FINAL REPORT

Pollution Prevention (P2) Grant: NP - 9727505-0
"Continuing to Educate Schools on How to Be Mercury Free in New York State"

The New York State Department of Environmental Conservation (DEC), in conjunction with staff from the Northeast Waste Management Official's Association (NEWMOA) conducted ten, half-day workshops in West Seneca, Olean, Watertown, Malone, Saratoga Springs, Norwich, Ithaca, Elmira, Lakeville, Binghamton from the time period September, 2006 to May, 2007. (See Attachment A) This current outreach effort was an effort to expand on our earlier outreach to schools in the Syracuse, Rochester, Albany, NYC and Long Island areas; reaching beyond urban centers to more suburban and rural areas of the state.

The goal of these workshops was to promote the elimination of mercury in schools. This message was targeted to school administrators, science teachers, health and safety coordinators, building and grounds personnel and school nurses. In the course of these workshops, we educated the participants on how to identify, inventory, collect and remove/recycle elemental mercury and mercury-containing items from their schools. The workshops also included discussion about the health hazards associated with mercury exposure, what to do in the event of a mercury spill, New York State mercury legislation and how to go about replacing their mercury-containing items with mercury-free alternatives.

Informational handouts, brochures, and a mercury inventory chart which were previously produced were used as aids for the mercury workshops. A poster which was also previously produced was also used during our mercury outreach workshops. The mercury poster is called "*Mean, Mad, Mercury*" and was also produced in Spanish, "Mercurio, Loco, Loco." 10,000 posters were produced: 8000 in English and 2000 in Spanish. Approximately a total of 2500 posters were distributed at these ten workshops as a classroom aid to promote awareness of the hazards of mercury. Considering that 10 percent of mercury spills at school are caused by students, secondary school students were the target audience for these posters. A copy of these posters as well as copies of the handouts and brochures used at these workshops are attached to this report. (See Attachment B)

NEWMOA was identified in the grant as our partner in conducting the workshops. A contract was developed and negotiated with NEWMOA to finalize this partnership with DEC. It was essential that we partner with NEWMOA, as their staff had already developed valuable experience on working with mercury removals from schools in Massachusetts. Over the past four years, NEWMOA has worked with 103 Massachusetts schools to remove over 850 pounds of mercury. Through these outreach efforts, NEWMOA has educated hundreds of teachers, school administrators, school nurses and students about the health and environmental hazards of mercury, and the importance of preventing future use of mercury in schools. NEWMOA's expertise was called on to not just educate school personnel, but also to train DEC staff on the methods and pros and cons, that they have learned.

Our staff at DEC also collaborated closely with the health & safety officers from the county Board of Cooperative Educational Services (BOCES) organizations, who provide us with accommodations at their facilities for our workshops and assisted us with getting the word out to

school personnel. BOCES is a public organization that was created by the New York State Legislature in 1948, to provide shared educational programs and services to school districts. BOCES helps school districts save money by providing opportunities to pool resources and share costs. Sharing is a very economical way for districts to provide programs and services that they might not be able to afford otherwise.

The following agenda which was developed and implemented at all ten workshops, provided a consistent format to present detailed information about mercury to all workshop participants.

Mercury-Free Schools in New York State
Agenda

Introduction: Why focus on getting mercury out of schools?
- Numerous mercury spills at schools; clean-up expensive
- Mercury's health effects
- It's required by NYS law (i.e. Chapters 145, 676)
- Mercury elimination is a good progression to comprehensive chemical management

Background information on mercury
- Mercury's properties–why it is so useful
- Toxicity of mercury, neurological and developmental impacts
- Mercury cycle in the environment
- Sources of mercury
- Routes of exposure
- Fish advisories, FDA, NYDOH findings

Where is mercury found in schools
- Examples of mercury-containing items
- Where in schools mercury can be located
- Surprise locations

Current New York State Mercury Legislation
- Chapter 145
- Chapter 676

Current New York State Environmental Regulations
- Universal Waste Rule
- NYS Hazardous Waste Regulations

