

basic steps for developing

A MERCURY MINIMIZATION PLAN

1 Identify your mission

- ✓ Develop a mission statement
- ✓ Identify scope of the program

2 Select a reduction team and form partnerships

- ✓ Assigned staff & volunteers
- ✓ Pick a facilitator
- ✓ Focus on partnerships

3 Develop baseline and set goals

- ✓ Mercury history profile
- ✓ Set a baseline year
- ✓ Establish program for assessing concentrations
- ✓ Set goals

4 Identify sources of mercury

- ✓ Potential sectors
- ✓ Identify sources
- ✓ Measure or estimate relative contributions

5 Evaluate tools and options

- ✓ Identify appropriate tools to reduce mercury
- ✓ Evaluate your options
- ✓ Make a list of highlighted sectors and identified tools

6 Set objectives and implement

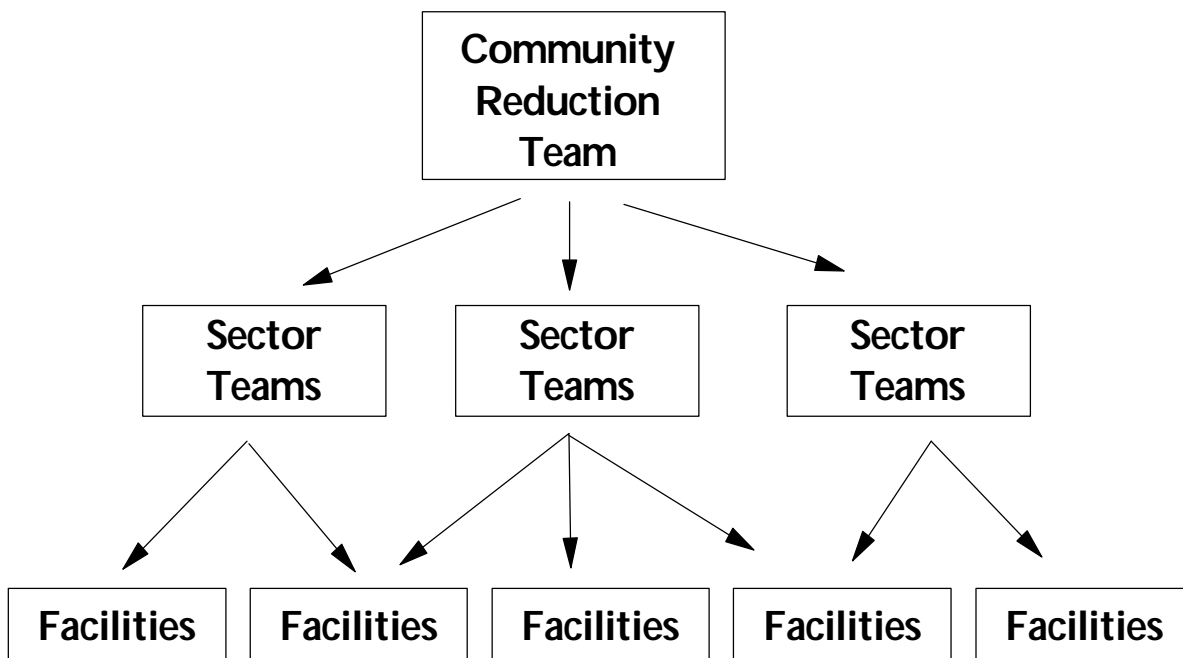
- ✓ Set specific objectives
- ✓ Develop performance measures
- ✓ Provide incentives
- ✓ Implement your reduction plan

7 Measure and promote your success

- ✓ Measuring success
- ✓ Develop a system to process results
- ✓ Enforce your policy
- ✓ Promote your success

The 7 step plan for writing a mercury reduction plan is general. The steps will be repeated as the program branches out from the community reduction team to sector and facility teams:

THREE LEVELS OF A MERCURY REDUCTION PROGRAM



The 7 step process is an outline that can be applied for a number of teams that will be working on your reduction plan. The steps provide a focus and general framework for establishing and evaluating your work. The use of the same general framework across teams will ensure consistency in approach, and will enable a more cohesive evaluation of success.

