to accompany the self-certification. This decision was made based on our experience with conducting workshops with this sector in the past. During past attempts at outreach through workshops, a lot of time and money was invested in attempting to provide training only to have few facilities participate. As an alternative, the MDEQ developed an on-line training program that facilities could view at their leisure, at no cost, and anonymously. The on-line training can be viewed at www.michigan.gov/deqenvassistance (click on "Dry Cleaning Workbook" then "Self-Audit On-line Training"). The on-line training was completed and posted on the internet in September 2007 (half-way through the certification window). The availability of the on-line training was advertised in a reminder card that was mailed to all facilities

during the first week of September as well as through the MILD Web site. Although we were not able to provide the training until September, we believe that facilities still had ample time to view the information. Unfortunately, we were not able to track how many facilities actually used the on-line training. Future on-line training will include a function that allows tracking of the number of users and even include an on-line survey that users can complete. In addition to the on-line training, MILD volunteered to organize two training workshops on the audit, which was our hope when we had initial discussions about the project with them. Workshops hosted by MILD were held in Grand Rapids and Farmington Hills. At each of these sessions we walked attendees through the self-certification forms and answered any questions that came up. Many of the issues discussed at these sessions have been summarized in the OBSERVATIONS AND RECOMMENDATIONS section of this report. In addition to these two sessions, the MDEQ conducted a presentation at MILD's Annual Meeting in Port Huron on July 27, 2007 and one of the inspectors was present at two of the KDA meetings to answer questions about the audit in September 2007. Another meeting was held with a major drycleaning supply distributor in August 2007. The purpose of this meeting was to educate sales representatives about ERP and how it will impact their customers. This meeting was recommended and arranged through one of the MILD members.

MILD Meeting Announcement

Article in KDA Newsletter about MDEQ-KDA Meeting on ERP

Self-Certification

The self-certification period began on August 1, 2007. All dry cleaners in the state were mailed a packet of material that included a cover letter, workbook, forms, and a self-addressed, postage paid return envelope (see audit materials on the following page). Facilities were asked to submit their completed self-certification forms by September 30, 2007. This date gave the cleaners exactly two months to review the material and submit the forms. We believed that the two-month window would allow enough time to provide outreach to the sector while also giving some amount of urgency to the response (i.e., we felt that giving cleaners more than two months would increase the likelihood that they would lose the material or put off doing it indefinitely). During the self-certification period, MDEQ staff responded to numerous phone calls from facilities. At the beginning of September, a post card was sent to facilities to remind them of the deadline for submission and availability of on-line training.

Many more audits were returned than anticipated. Approximately 323 were returned by the deadline and another 173 were received in the two weeks following the deadline. The final count was 496 self-certification forms returned, which was approximately 58% of the dry cleaners in Michigan. Data from each submittal was entered manually into a Microsoft Access database. The database not only captured the response to each question but also the information provided on the return to compliance plan and makeup of the self-certification pool (e.g., location, Korean or English version completed, etc.), and when the certifications were submitted to address the question, "Did most wait until the last week to submit or were they evenly dispersed throughout the certification window?"

When the self-certification packages were sent out to facilities, they were told that the MDEQ would send them a certificate recognizing their participation in this program if they completed and returned the forms. In October 2007, we sent a thank you letter and certificate to all facilities that completed and returned self-certification forms.

In general, the MDEQ received positive comments about the self-certification questions (i.e., easy to understand and follow); however, we also discovered some certification questions that needed to be improved/changed as a result of discussions we had with drycleaners and the association.

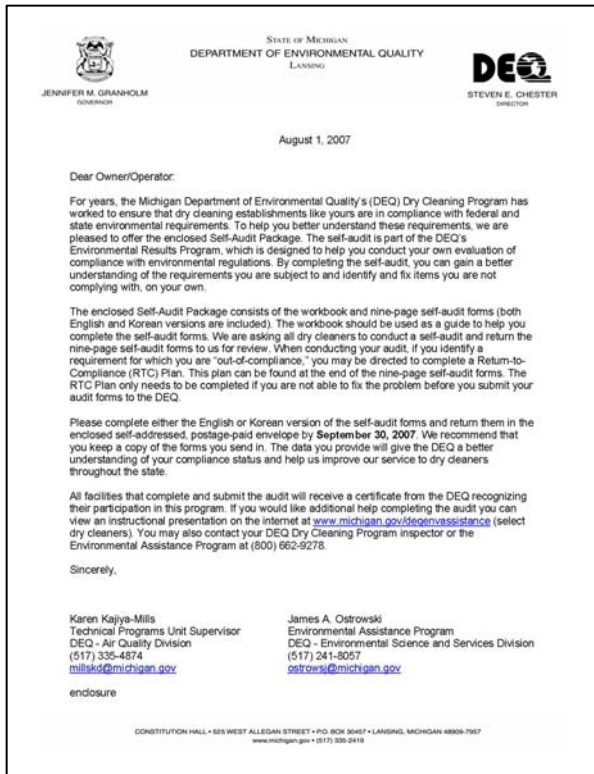


ERP Certificate

All data that was collected from facilities was entered into a database system by two staff members. The results from the self-certification can be found in Appendix A. Below are some of the main data points from the results:

- A total of 496 self-certification forms were returned, which is approximately 58% of the dry cleaners in Michigan.
- The vast majority of sources felt they were in compliance with all or most of the air and waste requirements they are subject to. This was in direct contrast to the data that was gathered during the baseline and post-certification inspections.
- 200 Return-to-Compliance Plans were received.
- 27 sources used the Korean version of the self-audit.

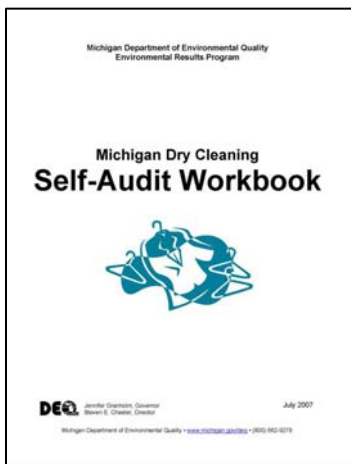
Self-Certification Documents



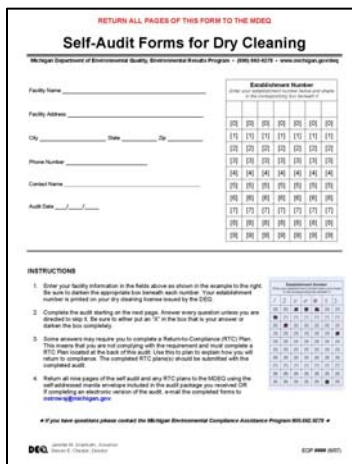
Self-Certification Letter from DEQ (English)



Self-Certification Letter from DEQ (Korean)



Workbook



Self-Certification Forms (English)



Self-Certification Forms (Korean)

Click on picture above to view actual document

Post-Certification Inspection

Working with an ERP consultant in 2007, it was decided that it would be best to conduct the post-certification inspections as close to the time that we conducted the baseline inspections as possible, which would be summer/fall 2008. It was decided that an inspection window of June-October 2008 would be sufficient. Since our dry cleaning inspectors set their inspection schedule for the year by December 31, it was necessary that the random sample be developed by December 31 so that the inspectors could be provided with a list of sources they should and should not visit prior to the post-certification window. Developing the sampling methodology for the post-certification inspections was somewhat complicated due to several factors: a significant reduction in the number of dry cleaners since the baseline sample, one less inspector, and the reassignment of the remaining three inspectors to territories different than what they covered during the baseline sample. Taking all these factors into consideration, we were able to develop a good sample of 250 sources, which were then divided up amongst the inspectors. The sample was stratified to account for changes in inspector facility assignment (i.e. facilities that were assigned to a particular inspector during the baseline sample may have changed during the post-certification sample). The stratified sample is shown in Table 4. A detailed explanation of the MDEQ's sampling methodology can be found in Appendix A.