Getting a mercury clean-out program started
- Who to involve
- Coordinating a mercury team, elements for success
- Conducting the mercury inventory
- Collection materials needed
- Pitfalls to avoid
- Arranging the hazardous waste pick up
- How to save on costs
- Potential sources of funding

Mercury Clean Outs in Rochester and Albany School Districts
- A demonstration pilot

Mercury-Free Alternatives
- Examples and how they work
- Advantages/disadvantages
- Vendors

Mercury Spills
- Spill clean up guidance
- Hands on exercise

Workshop Attendance

Attendance was modest, ranging from 6 to 22 people. Key players in the school administration were, however, represented, with each person disseminating the information they gained at these workshops to their respective school districts. The workshop's message had a greater impact than the attending numbers would indicate. In a large part, this was due to the efforts from the health & safety officers from BOCES, who provide services to many schools districts in their respective counties. For example, at the West Seneca workshop location, only seven health & safety officers were present from the Erie 1 BOCES, Erie 2 BOCES and City of Buffalo Board of Education; however, each attendee represented many schools. Erie 1 (5 people) represented 20 schools, Erie 2 (1 person) represented 28 schools and the City of Buffalo (1 person) represented over 70 schools in Erie, Niagara and Orleans counties .

The predominant audience in attendance for these workshops were buildings and grounds personnel, with a minority of the attendees divided amongst BOCES health and safety officers, science teachers, school principals, business office administrators, chemical hygiene officers, environmental education specialists, school and DEC regional engineers.

Refer to "Attachment C" to review the attendee list from the aforementioned ten workshops.

Outcomes from the Workshops:

The following information was gathered from inputs from the mercury workshops, via workshop evaluations forms, audience comments, and from a follow-up mercury workshop survey (10% response received from surveys) and phone calls to the county BOCES.

West Seneca

This workshop drew in schools representatives from Erie, Orleans and Niagara counties in Western New York State. Erie county has a major metropolitan area, the City of Buffalo, as well other cities of notes, such as Lakawanna and Tonawanda. Niagara county's cities of note are Lockport, Niagara Falls and North Tonawanda. Other schools outside of these urban areas are a mix of suburban and rural districts.

There was strong interest and many questions asked about the New York State Universal Waste Rule and Hazardous Waste Regulations at the workshop. There was agreement by the participants that the workshop heightened their mercury awareness, that the workshop was informative and had practical application. The post-workshop follow-up revealed that most participants did distribute the information gathered at the mercury workshops to their school districts. If the workshop did not exactly spur many mercury clean out at schools in these counties, it did elicit interest in initiating mercury inventorying.

Olean

The participants for this mercury workshop came from Chautauqua, Cattaraugus and Allegany counties. The city of Olean is the only city of note in an area that is predominantly agrarian/rural in character. Feedback from our workshop evaluations indicated a strong positive reaction to information gained from the mercury workshop and an increased awareness about the hazards of mercury in schools. . Feedback from the post-workshop mercury survey indicated that the

information gathered at the workshop was distributed through the school districts.
Post-workshop contact with our BOCES contact in Olean indicated that some of the schools that attended the mercury workshop did go back and identified mercury at their schools, contacting the BOCES for information about removal. A total of 15 pounds of various types of mercury were removed from 7 schools in this region. The breakdown is as follows:

Name of School	**Amount of Mercury Removed**	**Types of Mercury**
Andover	.75 lb 10 grams	Mercury compounds Elemental
Belfast	.5 lb, 50 grams 1.25 lbs, 1 gram	Mercury compounds Elemental
Friendship	1 lb.	Elemental
Olean City Schools	1 lb. 50 grams 1 lb.	Mercury compounds Mercury Lab Thermometers Elemental
Pioneer	.25 lb 50 grams 1 lb.	Mercury compounds Mercury Lab Thermometers Elemental
Scio	.25 lb 5 lbs.	Mercury compounds Elemental
Wellsville	.25 lb 50 grams 1 lb, 10 grams	Mercury compounds Mercury Lab Thermometers Elemental

Mercury removal was carried out as part of the school's annual chemical clean out. The chemicals and mercury from these aforementioned schools were disposed of through the DEC's Clean Sweep Program. DEC developed the Clean Sweep Program as an environmental benefit project by using money from settlements reached in the state's pesticide program to ensure that pesticides, which can be hazardous to nearby natural resources if incorrectly stored or disposed of, are correctly handled. In addition to collecting pesticides, the Clean Sweep Program also accepts mercury for disposal by schools. DEC held its spring Clean Sweep Program in five western New York counties in 2006.