The Three Layers of a Community Mercury Minimization Plan

Community-Wide Mercury Reduction Team

- * Identifies overarching mission for the community plan
- * Selects reduction team members, forms partnerships
- * Establishes baseline and objectives for community plan
- * Identifies the sectors in the community that should consider reduction strategies (eg., dentists, hospitals, laboratories, metal finishers)
- * Reviews the tools and options identified by the sector teams
 - * Promotes the success of individual sectors
- * Calibrates the success of sectors to determine overall success of community program

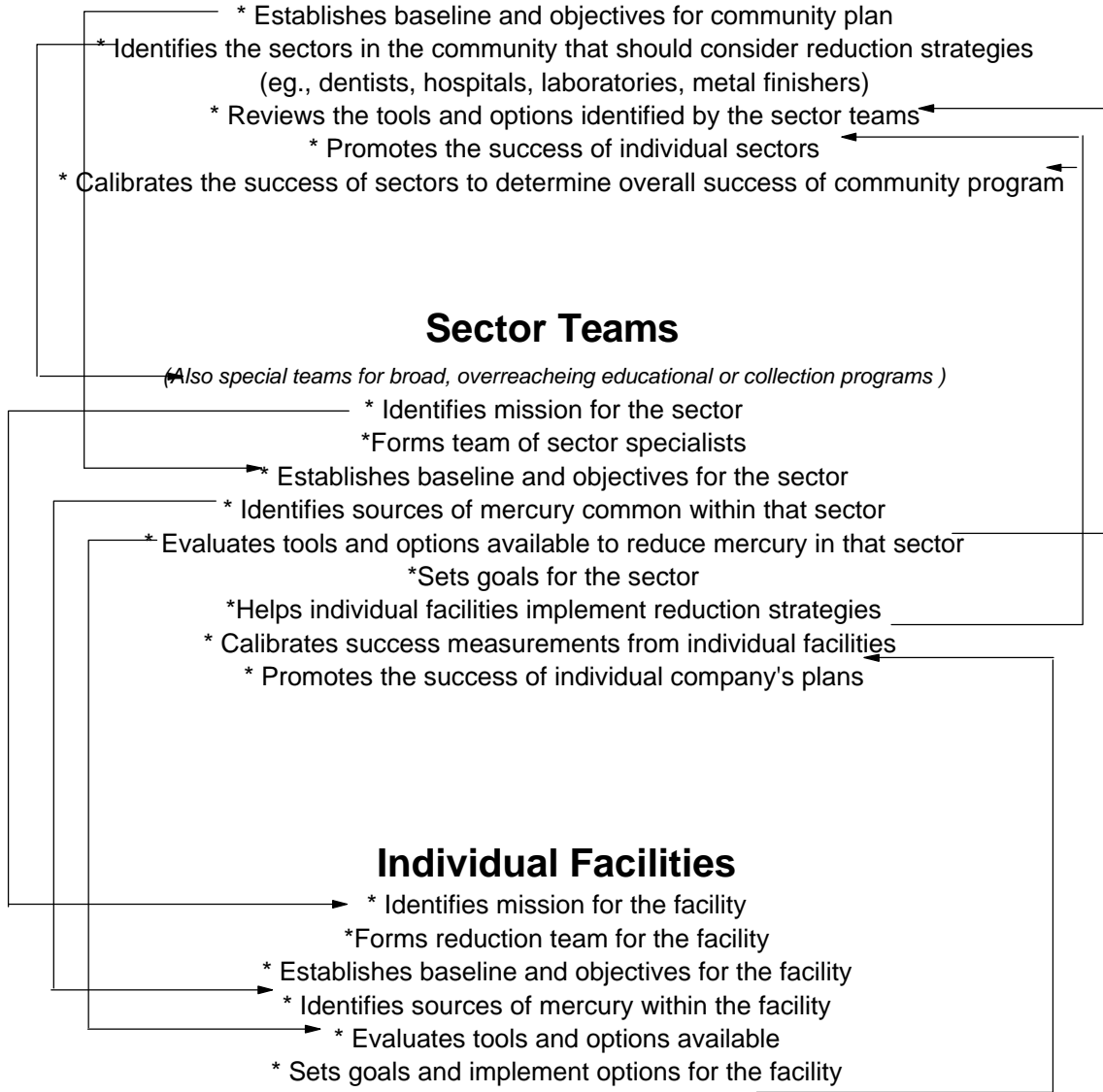
Sector Teams

(Also special teams for broad, overreaching educational or collection programs)