'08 inspector	'06 inspector	# of inspections	switched inspections	inspector subtotal switched	switched/inspector total	08 by 06 proportional sample	Sample Size Recommended, by Stratum
Jack	Jack	106	0			35	35
Jack	Karl	75	75	75	41%	24	24
Joe	Joe	220	0			72	72
Joe	Jong	74	74	74	25%	24	24
Jong	Jong	193	0			63	50
Jong	Jack	10	10	99	34%	3	10
Jong	Joe	60	60			20	20
Jong	Karl	29	29			9	15
		767	248			250	250

Soon after the post-certification sample was developed, a meeting with the inspectors was held to explain the sampling methodology and provide them each with a list of all their sources including those that were to be included in the sample. Inspectors were briefed on the importance of waiting to visit the facilities identified as part of the sample until between June-October 2008. The inspectors made changes to their yearly inspection schedules to accommodate the post-certification inspection window.

Three inspectors from the MDEQ, Air Quality Division's Dry Cleaning Program completed post-certification inspections at 272 randomly selected facilities from June 2008 to November 2008. Data from each inspection was gathered on hard-copy forms or electronic templates of the forms. Inspectors were instructed to submit them periodically as they completed a batch. A Microsoft Access database was created to input the inspection results. No major problems or set backs were reported during this task.

2008 MERP Inspection Checklist	
Inspection Date	____/____/____ Inspector Initials _____
Facility Name	_____ Establishment Number _____
Facility Address	_____
PART 1: PERC DRY CLEANING MACHINE	
1.1. Machine operated according to manufacturer's specifications?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.2. Machine operating manuals kept on site?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.3. Dry cleaning machine door kept closed, except for loading and unloading?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.4. Does facility keep a log of the gallons of perc purchased each month?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.5. Perc purchase log kept on file for five years?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.6. Cartridge filters drained 24 hours before removal?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.7. Are specified components of the machine inspected weekly/bi-weekly for perceptible leaks?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.8. Are specified components inspected monthly for visible leaks while in operation with a halogenated hydrocarbon detector (PCE) gas analyzer?	<input type="checkbox"/> Yes <input type="checkbox"/> No
1.9. If a leak detected, is it repaired in 24 hours or if it cannot be repaired in 24 hours, are parts ordered within 2 working days and installed within 5 days of receiving them?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.10. Does facility keep a log of the date of any necessary repairs made to the machine?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.11. Does facility keep a log of machine inspections that identifies any components that are leaking?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.12. Small Area Source? Dry-to-dry machine installed before 12/9/91 AND did facility purchase less than 140 gallons of perc per year during all previous 12-month periods?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Skip to 1.16
Small and Large Dry-to-Dry Machine Control Requirements	
1.13. Dry-to-dry machines installed before 12/9/91 have an external refrigerated condenser AND a carbon adsorbent that was installed prior to 9/23/93? (Choose N/A if machine installed after 12/9/91)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
1.14. Dry-to-dry machines installed after 12/9/91 have an internal refrigerated condenser? (Choose N/A if machine installed before 12/9/91)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
1.15. Dry-to-dry machines initially installed after 12/21/05 have an internal carbon adsorbent AND refrigerated condenser? (Choose N/A if machine installed before 12/21/05)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
1.16. If major source, is the concentration of the perc in the dry cleaning machine drum at the end of the cycle measured weekly with a colorimetric detector tube or PCE gas analyzer? (Choose N/A if not major source)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A <input type="checkbox"/> Skip to 1.18
1.17. Is the concentration of perc less than 300 ppm?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
(*) = Required	

Post-Certification Inspection Form

Statistical Analysis

In December 2008, data collected from baseline inspections, self-certification, and post-certification inspections were submitted to The Cadmus Group, Inc. for review and analysis. A detailed analysis of results was provided to the MDEQ in March 2009. The results from the analysis are summarized in the MICHIGAN ERP PROJECT RESULTS section of this report. The actual detailed analysis of the data is contained in Appendix A of this report.

Data Input and Management (Development of ERP software tool)

A major financial component of the SIG was dedicated to the development of a software program that could be used to collect and manage data from the ERP. A stipulation of the funding was that the program developed had to be transferable, meaning that the code is not proprietary and could be shared with other states for use in the development of their own program. In early 2006, enfoTech Consulting was selected as the contractor to develop the program. However, the contract was not finalized until October 2006.



Field Assistant Collection Tool

It was decided that the system would be divided into two components: a web-based administrative component and a field assistant program to be used to gather data in the field. Data gathered via the field assistant would then be synced to the administrative system using a data sync function.

The development of this system took much longer than expected due to a number of set backs that occurred throughout the grant period. Most of these setbacks can be attributed to the limited number of staff available to test the system, and a number of changes the contractor made to the staff managing the program, as well as internal problems related to coordinating upgrades and changes to the beta application with our Department of Information Technology. The system was considered functionally complete in March 2009; however the MDEQ was not able to put the new software into production until August 2009. This delay was due to several complications that occurred with migrating existing dry cleaning data into the new system. The software is transferable to any state that wishes to use it. Many components are specific to Michigan's program; however, the software can be altered and manipulated to fit another state's program needs. Appendix B provides a detailed overview of the system and how it works.



The MDEQ developed a video tutorial that provides an overview of the system. The video is approximately 12 minutes. View the video by going to <http://www.screencast.com/t/ujjEkUnUvt9> or click [HERE](#). Note: Headphones or speakers should be used to hear the audio. If you experience problems please contact James Ostrowski at ostrowskij2@michigan.gov or 517.241.8057

MICHIGAN ERP PROJECT RESULTS

Michigan's Drycleaning ERP contained compliance questions related to perchloroethylene drycleaning machines, petroleum solvent drycleaning machines, waste, storage tanks, wastewater, and safety. The primary focus of the ERP was on three media – air, waste, and wastewater. Below is a summary of results for the air quality, waste, and wastewater media covered in the ERP. This data compares the baseline and post-certification results, which were collected and verified by MDEQ Dry Cleaning Inspectors. A summary of the data collected from the self-certification is provided on page 24. Detailed analysis of the results for each of the questions in the ERP can be found in Appendix A of this report.

Air Quality

There were 31 questions included in the air compliance portion of the Michigan Dry Cleaning ERP. MDEQ identified 3 questions as environmental business practice indicators (EBPIs). EBPIs are industry-specific performance measures used to provide a snapshot of facilities' environmental performance before and after certification, and to track facility and sector performance over time. The air related questions and possible answers are identified in Table 5, with the EBPIs highlighted.