Watertown

Participants for this mercury workshop represented school districts from predominantly rural Lewis and Jefferson counties, with one large city school district of note, in Watertown. Post-workshop follow up revealed that many of the participants found the workshop very informative, with good handouts that they could distribute around their school districts. General agreement was that the workshop did increase their mercury awareness. The mercury workshop did spur significant mercury clean outs at nine school districts, with a total of 116.5 pounds of various types of mercury removed.

The breakdown from these mercury clean outs are as follows:

Name of School	Total Amounts of Mercury Removed	Types of Mercury
Heuvelton	4 lbs.	Elemental, Mercury Compounds and Devices
General Brown	31 lbs.	Elemental, Mercury Compounds and Devices
Hammond*	20 lbs.	Elemental and Mercury Devices
Tupper Lake*	11 lbs.	Elemental, Mercury Compounds and Devices
Mexico	7 lbs.	Elemental, Mercury Compounds and Devices
Harrisville	21 lbs.	Elemental and Devices
Haninord	.5 lbs	Mercury Compounds
Belleville	20 lbs.	Mercury Devices
Parishville	2 lbs.	Mercury Devices

* These school districts disposed of their mercury through the NYS DEC Clean Sweep program

In most school districts, mercury-free alternatives/devices replaced the mercury-containing devices. The Watertown City School district reported that their district had made an effort to eliminate mercury for the past two years.

Malone

One of our smallest workshops, attended by representatives from a predominantly rural, low population density Franklin, Essex, Hamilton counties in the Adirondack Mountains region. Malone is the only city of note in the region. Although there were only six workshop participants, they represented over half of the school districts for Franklin County.

This was an area that had very little prior knowledge about the hazards of mercury, and post-workshop follow was extremely positive about the knowledge gained from the mercury workshops.

Feedback from our workshop evaluations and follow-up survey indicated that mercury awareness was heightened and the mercury workshop handouts were distributed to the participant's school districts. According to our BOCES contact, our mercury workshop did spur mercury clean outs in the nine school districts that the Franklin Essex Hamilton BOCES provides services to. They reported that elemental mercury and mercury-containing devices were removed, although they could not give me exact amounts of mercury removed, as it was a combined clean out involving many school districts. It is probable that an estimated 78 pounds of mercury was removed.

Our workshop participant from the Brushton-Moira CSD reported that they will be initiating a mercury clean out at their schools scheduled for the 2007-2008 school year. They also reported that they will be requesting that any new science supplies include mercury-free devices.

Saratoga Springs

Participants for this mercury workshop came predominantly from highly populated Southern Saratoga County, with some school representatives from the more rural Warren and Washington counties. Follow up evaluation feedback indicated that the workshop and handouts were very informative, with strong interest shown on the New York State regulations and mercury spill exercise.

The follow mercury survey returned by our BOCES contact indicated that 26 pounds of mercury was removed from three schools in the Stillwater Central School district. The types of mercury removed came from lab thermometers, elemental and one barometer. Mercury-free alternatives were purchased to replace mercury-containing devices.

Norwich

Participants came from predominantly rural areas from Delaware, Chenango, Otsego, Madison counties. There are three small cities of note, Norwich, Oneonta and Oneida.. Even though it was a workshop in a sparsely populated region, it had one of the higher attendance rates. There was a lot of strong interest in this workshop expressed, with a lot of appreciation for the "hands on nature" of the training, especially the mercury spills clean up exercise. Follow up workshop phone conversation with the BOCES contact for this region indicated much of their extensive mercury inventorying and clean outs occurred prior to our mercury workshop. However, considering that hidden sources of mercury crop up from time to time, especially after the retirement of older science teachers, it was agreed that the knowledge and training that DEC offered was useful.