- * Identifies mission for the sector
- * Forms team of sector specialists
- * Establishes baseline and objectives for the sector
- * Identifies sources of mercury common within that sector
- * Evaluates tools and options available to reduce mercury in that sector
 - * Sets goals for the sector
- * Helps individual facilities implement reduction strategies
- * Calibrates success measurements from individual facilities
 - * Promotes the success of individual company's plans

Individual Facilities

- * Identifies mission for the facility
- * Forms reduction team for the facility
- * Establishes baseline and objectives for the facility
- * Identifies sources of mercury within the facility
- * Evaluates tools and options available
 - * Sets goals and implement options for the facility
 - * Measures and reports its success



1 IDENTIFY YOUR MISSION

- ✓ **Develop a mission statement**
- ✓ **Identify scope of the program**

BACKGROUND: **WHAT IS “POLLUTION PREVENTION”?**

Pollution prevention, or “source reduction,” is an activity that prevents waste at its source. It refers to practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources, or the protection of natural resources by conservation.

Pollution prevention is effective strategy in helping businesses increase their efficiency, meet or exceed environmental regulations, improve working conditions, eliminate paperwork, and reduce liability.

The EPA defines pollution prevention as any practice which

- ✓ reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise released into the environment prior to recycling, treatment, or disposal.
- ✓ reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

The term includes: equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

Under the pollution prevention act, recycling, energy recovery, treatment, and disposal are *not* included within the definition of pollution prevention.

Pollution prevention can be applied to all pollution-generating activities, including energy, agriculture, Federal, consumer, and industrial sectors.

Why Pollution Prevention for Mercury?

Reducing mercury at its source benefits individual companies and your community. Because of mercury’s global cycling patterns, mercury reduction also benefits the state, regional, and global environment.

As we have seen, reduced mercury emissions can result in healthier ecosystems, especially for top predators such as loons, eagles, otters, and mink. Mercury reduction can also help insure a healthy economy for Wisconsin, improving commercial and recreational fishing industries. Mercury reduction may also help to preserve the cultural values and customs of native americans living in this region, and populations who rely on subsistence fishing.

Source reduction makes sense with mercury for many reasons *(from Tim Tuominen):*

- ✓ There are prohibitive costs to add new treatment technology
- ✓ We cannot totally eliminate mercury emissions with technology
- ✓ Removal technology only relocates pollutant

Mercury pollution prevention...

- ★ reduces the need for subsequent management or regulation of any kind
- ★ protects health of citizens and wildlife
- ★ reduces costs and resources related to controlling, removing, and managing mercury contamination
- ★ protects fishing resources

From MI Merc Concern brochure

Pollution prevention includes a number of benefits for companies *(alaska)*:

- ✓ Savings from reduced need for pollution control equipment and monitoring
- ✓ Elimination of waste transportation, storage, and disposal costs
- ✓ A healthier workforce and community from reduced exposure to hazardous materials
- ✓ Reduced costs for compliance with disposal regulations
- ✓ Improved public image from taking positive steps towards your community's waste problems
- ✓ Reduced liabilities through the elimination of waste, both from lower insurance costs and possible future liabilities that may result from the improper disposal of waste

NY BRINGS CRIMINAL CHARGES FOR TOXIC CONTAMINATION OF WORKERS

The Pymm Thermometer Corporation of Brooklyn, NY: two of its executives and a plant foreman were indicted on charges of criminally assaulting and recklessly endangering the lives of their workers by “knowingly and continually” having them exposed to toxic mercury. It was the first time that criminal charges had been brought in NY against corporate executives for wrongful exposure of workers to toxic chemicals. The indictment says that one of the 80 employees of the plant suffered permanent brain damage from mercury poisoning and the defendants were charged with assaulting the man with mercury as the weapon. According to the state attorney general, an undetermined number of other employees were endangered by the mercury, a chemical that has been linked to kidney damage and loss of vision. The Pymm defendants established a covert mercury-recovery operation in Apr. 1983 in the cellar of the plant and managed to hide it from federal inspectors until Oct. 1985.