Table 5: Air Quality Questions		
1.1.	Machine operated according to manufacturers' specifications?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.2.	Machine operating manuals kept on site?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.3.	Dry cleaning machine door kept closed, except for loading and unloading?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.4.	Does facility keep a log of the gallons of perc purchased each month?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.5.	Perc purchase logs kept on file for five years?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.6.	Cartridge filters drained 24 hours before removal?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.7.	Are specified components of the machine inspected <u>weekly/bi-weekly</u> for <u>perceptible leaks</u> ?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.8.	Are specified components inspected <u>monthly</u> for <u>vapor leaks</u> while in operation with a halogenated hydrocarbon detector PCE gas analyzer?	<input type="checkbox"/> Yes <input type="checkbox"/> No
1.9.	If a leak detected, is it repaired in 24 hours or if it cannot be repaired in 24 hours are parts ordered within 2 working days and installed within 5 days of receiving them?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.10.	Does facility keep a log of the date of any necessary repairs made to the machine?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.11.	Does facility keep a log of machine inspections that identifies any components that are leaking?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
1.12.	Small Area Source? Dry-to-dry machine installed <u>before</u> 12/9/91 AND did facility purchase <u>less</u> than 140 gallons of perc per year during all previous 12-month periods?	<input type="checkbox"/> Yes <input type="checkbox"/> No Skip to 1.31
1.13.	Dry-to-dry machines installed <u>before</u> 12/9/91 have an external refrigerated condenser <u>OR</u> a carbon adsorber that was installed prior to 9/22/93? (Choose N/A if machine installed after 12/9/91)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
1.14.	Dry-to-dry machines installed <u>after</u> 12/9/91 have an internal refrigerated condenser? (Choose N/A if machine installed before 12/9/91)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
1.15.	Dry-to-dry machines initially installed after 12/21/05 have an internal carbon adsorber AND refrigerated condenser? (Choose N/A if machine installed before 12/21/05)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
1.16.	If major source, is the concentration of the perc in the dry cleaning machine drum at the end of the cycle measured weekly with a colorimetric detector tube or PCE gas analyzer? (Choose N/A if not major source)	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A Skip to 1.18
1.17.	Is the concentration of perc less than 300 ppm?	<input type="checkbox"/> Yes <input type="checkbox"/> No*

Table 5: Air Quality Questions (continued)		
1.18. External refrigerated condensers on a vented machine routed properly so that the air-perc stream is not vented directly to atmosphere while drum is rotating? (Choose N/A if machine has no refrigerated condenser or is a non vented machine)	<input type="checkbox"/> Yes	<input type="checkbox"/> No* <input type="checkbox"/> N/A
1.19. Outlet temperature of the vapor stream passing through the cooling coil read weekly and equal to or less than 45° F (±2° F) or 7.2° C (±1.1° C)? (Choose N/A if reading pressure gauge to comply, see question 1.20)	<input type="checkbox"/> Yes	<input type="checkbox"/> No* <input type="checkbox"/> N/A
1.20. High and low pressures of the refrigeration system read and recorded on a weekly basis? (Choose N/A if no pressure gauges)	<input type="checkbox"/> Yes	<input type="checkbox"/> No* <input type="checkbox"/> N/A
1.21. Pressures within those specified by the manufacturer? (Choose N/A if no pressure gauges)	<input type="checkbox"/> Yes	<input type="checkbox"/> No* <input type="checkbox"/> N/A
1.22. Date, temperature sensor or pressure gauge monitoring results recorded weekly?	<input type="checkbox"/> Yes*	<input type="checkbox"/> No
1.23. Date, temperature sensor or pressure gauge monitoring results kept on file for five years?	<input type="checkbox"/> Yes*	<input type="checkbox"/> No
1.24. Is machine equipped with an external carbon adsorber?	<input type="checkbox"/> Yes	<input type="checkbox"/> No Skip to 1.30
1.25. If an external carbon adsorber is installed on a vented machine, is <u>none</u> of the air-perchloroethylene gas-vapor stream allowed to bypass the carbon adsorber to the atmosphere?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*
1.26. Is the concentration of perc in the exhaust of the external carbon adsorber measured weekly using a colorimetric detector tube or PCE gas analyzer?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*
1.27. Is the concentration of perc in the exhaust of the external carbon adsorber less than 100 parts per million per volume?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*
1.28. Are the date and colorimetric detector tube monitoring results recorded weekly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*
1.29. Are the date and colorimetric detector tube monitoring results kept on file for 5 years?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*
1.30. Are necessary repairs made to the refrigerated condenser and/or carbon adsorber?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*
1.31. Was a Notification of Compliance Status Form submitted to the MDEQ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*

Analysis of the results from both the baseline and post certificate inspections showed no statistically significant change for any of the EBPIs. However, there were some, non-EBPI, air related compliance questions for which a statistically significant change in compliance appeared. These questions and associated results data are shown in Table 6.

Table 6: Air Quality Significant Changes in Compliance			
Question	Post-Certification minus Baseline Designed based estimates		
	Change in Proportion	90% Confidence Interval	Change Between Rounds
1.5 Perc purchase logs kept on file for five years?	10.2	5.6 – 14.8	Significant Increase ↑
1.22 Date, temperature sensor or pressure gauge monitoring results recorded weekly?	9.1	3.6 – 14.6	Significant Increase ↑
1.23 Date, temperature sensor or pressure gauge monitoring results kept on file for five years?	10.6	5.2 – 15.9	Significant Increase ↑
1.9 If a leak detected, is it repaired in 24 hours or if it cannot be repaired in 24 hours are parts ordered within 2 working days and installed within 5 days of receiving them?	-1.6	-2.9 - -0.2	Significant Decrease ↓
1.13 Dry-to-dry machines installed <u>before</u> 12/9/91 have an external refrigerated condenser <u>OR</u> a carbon adsorber that was installed prior to 9/22/93?	-30.0	-40.8 - -19.2	Significant Decrease ↓

The lack of significant change of compliance from the baseline to post-certification inspections is most likely due to this sector’s on-going familiarity with the air related regulations. As stated previously, dry cleaners in Michigan are inspected annually for compliance with air regulations. For years the MDEQ has provided education and outreach to dry cleaners on the air related requirements. Therefore, it is no surprise that the compliance levels showed little change from baseline to post-certification inspections. The compliance questions that showed marked improvement can most likely be attributed to new federal regulations that came into effect during the implementation of this ERP and/or increased education that was provided to the sector on these requirements and existing requirements via the ERP. Specifically, the significant change seen in questions 1.5 and 1.23 may be correlated to the self-certification, since a large number a large number of Return to Compliance Plans that were submitted identified corrective action that was being taken on these specific items (see page 25 of this report).

Waste

There were 30 questions included in the waste component of the ERP. MDEQ identified three questions as EBPIs. The waste related questions and possible answers are identified in Table 7, with the EBPIs highlighted.