Ithaca

Largely rural, agrarian region with Ithaca being the sole noteworthy urban area. Although our workshop was very well received and its materials distributed to over 25 schools, the Tompkins-Seneca-Tioga BOCES had been very proactive on removing mercury from the schools in their district the year before. According to the followup mercury survey they filled out, they had removed mostly elemental and mercury devices from those schools. They did mention that the DEC mercury inventory form did help them locate sources of mercury in building component that they had been unaware of, prior to the mercury workshop. They also have replaced mercury devices with mercury-free alternatives.

An unexpected source of post-mercury workshop success story came not from a school representative, but from a county government representative, who reported in the follow up mercury survey that since he attended our workshop they have done the following:

- improved the mailback process for fluorescent bulbs for their county offices, jail and nursing home
- recycled at least 374 fluorescent bulbs over 2 months from county facilities
- added fluorescent bulbs to their spring home electronics collection drop-off event
- distributed a CFL recycling flyer to over 200 households
- informed their EMS and nursing offices that broken blood-pressure cuffs need to be recycled, not disposed of in the trash.

Elmira

Workshop participants came from predominantly rural counties, with the exception of the very urban area of Elmira, only city of note in those counties. Post workshop evaluations showed that the participants thought the training very informative and comprehensive. Followup mercury workshop surveys reported many of the informational materials were distributed to their respective schools. Much mercury removal efforts had been ongoing before our workshop, with the S-VE school district reported removing 23 pounds of elemental mercury. The Elmira city schools initiated a mercury clean out after a US EPA RCRA inspection in February 2006, by which they removed 12 pounds of elemental mercury and mercury-containing devices and 15 pounds of mercury compounds. They did replace their mercury-containing devices with mercury-free alternatives. Our workshop did spur a mercury clean out at the Addision Central School District, where 9 thermometers and 10 mercury thermostats were removed for a total of .25 pounds of mercury. They also replaced mercury-containing devices with mercury-free alternatives.

Lakeville

Participants from these workshops represent largely rural and small town school districts in the Finger Lakes region, with two cities of note, Canandaigua and Geneva in Ontario county. The mercury workshop was well received from comments taken from the post-workshop evaluation. A mercury clean out was initiated at the Pavilion Central School, where 32 pounds of mercury was removed (includes elemental and mercury-containing devices). A mercury clean outs were also initiated, post-workshop, at the Wheatland and Spencerport school districts, although we don't yet have the data on how much mercury was removed. All respondents from the post-mercury workshop survey reported distributing the informational materials taken back from the workshop to their respective school districts. Where mercury clean outs occurred, school districts replace their mercury-containing devices with mercury-free alternatives. The representative from the Alexander Central School District reported that they had just finished conducting a mercury clean out prior to our mercury workshop, but that they plan further clean outs to sweep out any further hidden sources of mercury. At that time, they plan to make use of the information that they received at our mercury workshop.

Binghamton

One of our smaller workshops, with most participants coming from the Broome-Tioga BOCES. This is probably as a result of a mercury spill that occurred at the BOCES just prior to our workshop.

The schools the participants represented are mostly small town and rural school districts in the Southern Tier of the state, the exception being the urban city area of Binghamton. A followup phone call with our BOCES contact revealed that our workshop had little impact, overall, on schools in that region.

Even though there were no mercury clean outs initiated as a result of our mercury workshop, the workshop itself was well received, with many good comments on the evaluations. The follow up surveys also reported that the informational materials were distributed at their respective school districts.