The injured employee worked in the cellar for 11 months, where he received the exposure that led to his injuries. The defendants, also accused of conspiracy and falsifying business records, pleaded not guilty.

—Peter Montague, Ph.D.

From RACHEL'S HAZARDOUS WASTE NEWS #4, December 22, 1986, Environmental Research Foundation, Internet: erf@igc.apc.org

From Source Reduction Now:

YOUR FIRST STEP

The first step in developing your community’s Pollution Minimization Plan (PMP) is for the senior management of your wastewater treatment plant to declare support of your mercury minimization project. This gives credence to the endeavor, highlights its significance, and fosters a supportive environment for staff.

Establishing a strong foundation for your project is crucial. This can be accomplished by several methods:

* Mission Statements

When produced in cooperation with staff, mission statements can provide direction to your project, and clearly define a new policy or approach. Involving staff early in this process helps build teamwork.

Mission statements are usually best when concise and direct. They could be as simple as:

We make an attempt to reduce mercury emissions entering our wastewater treatment plant. We will do this through voluntary cooperation with the community, establishing partnerships with interested citizen groups, industries, and associations.

We will accomplish mercury reduction in our community by asking the following questions:

- ◆ Where are the potential sources of mercury use in our community?
- ◆ Are there alternatives to mercury use in these settings?

Pollution prevention opportunities are our primary focus, but we also agree to help establish collection systems for mercury-containing products no longer used or needed.

We further agree to promote our results to others to encourage mercury reduction throughout the state and beyond.

The first section of the mission statement provides direction to the project; the following statements provide supportive guidance. The last section, about promoting results to others, provides additional significance and importance to the project. People are willing to work harder when they know their ideas will be promoted elsewhere.

* Identifying the Scope of Your Project

To be effective, the parameters of your project need to be made clear. Will you include regulated and non-regulated industries or commercial establishments in your plan? What about mercury that may enter your plant from processing landfill leachate? What about mercury sitting on shelves, disposed in solid wastes, or released in air emissions?

In addition, project statements issued from top management need to include several components that define a project:

- ★ What the management wants to do to prevent mercury pollution (a broad or overreaching goal)
- ★ Who will implement the project or plan
- ★ Why the plan is being written

Defining this information early in the project will help give your efforts focus and will allow for more support from your community as you establish partnerships.

BIBLIOGRAPHY

This document was designed to be a compilation of the best mercury information available to date. We are gratefully indebted to the work of authors below, without whose innovative and ground-breaking research this report would not be possible. Please note that many of these sources were quoted directly:

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Merc Concern: Mercury Awareness for Michigan Citizens, Michigan Department of Environmental Quality

Notes from Pollution Prevention Conference, Tim Tuominen, Western Lake Superior Sanitary District, Superior, Wisconsin, October 9, 1995

NY Brings Criminal Charges for Toxic Contamination of Workers, Peter Montague, *Rachel's Hazardous Waste News* #4, December 22, 1986

Profiting from Waste Reduction in Your Small Business, David Wigglesworth, Alaska Health Project, 1988

Waste Prevention: Source Reduction Now, Kenneth Brown, Minnesota Office of Waste Management, February 1993

Zero Discharge Pilot Project Work Plan, Western Lake Superior Sanitary District, January, 1995

2 SELECT A REDUCTION TEAM & FORM PARTNERSHIPS

- ✓ Assigned staff
- ✓ Volunteers + alternates
- ✓ Pick a facilitator
- ✓ How partnerships can work for you
- ✓ List of current partnerships in Wisconsin
- ✓ Potential partners

From Source Reduction Now:

Once senior management has established a mission statement and defined the scope of the project, you are ready to determine who will work on the project.

* Pick a Facilitator

Once your team of assigned and volunteer staff is established, you need to pick a facilitator. This individual should have strong organizational skills and should be committed to team building. The facilitator will act as the designated link to other organizations and agencies. If the team is carrying out an information search, it is helpful to have this individual be the sole recipient of information. This minimizes the risk of duplication.