Table 7: Waste Management Questions		
3.1.	Does facility generate <u>less</u> than 220 pounds of hazardous waste per month?	<input type="checkbox"/> Yes <input type="checkbox"/> No Go to Part 4
3.2.	Does facility have a site ID number when needed for waste shipment? <i>(Choose N/A if waste not shipped off-site) TIP: Site ID should appear on all Uniform Hazardous Waste Manifests with MIK, MIR, MID MIT, MIE, MIO, or MIG prefix.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Skip to 3.7
3.3.	Does each shipment of hazardous waste or liquid industrial waste have a manifest or receipt from the waste hauler that identifies manifest number and the type and quantity of waste shipped?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.4.	Is the waste properly listed on the manifest form (e.g., F002) and is the quantity shipped entered on the manifest form?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.5.	Has a copy of each manifest been signed by the waste hauler and submitted to the MDEQ by the 10 th of the month following the shipment?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.6.	Are all copies of the manifest that are signed by the hauler and disposal facility kept on file for at least <u>3 years</u> ?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.7.	Is each storage container labeled with the name of the contents (e.g., perc waste, filters) and is the label readable? <i>Container may be labeled using purchased labels, a stencil, or the completed shipping label.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.8.	Is each container that is being shipped labeled according to the US DOT Shipping requirements? (e.g. does it have a completed US DOT shipping label?)	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.9.	Is less than 2,200 pounds (5 drums) of hazardous waste accumulated on site?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.10.	Are containers in good condition and kept closed except when adding or removing waste?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.11.	Is the exterior of the storage containers kept free of the liquid waste and its residue?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.12.	Are containers protected from the weather? If storing containers outdoors, they are placed on an impervious surface and protected from the elements.	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.13.	Are containers protected from fire and secure from vandalism and physical damage such as that caused by fork lifts or other equipment?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.14.	Are the containers compatible with the type of waste being stored in them and are containers that have wastes that could react with each other separated by a physical barrier, like a dike, berm, or wall, or by a safe distance?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.15.	Is there adequate aisle space for unobstructed movement of emergency equipment and personnel?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Table 7: Waste Management Questions (continued)	
3.16. If contents have a FP below 200° F, are they isolated according to local F.D. recommendations?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.17. If a leak or spill occurs does facility immediately stop and contain the leak and repair or replace the container?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.18. Have employees been trained on how to properly manage waste?	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.19. Does hazardous waste storage area have secondary containment such as a curb, ramped pad, dike, or containment room?	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.20. Doing any of the best management practices listed in Table 3.1 of the Self Audit Workbook?	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.21. Are hazardous wastes that are a liquid shipped to a licensed recycling, treatment, storage, or disposal facility?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.22. Is facility complying with the following requirements? <ul style="list-style-type: none"> • <u>Liquid</u> hazardous wastes are never disposed of in a dumpster, solid waste landfill, or incinerator. • Waste is not put into the municipal sanitary sewer system without authorization from local wastewater treatment plant. • Hazardous waste is not flushed into a septic tank, down a storm drain, into a stream, or on the ground. 	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.23. Is facility doing any of the following best management practices? <input type="checkbox"/> Hazardous wastes that are <u>solids</u> are disposed of in one of the following ways: <ul style="list-style-type: none"> • shipped to a licensed recycling, treatment, storage, or disposal facility • taken to a household hazardous waste collection site that is willing to accept your hazardous waste. <input type="checkbox"/> “ <u>Solid</u> ” hazardous wastes are not disposed of in a solid waste landfill, municipal waste incinerator, or in a dumpster.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.24. Does facility recycle fluorescent tubes, incandescent lamps, and/or dry cell batteries?	<input type="checkbox"/> Yes <input type="checkbox"/> No Skip to 3.27
3.25. Are fluorescent tubes, incandescent lamps, dry cell batteries, stored for recycling according to the following requirements? <ul style="list-style-type: none"> • Stored not over one year after generation. • Records are kept that show how long they have been stored using a method that clearly demonstrates how long they have been accumulated. • Waste is labeled or the container holding the waste is labeled with the following: “universal waste electric lamps,” “waste electric lamps,” “used electric lamps,” or “universal waste batteries,” “waste batteries,” “used batteries.” • Waste must be stored in a way that prevents any spills or releases. Containers must be kept closed, in good condition, and be compatible with the type of waste stored in the containers. • No more than 11,000 pounds of these wastes can be accumulated at any one time. 	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.26. Have employees who handle fluorescent tubes, incandescent lamps, and dry cell batteries, been informed about proper handling of these waste materials and any emergency procedures?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.27. Does facility do any of the following? <input type="checkbox"/> Recharge and use batteries that are still rechargeable. <input type="checkbox"/> Use low-mercury, energy-efficient fluorescent/HID light bulbs. <input type="checkbox"/> Keep recycling or disposal receipts for at least 3 years, and know who takes them to be recycled or disposed.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.28. Is all <u>solid waste</u> hauled to a recycling center or a licensed disposal facility, which includes: a landfill, incinerator, or a transfer/processing facility?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.29. Is waste stored in leak-proof, covered containers (e.g. covered dumpster)?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
3.30. Does facility recycle or reuse office paper, corrugated cardboard, wood pallets, 55-gallon clean drums, other containers, or scrap metal?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Analysis of the results from the baseline and post-certification inspections showed significant increases in compliance for several of the requirements. There was a significant increase in compliance for one EBPI (question 3.3) and several other non-EBPI questions. Not only were there marked improvements in compliance with the regulatory requirements but also with most of the best management practices (BMPs) that were included as part of the ERP. Table 8 identifies the requirements and BMPs that showed a significant increase in compliance.

The vast majority of dry cleaning establishments are conditional exempt small quantity generators; therefore, they are rarely inspected by the MDEQ for compliance with waste related questions. Historically, the MDEQ's Dry Cleaning Program has not verified compliance with waste related requirements. While it is not conclusive, we might assume that the increased outreach to this sector on waste related requirements may have led to these improvements in compliance.

Table 8: Waste Management Significant Changes in Compliance			
Question	Post-Certification minus Baseline Designed based estimates		
	Change in Proportion	90% Confidence Interval	Change Between Rounds
3.1 Does facility generate <u>less</u> than 220 pounds of hazardous waste per month?	15.1	11.9 – 18.3	Significant Increase ↑
3.3 Does each shipment of hazardous waste or liquid industrial waste have a manifest or receipt from the waste hauler that identifies manifest number and the type and quantity of waste shipped?	8.2	3.8 – 12.6	Significant Increase ↑
3.4 Is the waste properly listed on the manifest form (e.g., F002) and is the quantity shipped entered on the manifest form?	13.5	9.8 – 17.2	Significant Increase ↑
3.5 Has a copy of each manifest been signed by the waste hauler and submitted to the MDEQ by the 10 th of the month following the shipment?	11.6	7.0 – 16.2	Significant Increase ↑
3.6 Are all copies of the manifest that are signed by the hauler and disposal facility kept on file for at least <u>3 years</u> ?	5.4	0.3 – 10.5	Significant Increase ↑
3.7 Is each storage container labeled with the name of the contents (e.g., perc waste, filters) and is the label readable? <i>Container may be labeled using purchased labels, a stencil, or the completed shipping label.</i>	10.9	6.3 – 15.6	Significant Increase ↑
3.8 Is each container that is being shipped labeled according to the US DOT Shipping requirements? (e.g. does it have a completed US DOT shipping label?)	13.7	9.7 – 17.7	Significant Increase ↑
3.15 Is there adequate aisle space for unobstructed movement of emergency equipment and personnel?	0.8	0.0 – 1.6	Significant Increase ↑
3.18 Have employees been trained on how to properly manage waste?	18.9	14.9 – 22.9	Significant Increase ↑
3.20 Doing any of the best management practices listed in Table 3.1 of the Self Audit Workbook?	12.2	8.1 – 16.3	Significant Increase ↑