Conclusion:

The impacts that these ten mercury workshops had on New York State schools was very successful. These mercury workshops, as part of our expanded campaign to raise mercury awareness, account for 291 pounds of mercury removed from approximately 30 schools throughout the state. Even when mercury clean outs did not result from the workshops, most participants disseminated the mercury workshop information back to their school districts, heightening mercury awareness. When mercury clean outs did occur, in almost all cases it was reported that mercury-free alternatives were purchased to replace mercury-containing devices that were removed.

Overall, participants reacted very positively to our presentation, with strong preference for the New York State Universal Waste Rule and hazardous waste regulatory information. The mercury spill exercise was also rated quite highly. At almost all of the mercury workshops, a significant number of the participants admitted to having to deal with cleaning up a small mercury spill, usually a broken thermometer.

It is significant to note the value of the DEC Clean Sweep Program as a resource for schools to dispose of their mercury at a reasonable cost.

It was also quite useful to have DEC regional hazardous materials engineers on hand at each workshop location to contribute their knowledge of hazardous waste management options in their localities. Moreover, the workshop also served to heighten the DEC regional staff's mercury awareness on what is happening at their local schools districts, perhaps even leading to increased future compliance inspections.

The significant amount of mercury was eliminated from the many schools, from many counties throughout the state directly resulted or strongly influenced by our outreach efforts. As a result, these mercury workshops will have the benefit of protecting the health of school children, a population particularly sensitive to this potent neurotoxin, and diminish the potential for future mercury spills at schools and its inherent health risk associations.

Attachment A: Dates Mercury Workshops Held

2006

West Seneca - September 19

Olean - September 20

Watertown - October 25

Malone - October 26

Saratoga Springs - November 30

2007

Norwich - February 13

Ithaca - March 13

Elmira - March 14

Lakeville - May 3

Binghamton - May 16

Attachment B: List of Mercury Workshop Handouts

1) Mercury: Fact Sheet

2) How to Initiate a Mercury Clean out in Your School

3) Management of Mercury-Added Consumer Products in New York State

4) Highlights on the Amendment Chapter 676

5) Did You Know...Flurorescent Lamps Contain Mercury?

6) Useful Links for Mercury Information

7) Mercury and Schools: A Risky Combination - a series of brochures

8) Inventory: Facility-wide Inventory of Mercury and Mercury-Containing Devices

9) "Mean, Mad Mercury" poster

10) "Mercurio Loco Loco" poster

11) Article Reprint, "*Get the Mercury Out*", The Conservationist Magazine, February 2007 issue

Attachment C: Attendee List

Location of Workshops	Number of People	Types of People/Organizations Represented	Number of Schools/School Districts Represented	Counties Reached
West Seneca	19	**Health & Safety Coordinators** - Erie 1 BOCES - Erie 2 Chatauqua-Catteraugus BOCES - City of Buffalo Public School District **Buildings & Grounds** - Williamsville CSD - Depew SD - Cleveland Hill SD - Alden CSD - Hamburg CSD - City of Buffalo Public School District **Science Teachers** -- City of Buffalo Public School District **School Engineer**s - City of Buffalo Public School District **Environmental Education Specialist** - Erie County DEP **NYSDEC - Region 9, Buffalo** - Solid & Hazardous Materials Engineer	162	Erie Orleans Niagara
Olean	12	**Health & Safety Coordinators** - Cattaraugus-Allegany BOCES **Dean of Students** - Frensburg Central **Building & Grounds** - Pioneer SD - Cattaraugus-Allegany BOCES - Friendship SD - Genesee Valley SD - CLV SD **Science Teacher** - Andover CSD **NYSDEC- Region 9, Buffalo** - Solid & Hazardous Materials Engineer	38	Cattaraugus Allegany Chautuaqua