It is also critical that this individual understands the difference between pollution prevention, recycling, and pollution control techniques. The facilitator should keep the focus on pollution prevention, but may need to promote the recycling of mercury, especially at the beginning of the program. The facilitator also needs to keep the group within the established scope of the project and other parameters defined by the mission statement.

The facilitator should route the agendas of each meeting to members of the team, and should identify team members who have volunteered for specific tasks. Tracking job assignments and accomplishments helps increase efficiency and establish progress toward goals. Sending a copy of meeting agendas and minutes to senior management helps keep them informed. Writing the minutes, meeting agendas, and job assignments are the major tasks of the facilitator. This individual should probably not undertake research projects in addition to these duties.

* Assigned staff

* Volunteers & alternates

It is usually a good idea to have staff assigned to the project, and to also ask for volunteers. Volunteers who have a personal interest in the project work out well because they usually have enthusiasm for the project.

In each case, it is important for senior management to give authorization for the employees to attend meetings and research the feasibility of ideas. If staff is unclear about authorization of the project, it will likely be a low priority. Written authorization for the project is effective and clear.

Facilitator

- ✓ link to other organizations and agencies
- ✓ recipient of information
- ✓ maintains established scope and mission of the project
- ✓ writes agendas, minutes and task assignments
- ✓ tracks progress toward goals

ESTABLISHING PARTNERSHIPS

* How partnerships can work for you

Designing and implementing a mercury reduction plan for your community is a big task! We recommend that you do not attempt to do it alone. You will have the best success if you establish partnerships with a variety of organizations that may include environmental groups, trade associations, and individual companies.

The following qualities have been identified by the Management Institute for Environment and Business as key elements of success in partnerships:

- ◆ *Shared vision and individual leadership is crucial*
A partnership should involve senior-level people or a chosen representative
- ◆ *Participants must identify common interests and avoid issues where mutual interests do not exist and no compromise can be found*
People learn from each other's perspective of a problem. Time to work through issues to a position of mutual respect and trust is essential
- ◆ *Stakeholders have something tangible to gain from partnership*
Partnerships offer a variety of benefits including enhanced credibility, additional knowledge, and more effective solutions to problems
- ◆ *Key stakeholders must be involved as equal parties in the partnership*
Since other public policy issues are often characterized by power politics, this "equality" aspect of partnerships is particularly important

"Voluntary partnerships can combine the financial and technical resources of the private sector, the environmental expertise and credibility of non-governmental organizations and the authority of government to address environmental issues directly and actively."

From MEB "Natural Resource Partnerships" (journal unknown)

Why partnering?

- ★ mutual benefits - public accountability, DNR protection, quality of life
- ★ efficient - end to spending, fighting, suing
- ★ refreshingly different - positive, professional relationship

Lessons learned:

- ★ both groups need to frequently express commitment
- ★ define the motivation: both get something out of it: better image; improved efficiency
- ★ communication - keep frequent and open
- ★ potential pitfalls: lack of trust, diminishing returns, too much on table at a time, regulations

- Ken Wiesner

"Building partnerships with citizens, local governments, and private sectors interests is the preferred approach for addressing many of our high priority environmental problems."

- USEPA region V state's priorities april 22 memo/draft

WHAT WILL THE PARTNERS DO?

Partnerships will offer technology transfer efforts that will promote pollution prevention both within the appropriate industry and with their chemical and equipment suppliers. Partners may research mercury use and different alternatives to that use at their facility.

The initial focus with your partners may center around educational efforts. In this case, a partnering industry may act as a guide or “model” for similar business. You may cooperatively plan workshops that target a particular sector, and then follow up with technical assistance on a site-specific basis. You may discover that you need to form a task force for a particular

sector in your community that will identify the scope of the mercury problem, research pollution prevention methods, and financial incentives/disincentives for that sector.

Established partners should provide you with annual data and progress reports. These should include management plans, goals, timetables, an assessment of pollution prevention options, and historical progress to date. Each participant should be committed to continuous improvement, both in terms of business bottom line and environmental protection.