Table 8: Waste Management Significant Changes in Compliance (continued)			
Question	Post-Certification minus Baseline Designed based estimates		
	Change in Proportion	90% Confidence Interval	Change Between Rounds
3.23 Is facility doing any of the following best management practices? <ul style="list-style-type: none"> <input type="checkbox"/> Hazardous wastes that are <u>solids</u> are disposed of in one of the following ways: <ul style="list-style-type: none"> • shipped to a licensed recycling, treatment, storage, or disposal facility • taken to a household hazardous waste collection site that is willing to accept your hazardous waste. <input type="checkbox"/> “Solid” hazardous wastes are not disposed of in a solid waste landfill, municipal waste incinerator, or in a dumpster. 	11.0	8.7 – 13.4	Significant Increase ↑
3.24 Does facility recycle fluorescent tubes, incandescent lamps, and/or dry cell batteries?	12.3	9.1 – 15.5	Significant Increase ↑
3.26 Have employees who handle fluorescent tubes, incandescent lamps, and dry cell batteries, been informed about proper handling of these waste materials and any emergency procedures?	30.9	2.9 – 58.8	Significant Increase ↑
3.30 Does facility recycle or reuse office paper, corrugated cardboard, wood pallets, 55-gallon clean drums, other containers, or scrap metal?	24.8	20.8 – 28.8	Significant Increase ↑

Wastewater

There were 13 questions pertaining to compliance with the wastewater requirements. MDEQ identified one question as an EBPI. This EBPI was actually a combination of several questions 5.01 – 5.03 to determine if the wastewater that was generated by the facility was disposed of properly. The wastewater related questions and possible answers are identified in Table 9 (the EBPI is highlighted).

Table 9: Wastewater Questions	
5.1. Is facility connected to a sewer system that goes to a wastewater treatment plant?	<input type="checkbox"/> Yes <input type="checkbox"/> No Skip to 5.6
5.2. Facility empty wastewater from any dry cleaning machine into a drain, toilet, or sink?	<input type="checkbox"/> Yes <input type="checkbox"/> No Skip to 5.4
5.3. Does facility have permission from the wastewater treatment plant to dispose of wastewater from dry cleaning machine into the sewer system?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does facility dispose of wastewater from dry cleaning machine properly? This question was not asked in surveys but is based on a combination of questions 5.2 and 5.3 to serve as an EBPI to determine if wastewater that is sent to sewer is disposed of properly (see note at the end of this table).	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.4. Facility empty wastewater from laundry area, air compressor, boiler, vacuum, or floor cleaning into a drain, toilet, or sink?	<input type="checkbox"/> Yes <input type="checkbox"/> No Skip to 5.6
5.5. Does facility have permission from the wastewater treatment plant to dispose of wastewater from laundry area, air compressor, boiler, vacuum, or floor cleaning into the sewer system? (e.g., permit, letter, or written authorization from WWTP)	<input type="checkbox"/> Yes <input type="checkbox"/> No

Table 9: Wastewater Questions (continued)		
5.6.	Does facility use an evaporator device to dispose of wastewater?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.7.	Is any wastewater collected in a holding tank?	<input type="checkbox"/> Yes <input type="checkbox"/> No Skip to 5.9
5.8.	Is wastewater that is collected in holding tank disposed of by a licensed and registered hauler?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.9.	Does any wastewater from facility go to a septic system?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.10.	Does facility empty wastewater from dry cleaning machine, laundry area, air compressor, boiler, vacuum, or floor cleaning onto the ground, storm sewer, steam, or ditch?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.11.	Are there any floor drains in facility?	<input type="checkbox"/> Yes <input type="checkbox"/> No Go to Part 6
5.12.	Do they empty to the sewer system that goes to a WWTP or a holding tank?	<input type="checkbox"/> Yes Go to Part 6 <input type="checkbox"/> No
5.13.	Have floor drains that empty to a storm sewer, stream, or ditch been plugged with concrete or a locked down cement cap so that they are inaccessible and unusable?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>Questions 5.1, 5.2, and 5.3 determine whether establishments are improperly emptying wastewater into drains that flow to wastewater treatment plants. Establishments that are connected to a sewer system (i.e., they answered "Yes" to 5.1) are considered in compliance if (1) they do not empty wastewater in a drain (they responded "No" to 5.2) or (2) for those that do empty wastewater in a drain, they have permission to do so (they answered "Yes" to 5.03). The combination of 5.2 and 5.3 is "Yes" if they answered "No" to 5.2 or if they answered "Yes" to both 5.2 and 5.3. It applies only to establishments with drains connected to sanitary sewers (i.e., that answered "Yes" to 5.1).</p>		

Historically this sector has not been questioned on their wastewater disposal practices nor do they have much knowledge of what is allowed and prohibited. Wastewater that is disposed of from a business to a sewer system is not regulated by the MDEQ but rather the local wastewater treatment plant (WWTP). Awareness of wastewater disposal requirements is largely dependent on the outreach and enforcement efforts of the WWTP. The compliance assistance provided via the ERP most likely increased awareness of these requirements. Analysis of the data collected showed significant increases and decreases between rounds for several of the questions. Table 10 shows for which questions a significant change between rounds was observed.

Table 10: Wastewater Significant Changes in Compliance				
Question	Post-Certification minus Baseline Designed based estimates			
	Change in Proportion	90% Confidence Interval	Change Between Rounds	
5.2	Facility empty wastewater from any dry cleaning machine into a drain, toilet, or sink?	-9.9	-14.5 – -5.3	Significant Decrease ↓
5.3	Does facility have permission from the wastewater treatment plant to dispose of wastewater from dry cleaning machine into the sewer system?	-17.0	-27.3 – -6.7	Significant Decrease ↓
5.2 & 5.3	Does facility dispose of wastewater from dry cleaning machine properly? This question was not asked in surveys but is a based on a combination of questions 5.2 and 5.3 to serve as an EBPI to determine if wastewater that is sent to sewer is disposed of properly (see note at the bottom of this table).	4.3	0.3 – 8.3	Significant Increase ↑