Location of Workshops	Number of People	Types of People/Organizations Represented	Number of Schools/School Districts Represented	Counties Reached
Watertown	19	**Health & Safety Coordinators** - Jefferson-Lewis BOCES - Watertown City Schools **Building & Grounds** - Parishville-Hopkinton CSD - Colton Pierpont CSD - Copenhagen CSD - Harrisville CSD - Lisbon CSD - Madrid-Waddington SD - Morristown SD - Hammond SD - Heuvelton SD - Potsdam CSD - Thousand Island CSD - Ogdensburg CSD - Sackets Harbor CSD **Science Teachers** - General Brown HS - Canton CSD **NYSDEC- Region 6, Watertown** - Solid & Hazardous Material Engineer - Regional Director	83	Jefferson Lewis
Malone	6	**Health & Safety Coordinators** - Franklin, Essex and Hamilton BOCES **Building & Grounds** - Chateaugay CSD - Brushton Moira SD **Science Teacher** - Tupper Lake CSD **Principal** - St. Regis Falls CSD **NYSDEC- Region 6, Watertown** - Solid & Hazardous Material Engineer	15	Franklin Essex Hamilton

Location of Workshops	Number of People	Types of People/Organizations Represented	Number of Schools/School Districts Represented	Counties Reached
Saratoga Springs	12	**Health & Safety Coordinators** - Washington-Saratoga-Warren-Hamilton-Essex BOCES - Capital Region BOCES **Building & Grounds** - Stillwater CSD - Windham Ashland Jewett CSD - Fort Ann SD - Waterford- Halfmoon SD - Glens Falls City Schools - Galway SD **NYSDEC- Region 5, Warrensburg** - Solid & Hazardous Material Engineer	59	Washington Saratoga Warren Hamilton Essex
Norwich	22	**Health & Safety Coordinators** - Delaware-Chenango-Madison-Otsego BOCES - Otsego-Northern Catskills BOCES **Building & Grounds** - Afton CSD - Bainbridge-Guilford CSD - Downsville CSD - Franklin CSD - Greene CSD - Hancock CSD - Oxford CSD - Unadilla Valley CSD - Unatego CSD - Walton CSD - **NYSDEC- Region 4, Schenectady** **NYSDEC - Region 7, Syracuse** - Solid & Hazardous Material Engineers	26	Delaware Chanango Madison Otsego
Ithaca	12	**Health & Safety Coordinators** - Tompkins-Seneca-Tioga BOCES - Cayuga-Onondaga BOCES **Science Teachers** - Newark Valley SD - IC SD **Environmental Engineer** - Cayuga County **Industrial Hygienist** - Cornell University **Building & Grounds** - Groton CSD - Moravia CSD - Newark Valley SD - Lansing SD **NYSDEC- Region 7, Syracuse** - Solid & Hazardous Material Engineer	42	Tompkins Seneca Tioga Cayuga Onondaga

Location of Workshops	Number of People	Types of People/Organizations Represented	Number of Schools/School Districts Represented	Counties Reached
Elmira	18	**Health & Safety Coordinators** - Greater Southern Tier BOCES **Science Teachers** - Horseheads SD - CG CSD **Building & Grounds** - Chenango Forks SD - Addison CSD - Spencer Van Et CSD - Waverly SD - Elmira City Schools - CPP SD - Elm Heights SD - Odessa Montour CSD **NYSDEC- Region 9, Buffalo** - Solid & Hazardous Material Engineer	11	Schulyer Chemung Tioga Steuben Allegany
Lakeville	17	**Health & Safety Coordinators** - Genesee Valley BOCES - Monroe 2 BOCES - Wayne Finger Lakes BOCES **Science Teacher** - Wayland-Cohocton CSD **Building & Grounds** - Caladonia-Mumford SD - Keshequa SD - Churchville-Litten SD - Alexander CDS - Spencerport SD - Letchworth CSD - Pavillion CSD - York SD - Batavia City Schools **Administrator for Human Resources** - Geneva City Schools **Chemical Hygiene Officer** - Marion CSD **NYSDEC- Region 8, Avon** - Solid & Hazardous Material Engineer	65	Genesee Wyoming Livingston Ontario
Binghamton	9	**Health & Safety Coordinators** - Broome BOCES - Delaware-Chenango-Madison-Otsego BOCES **Building & Grounds** - Binghamton City SD - Chenango Valley SD - Windsor SD **NYSDEC- Region 7, Syracuse** - Environmental Geologist	27	Broome Tioga