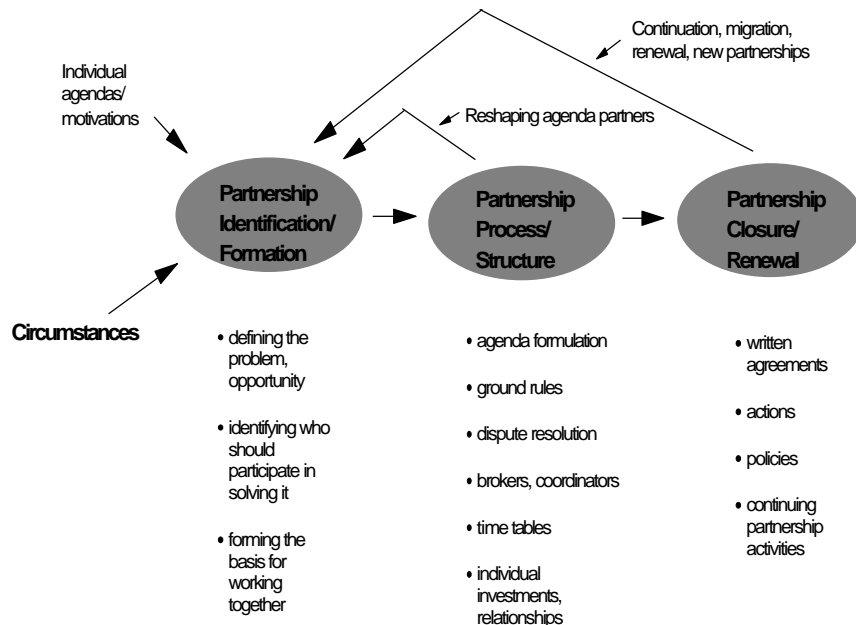
Partnership Goals

- ◆ Strengthen the working relationship between the private and public sectors
- ◆ Improve capabilities for anticipating and avoiding environmental problems
- ◆ Pool resources and focus attention on the mutual goal of pollution prevention
- ◆ Exchange information and expertise, and help transfer these to medium and small companies and the general public

Colorado’s partnership experience demonstrated that incentives for pollution prevention were basically “intrinsic motivations” that had nothing to do with tangible rewards or outcomes; the motivation was largely moral or ethical. However, companies wanted to be assured that pollution prevention would pay for itself, have a demonstrable effect on the environment, or improve employee health.

by Paul Ferraro, Colorado Pollution Prevention Partnership, as presented in EPA Journal, fall 94, Vol 20, #3-4

The Partnership Life Cycle



Source: Management Institute for Environment and Business

CURRENT PARTNERSHIPS, RESOURCES, AND PROGRAMS IN WISCONSIN

Some of our mercury reduction work may be able to be integrated into partnerships or efforts that are already established by the Wisconsin Department of Natural Resources. Below is a listing of current pollution prevention efforts that may be utilized for mercury reduction work.

INFORMATION

Industrial Waste Reduction Clearinghouse

This clearinghouse contains over 150 publications which detail waste reduction processes and improved waste management choices. Documents are added throughout the year that are both process specific and applicable to a variety of businesses. Access to this clearinghouse should be available through the World-wide Web in the future.

Internet Resources

The DNR's home page was officially turned on in February, 1996. On it can be found the latest waste reduction case studies, fact sheets, available publications, and more. The address is <www.dnr.state.wi.us>. Some areas still may be 'under construction', but additional information is expected to be added throughout the coming years.

Managing Your Hazardous Waste: A Guide for Wisconsin Small Quantity Generators

This recently updated, easy-to-understand booklet provides

information on hazardous waste regulations, provides resources to help with the regulatory process and gives waste prevention tips.

Sector Specialists

Specialists will develop expertise in business and environmental issues facing individual business sectors in order to help those businesses navigate through the Department of Natural Resources. They will also be on hand to provide training in regulatory issues and offer assistance with technology transfer opportunities.