Table 10: Wastewater Significant Changes in Compliance (continued)			
Question	Post-Certification minus Baseline Designed based estimates		
	Change in Proportion	90% Confidence Interval	Change Between Rounds
5.4 Facility empty wastewater from laundry area, air compressor, boiler, vacuum, or floor cleaning into a drain, toilet, or sink?	9.5	6.7 – 12.3	Significant Increase ↑
5.7 Is any wastewater collected in a holding tank?	-35.1	-36.8 – -33.4	Significant Decrease ↓
5.8 Is wastewater that is collected in holding tank disposed of by a licensed and registered hauler?	-41.2	-51.8 – -30.6	Significant Decrease ↓
5.9 Does any wastewater from facility go to a septic system?	-2.6	-4.5 – -0.6	Significant Decrease ↓
5.10 Does facility empty wastewater from dry cleaning machine, laundry area, air compressor, boiler, vacuum, or floor cleaning onto the ground, storm sewer, steam, or ditch?	-4.3	-6.8 – -1.8	Significant Decrease ↓
5.11 Are there any floor drains in facility?	16.4	11.9 – 21.0	Significant Increase ↑
5.12 Do they empty to the sewer system that goes to a WWTP or a holding tank?	3.6	1.3 – 5.9	Significant Increase ↑

The mix of increased and decreased change is primarily due to the design of the questions in this part of the audit. For many of the wastewater questions, the correct or “good” answer was “No” as opposed to “Yes,” which is the case throughout the rest of the survey. This means a significant decrease is actually good or desired for questions 5.2, 5.4, 5.9, 5.10, and 5.11. For example, question 5.2 asks if the facility empties wastewater from their drycleaning machine to a drain, toilet, or sink. The desired answer is “No” so a significant decrease between the baseline and post-certification inspections is good because it means that there was a decrease in the number of facilities that disposed of wastewater in this manner, which is not desired.

Some of the questions do not relate to compliance but rather are exclusionary questions such as 5.11, which asks whether or not there are floor drains in the facility. It is preferred that the facility does not have floor drains so “No” is the desired answer; however, if a facility answers “Yes” it doesn’t mean they are not in compliance. It simply identifies that they should answer the next two questions related to floor drains. So, if a facility answers “Yes” to question 5.11 and “Yes” to questions 5.12 to 5.13 that is desired and is the “good” response (i.e., they have floor drains but they are operating properly).

The decrease in the number of sources that did not have permission to dispose of wastewater from their drycleaning machine to their WWTP (question 5.3) may be attributed to increased awareness of this requirement after the baseline assessment. Prior to the ERP few, if any, sources had ever considered this requirement. As a result, many sources did not realize they did not have the required permissions. It should be noted that several of the return to compliance plans submitted to the MDEQ identified this requirement as a non-compliance issue and subsequently contacted their WWTP to obtain permission. Looking at the combined EBPI, it does appear that there was ultimately a significant increase in the number of sources that disposed of their wastewater properly. This may be because, upon learning about the requirements, a number of sources either stopped disposing of waste water from their machine to the sewer or sought out and received the required approval.

According to question 5.4, there was an increase in the number of facilities that reported they empty wastewater from laundry area, air compressor, boiler, vacuum, or floor cleaning into a drain, toilet, or sink. This was rather unexpected; however, it could be due to increased awareness by both the

facilities and inspectors with regards to the numerous emission points in the facility and the methods of disposal that are allowed. A number of facilities may have obtained permission from their WWTP to dispose of this wastewater as a result of the audit and then began disposing of wastewater to the sewer system that may have not been disposed of there before. This change could also simply be due to the sample selected and the resulting differences in operating practices between those in the baseline and post-certification samples.

Self-Certification

Of all the self-certification packages that were sent to all facilities in August 2007, 496 certifications were returned, which is approximately 58% of the drycleaners in the state. Results from each of the questions are shown on page A-22 of Appendix A.

Based on the results submitted, it appears that facilities believed themselves to be achieving a very high level of compliance with almost all of the requirements identified in the certification. In fact, according to the facility results, over 95% of the facilities judged themselves to be in compliance with 37 of the 95 questions. These results are significantly different than those observed by the inspectors in the baseline and post-certification inspections, which showed the compliance levels to be much lower for all the questions. Table 11 identifies each of the EBPIs and compares the percentage of facilities identified as in compliance during the facility-scored self-certifications and the inspector observed post-certifications.

Table 11: Comparison of Self-Certification and Post-Certification EBPI Results		
EBPI	Self-Certification Proportion in Compliance	Post-Certification Proportion in compliance
1.4 Does facility keep a log of the gallons of perc purchased each month?	98.7	62.7
1.7 Are specified components of the machine inspected weekly/bi-weekly for perceptible leaks?	98.3	75.8
1.19 Is the outlet temperature of the vapor stream passing through the cooling coil (refrigerated condenser) read weekly and is it equal to or less than 45deg F (±2 F) or 7.2deg C (±1.1degC)?	98.7	77.0
3.3 Does each shipment of hazardous waste or liquid industrial waste have a manifest or receipt from the waste hauler that identifies manifest number and the type and quantity of waste shipped?	98.1	87.7
3.10 Are containers in good condition and kept closed except when adding or removing waste?	100.0	94.5
3.22 Is facility complying with the following? -Liquid haz waste not disposed of in dumpster, landfill, incinerator -Waste not put into municipal sanitary sewer without WWTP authorization -Haz waste not into septic tank, storm drain, into stream or ground	99.3	97.6
5.2 Does facility dispose of wastewater from dry cleaning machine properly? <i>This question was not asked in surveys but is a based on a combination of questions 5.2 and 5.3 to serve as an EBPI to determine if wastewater that is sent to sewer is disposed of properly</i>	97.6	88.0

This disparity may be due to several factors, including the likelihood that the facility interpreted a question differently or less strictly than an inspector; misunderstood a question; or feared that showing non compliance would result in enforcement. While it may be expected that a facility would judge itself easier than a trained inspector, this disparity is something that should not be ignored. Regulators

should be aware that the results from self-certifications may not be as accurate as what may be observed by trained inspectors. This reinforces the importance of conducting targeted inspections of self-certifiers to verify submitted data, in addition to random inspections of non-certifiers. Of course, this was the first time this sector was ever given the opportunity to self-certify compliance. It might be assumed that as facilities become more comfortable with the self-certification process and more knowledgeable of the requirements, facility and inspector scored results will be more closely aligned.

Regardless of the difference in results, corrective action was taken at several facilities after completing the self-certification. A total of 200 Return to Compliance (RTC) plans were submitted to the MDEQ to correct various violations cited throughout the certifications. The majority of RTC plans submitted were to correct air quality related violations (104). The chart to the right shows the percentage of air, waste, wastewater related RTC plans submitted.

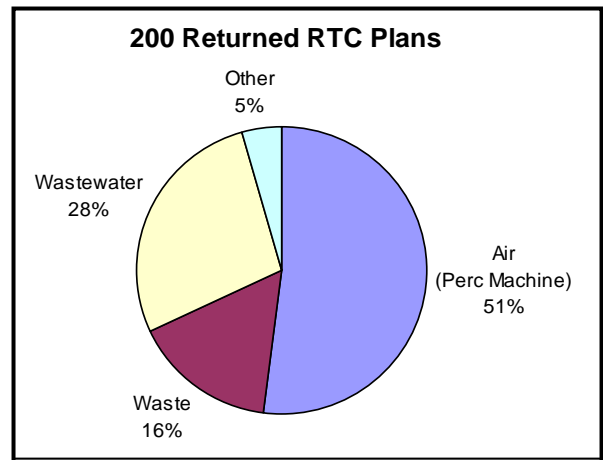
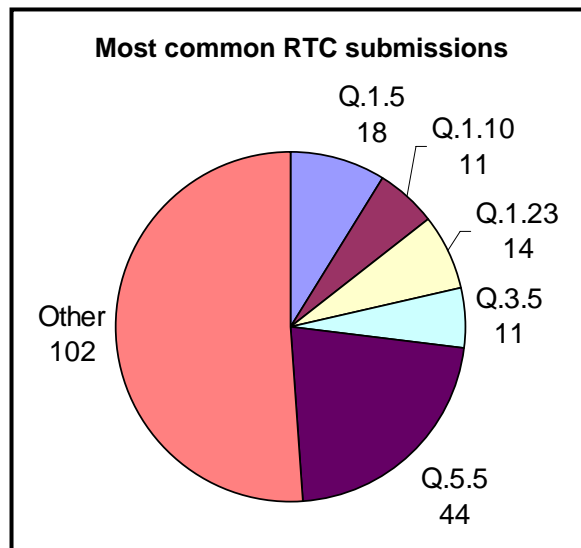


Table 12 identifies for which requirements the largest number of RTC plans were returned.

Table 12: Most Common RTC Submissions	
Question	Number of RTC Plans Returned
1.5 Are all perc purchase logs kept on file for five years?	18
1.10 does facility keep a log of the date of any necessary repairs made to the machine?	11
1.23 Is the date, temperature sensor or pressure gauge monitoring results kept on file for five years?	14
3.5 Has a copy of each manifest been signed by the waste hauler and submitted to the MDEQ by the 10th of the month following the shipment?	11
5.5 Does facility have permission from the wastewater treatment plant to dispose of wastewater from laundry area, air compressor, boiler, vacuum, or floor cleaning into the sewer system? (e.g., permit, letter, or written authorization from WWTP)	44



OBSERVATION AND RECOMMENDATIONS

During the implementation of Michigan's Drycleaning ERP, we made several observations that we feel contributed to the overall outcome of this project. The observations below are not only interesting but also fairly common among ERPs. Unfortunately, there is probably no way to measure the compliance changes associated with them.

Problems with baseline inspection protocol: We conducted baseline inspections in 2006. Our sampling strategy identified the facilities that were supposed to be inspected within a specified window of time (July – December). Normally, the dry cleaning inspectors visit every facility annually. Facilities are selected based on the length of time since their last inspection (i.e. if a facility was inspected the previous year in March the inspector will try to conduct the next year inspection in March). The baseline inspection protocol required that the inspectors hold off conducting inspections of those selected for ERP baseline inspections until the window opened. Unfortunately, the importance of this “inspection window” was not communicated clearly to the inspectors and as a result a number of the facilities that were supposed to be inspected as part of the baseline were conducted early (before the window opened). This error was not discovered until reviewing the data with EPA's ERP consultant, while compiling data for the 2008 ERP States Produce Results Report. Ultimately, we decided to remove a significant amount of data from the baseline sample to ensure statistical validity. What was once a sample of 311 sources became 262. Fortunately, the problem was discovered soon enough so we could make the necessary adjustments to our data and better prepare our inspectors for the post-certification inspections.

Change Data Collection Method: One of the biggest lessons learned was in regards to how we collected the self-certification data. We spent a great deal of time developing the forms so that they could be read by an optical scanner. We had anticipated that this portion of our new software would be complete by that time. Unfortunately, the software program was not yet available so it wasn't necessary that we do this. Also, after we received the first few responses back we discovered that using an optical scanner would be a lost cause anyway due to the fact that many respondents wrote all over the forms and had numerous stray marks, even though we provided detailed instructions on how to complete the forms. If we were to choose to use a scanning device, we would have to provide even more explicit instructions or use a bubble sheet to record answers so as to limit any stray marks. During meetings with our Department of Information Technology, we also learned of a new tool they had available that would allow us to collect the self-certification data over the internet using Web-based survey software. We were unaware of the availability of this software during the early development stages of the certification forms. If we are to do another self-certification, I would recommend collecting the data using the web-based software.

Capturing Improvements by Non-Responders: During the self-certification period, a drycleaner contacted MDEQ and asked if submitting the audit was mandatory. When he was told that it was voluntary, he explained that he didn't think he was complying with one of the air requirements related to air pollution control equipment and therefore didn't want to submit the form. Even if the cleaner did not submit the form, he became aware of the requirements and will hopefully make changes. This is believed to be a very common scenario. When a facility does not submit the form or chooses to not answer truthfully, there is no way of capturing whether or not a change was actually made due to their findings. I assume that if any changes were made it would be positive (i.e. a person would not choose to start not complying with a requirement if they were already complying with it).

Better Understanding of Regulations: Some facilities needed to be walked through the self audit. For the most part, these were people that were new to the business and had very little knowledge of the requirements they were subject to or why they were doing some of the recordkeeping they have always done (many establishments are handed down to different family members who do not know very much about dry cleaning regulations). In doing the audit, they learned more about their

requirements and were able to do so anonymously. The self-certification does not capture how much additional knowledge is gained by the respondent, just whether or not they are complying. We don't ask for their knowledge level of the requirements or dry cleaning system prior to completing the self-certification nor do we capture what additional things they may have learned as a result of completing the forms, such as what a halogenated hydrocarbon detector is or why they have to check certain gauges on their machine.

A couple inquiries came in regarding question 1.19, which is a requirement to do a weekly temperature reading of refrigerated condenser. One of the cleaners had been doing readings but didn't know why and wasn't keeping the records in a log. The other cleaner hadn't been doing it at all and wanted to know more. I sent both a recordkeeping guidance form that explained the requirements and how to keep the log. The self-audit introduced the requirement to them and provided them with the opportunity to ask for more information anonymously.

Synergy between Agency, Trade, and Facilities: During a presentation, a picture of a secondary containment pad was displayed to illustrate an example of good containment. One attendee asked what it was and where he could get one of those pads. Several people in the audience provided some resources. MILD volunteered to help to help locate information on the unit and get the details to members. Here, the ERP provided an opportunity for some unexpected synergy between the MDEQ, facilities, and the trade association, not to mention the potential implementation of a best management practice.

Improvement in Multi-Media Compliance Assistance: Prior to the self-certification, almost all sources were unaware that to be considered a conditionally exempt small quantity generator (CESQG), and consequently subject to less regulation, you had to be able to show that your monthly hazardous waste generation is below 220 lbs. After doing the audit or attending a presentation, facilities learned how to demonstrate their waste generation in a way that would be satisfactory to inspectors.

Several questions came in regarding getting approval to dispose of process wastewater to the sewer system. Discharges to sewer system are regulated by local wastewater treatment plants, not MDEQ, so very few knew about this requirement. Because of the audit, dry cleaners have initiated contact with their local sewer authority to verify if any permits or authorizations are required to dispose of wastewater.

The revised federal NESHAP requires that all cleaners conduct monthly leak detection using a halogenated hydrocarbon detector. While some cleaners knew about this upcoming requirement, many did not. The workbook and training sessions (on-line and live) provided cleaners with information on this new requirement.