TRI (Toxic Release Inventory) & ITRS (Integrated Toxic Reporting Systems) Resources:

TRI data is gathered by the department and is generally available. The Integrated Toxic Reporting System allows for multi-media data to be generated for any facility in the state for use by the facility, consultants, the public or by DNR inspectors. Wastes generated can be tracked whether released to the air or water, or disposed of as solid or hazardous waste. Both the TRI database and the ITRS database are living databases, with information continuously added to them.

Waste·Less·News

This quarterly newsletter highlights environmental regulatory updates, waste reduction initiatives, publications, and workshops. Recent editions have concentrated on Mercury as an issue of concern in the state, small business assistance, and alternative approaches to environmental protection.

Wisconsin Recycling Markets Directory

A comprehensive listing of more than 400 organizations that buy or accept recyclable materials. Currently available on paper or computer disk, it is updated every 18 months. In the future, it is to be made available on the DNR's homepage.

GRANTS & ASSISTANCE PROGRAMS

Case Studies

A collection of over 50 case studies of businesses documenting pollution prevention at work. These successful waste reduction efforts promote business-to-business technology transfer, and document not only emissions reductions but also economic savings. Additional case studies are being generated. For more information, please contact Recognition Coordinator in the WDNR Cooperative Environmental Bureau at (608) 267-9700.

Full Cost Accounting (FCA) / Waste Cost Accounting (WCA)

FCA is about better assessing all production costs. FCA allows a business to identify the full costs associated with various processes and materials that are normally "hidden" in overhead costs. WCA is concerned with assigning dollar amounts to costs associated with a business' hazardous chemical waste stream(s). Brochures and informational materials have been prepared to help business understand the benefits of developing a better understanding of their internal accounting systems, and will be updated and supplemented with case study information as accounting case studies are completed.

ISO 14000

An international standard dealing with the development of an environmental management system is an event that the DNR is closely tracking. An advisory group has been created which will advise the DNR in how to respond to companies that attain ISO 14000 certification. A pilot project with companies that are interested in developing an environmental management system is envisioned in the future.

Solid & Hazardous Waste Education Center (SHWEC)

The University of Wisconsin-Extension's SHWEC provides education and technical assistance on waste reduction opportunities to businesses through workshops and on-site visits. In addition, they are active partners in the Great Printers Project, and are involved in the promotion of pollution prevention in the state.

Waste Reduction & Recycling Demonstration Grants

This grant program is available to businesses and others in the private sector to provide funding for innovative and transferable technology. Previously, this program was mostly geared toward recycling projects, but a new focus provides greater emphasis on waste reduction projects.

PARTNERSHIPS

The Great Printers Project (GPP)

The GPP is committed to the "Great Printers" principles. Great Printers not only pledge to reduce wastes and increase consumer awareness, but also provide input into the creation of streamlined reporting and other regulatory developments. Great Printers partners are: Printing Industry of Wisconsin, Citizens for a Better Environment, Department of Natural Resources, and University of Wisconsin - Extension's Solid and Hazardous Waste Education Center. Future activities include the development of a consolidated reporting option for printers, the development of annual reports of progress, and the creation of a technical video conferences.

Pulp & Paper Pollution Prevention Partnership

This partnership is intended to supplement environmental compliance efforts of partners by creating environmental improvement opportunities that are cost effective. The partnership's two annual reports to date demonstrate significant progress in toxics reduction and cost savings. Future activities include focusing attention on additional emissions that are not regulated, and working with the DNR on developing an acceptable approach for these compounds. Please see the case study below for more information.

Southeast Wisconsin Waste Reduction Coalition

The mission of the coalition is to reduce the amount of waste generated by residents and businesses throughout southeast Wisconsin through a regionally coordinated waste reduction campaign. Businesses, environmental groups, community groups, and local government are involved, and future efforts include targeted work with businesses to educate consumers on purchasing decisions.

WasteCap Wisconsin

This public-private partnership acts as a business-to-business peer exchange for waste reduction and recycling issues. WasteCap offers businesses such services as site visits and industry-specific fact sheets. Future efforts include developing on-line resources that will provide businesses with up to date information with waste reduction opportunities, and will create a network of individuals with expertise in waste reduction, recycling and other environmental issues.