Unintended Negative Outcomes to Compliance Assistance: During the meetings with facilities, we experienced some possible unintended negative outcomes that may have resulted from educating facilities. Specifically, many facilities are unaware that legally they are allowed to dispose of their "solid" hazardous waste in their dumpster if they generate less than 220 lbs hazardous waste/month. A lot of facilities assumed that all hazardous wastes from their dry cleaning process must be disposed of by a hazardous waste hauler, which is a best management practice (recommended). We explained the particulars of what was considered a "solid" hazardous waste and that some landfills may still not accept it; however, we felt that some facilities still left with the impression that this was a cheaper (better) disposal option. As a result of educating them on the regulations, we may have actually deterred some facilities away from a best management practice they were unknowingly doing already.

Misinterpretation of Questions: One facility noted during a phone call for assistance that he did not understand what we meant when we stated "recommended" under the response to some of the

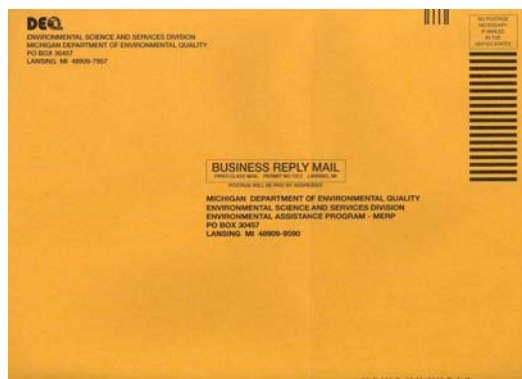
questions. He asked if this meant that we recommend the activity or recommend the facility answer “No” to the question (see below). This was a great observation that I had not considered. I will most likely change this in future versions.

3.31. Are you doing any of the best management practices listed in Table 3.1 of the Self Audit Workbook? Yes No
Recommended

Are we recommending they choose “No” for this question?

Better than Expected Return Rate of Self-Certification Forms: The MDEQ received self-certification data from approximately 58% of the dry cleaning establishments in Michigan. This far exceeded our expectations considering the self-certification was voluntary. There are a few factors which we believe contributed to this high rate of return:

- Successful partnership between MDEQ and dry cleaning associations. MILD and KDA encouraged members to complete and submit the forms to MDEQ. Both associations advertised the program in their publications, included information during meetings, and organized several workshops to assist members with the completion of the audit forms.
- Development of a Korean version of the form. A significant number of dry cleaning establishments in Michigan are Korean owned/operated. MDEQ believes that the availability of a Korean version of the audit form made these individuals more likely to complete the forms and also improved our relationship with this community through our willingness to accommodate their needs by addressing the language barrier.
- Inclusion of a self addressed, postage-paid envelope with the self-audit package. This industry has been hard hit by Michigan’s economic downturn and most establishment owners/operators have very little time to complete the audit. We believe that including this envelope made it much easier for users to submit the audit materials.
- Sector’s familiarity and trust of MDEQ Dry Cleaning Program. As stated previously, Michigan drycleaners are inspected regularly for compliance with air quality regulations by the MDEQ. In most cases the interactions between facility and inspector is positive and helpful. This relationship most likely played a big role in this sector’s willingness to complete and submit the self-certifications.



Postage Paid Return Envelope

FUTURE OF DRY CLEANING ERP IN MICHIGAN

The MDEQ Dry Cleaning Program was vital to the success of this project and they contributed significantly to the development of the guidance materials and collection of data in the field. The inspectors involved were able to quickly learn and incorporate the multi-media aspects of the ERP into their inspections. It is evident that the multi-media element incorporated as a result of the ERP may have increased this sectors knowledge and compliance with waste and wastewater regulations. As a result, the inspectors in this program have incorporated waste and wastewater compliance questions into their traditional air quality inspections.

At this time, the use of ERP to manage this sector or others in Michigan remains uncertain. Currently, there is not sufficient support at the upper level of management to extend this program to other sectors or programs within the department. Severe economic strains on the department have made it difficult to incorporate new methods of compliance verification that are not as tried and trusted as traditional approaches. The MDEQ currently inspects sources by media (air, waste, water). The implementation of an ERP requires that some inspection resources be shifted to a multi-media protocol. As with other states, management in MDEQ must be convinced that this shift in resources and inspection protocol is cost effective and ultimately the best use of the limited inspection resources available. While support is currently weak, we are confident that the Michigan dry cleaning ERP pilot serves as a model for how to successfully manage a sector or program with limited resources. As programs are cut and reduced and inspection priorities change, the dry cleaning ERP model will remain as an alternative approach to providing compliance assurance. Michigan now knows what it takes to implement a successful ERP, as we have a model on which to base our assumptions. However, it is going to take a vested interest by management and field staff to make this approach a reality. We plan to share our results from this program with department management in the coming months in hopes that further support and interest will be generated.

On a larger scale, Michigan is actively participating in a Regional ERP targeted to auto body facilities in the U.S. EPA's Region 5. Michigan is using it practical experience in ERP to assist in the planning and implementation of this first-of-its-kind endeavor. The work by states and the region to implement a number of pilot ERP programs will hopefully prove the effectiveness of this tool and result in increased interest at both the state and federal level.

FINANCIAL SUMMARY

The MDEQ received the SIG from the US EPA in 2005 to implement an Environmental Results Program for the Dry Cleaning Sector. The grant awarded was \$199,200. The state of Michigan was obligated to match 33% of the awarded amount awarded - \$100,000. Michigan chose to allocate personal and fringe expenses to the match as well as some costs identified under "Other," which are also personnel related but for information technology services.

The MDEQ did not use the entire awarded grant amount of \$199,200 to fulfill the grant obligations. Efficiencies were achieved in several areas such as supplies, which accounted for a significant budgetary savings. \$125,870 was allocated for the development of the data management system described earlier in this report and in Appendix B of this report. The costs associated with this task were also less than expected (\$121,670), which also accounted for significant savings.

The MDEQ funded portions of the project did exceed expected costs. The biggest unexpected expenditure came from the charges incurred upon us by our Department of Information Technology for the assistance they provided in managing and coordinating the data management system. The majority of these charges were incurred by the MDEQ and were more than expected due to the complicated nature of the project and several unexpected delays. The state was required to provide a match of 34% or \$100,000. The match was met and exceed through the personal and fringe benefits and expenditures for IT services listed under "Other." Table 5 shows actual expenditure incurred by MDEQ even after match was met.

Item	Approved Grant Amount	MDEQ Expenditure	SIG Expenditure	Actual Total
Personnel	78,000	61,366.61	9,009.44	70,376.05
Fringe	34,000	33,290.67	4,627.97	37,918.64
Travel	4,200	7.25	4,048.88	4,056.13
Supplies	29,500	4.41	27,642.78	27,647.19
Contractor	125,870	0	121,670.00	121,670.00
Other	6,545	20,863.29	10,494.51	31,357.80
Total Direct	278,115	115,532.23	177,493.58	293,025.81
Indirect	21,085	13,973.81	2,066.07	16,039.88
Total Federal share (66%)	199,200	-	179,559.65	179,559.65
Total State Share (34%)	100,000	129,506.04	-	129,506.04
Total	299,200	129,506.04	179,559.65	309,065.69