Wisconsin's Waste Reduction Coalition

The coalition offers another unique opportunity for the private and public sectors to work together to raise awareness about waste reduction opportunities and to change behaviors. It develops approaches and delivers consistent waste reduction messages by focusing on purchasing decisions and how those decisions effect the amount of waste produced. Partners include: Associated

Recyclers of Wisconsin, Citizens for a Better Environment, City of West Allis, Fleming Companies, Keep Greater Milwaukee Beautiful, Wisconsin Grocers Association, Wisconsin Merchants Federation, University of Wisconsin - Extension, Department of Agriculture Trade and Consumer Protection, and Department of Natural Resource.

PROGRAMS

Clean Sweep

Sponsored at the local level, clean sweeps are designed to save money, reduce liability, and keep hazardous wastes out of community waste streams. Clean Sweep days allow households and many small businesses to dispose of hazardous waste without meeting state disposal regulations.

Climate Wise / The Governor's Industry Partnership Program

Climate Wise allows individual companies to work with the DNR, the Department of Administration's Energy Bureau, or the Energy Center of Wisconsin on the establishment of goals for energy and emissions reductions. It also allows companies to choose for themselves how to meet these goals. Participants agree to initiate, expand, and/or accelerate cost-effective measures to improve efficiency and protect the environment through the reduction of greenhouse gases.

Community Mentoring

Under the joint sponsorship of the DNR and Minnesota's Pollution Control Agency, the Western Lake Superior Sanitary District is working with many Lake Superior communities to build waste reduction capabilities in wastewater treatment plant operations. This project has provided many benefits to date, including reductions in loadings, and better relationships between all of the parties. Future participation is dependent on additional sources of funds.

Efficiency 2000

This voluntary pledge program is based on EPA's 33/50 program. It is designed for businesses interested in decreasing their emissions and thereby moving down, or off, of the TRI list of major emitters in the state. A business can choose a variety of methods to reduce its TRI reported wastes based on self-reported goals. Future activities include yearly recognition for successful companies, technical assistance and access to financial assistance.

Partners for Clean Air

Reducing volatile organic (VOC) emissions and promoting clean air in the southeastern part of the state is the focus for this voluntary pledge program. This program is slated to be up and running by Summer 1996. It is intended meet the goals of Wisconsin's State Implementation Plan by preempting the need for additional regulatory requirements.

Energy Use Work Group

A statewide workgroup composed of utilities, regulators, and industry will recommend alternatives that reduce mercury emissions in the Lake Superior basin. The group has divided into subgroups which will develop plans to address various sources of mercury.

Lake Superior Binational Program

U.S. and Canadian governments (including the DNR) are jointly developing a lakewide management plan focusing on waste reduction. Pollution prevention has been identified as the preferred method for achieving reductions in nine chemicals of concern. Ultimately the plan will provide an integrated management plan for the entire lake ecosystem.

Medical Waste Reduction Planning

Ongoing effort to work with hospitals, clinics, and nursing homes to develop and implement an infectious waste reduction plan. The effort is to be expanded to include toxins and hazardous wastes generated by medical facilities, including dentists.

Small Quantity Generator / Industry Specific Workshops

The DNR offers a number of regulatory and waste reduction workshops throughout the state. These efforts to reach many small businesses that are unaware of their regulatory responsibilities have been very successful and beneficial both from a department and business perspective.

Case study: Pulp & Paper Partnership

(from the 1996 annual report)

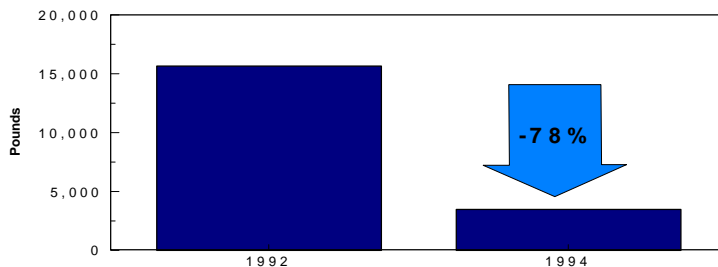
The Pollution Prevention Partnership (P3) is a voluntary initiative undertaken by Wisconsin's paper industry in cooperation with the state's Department of Natural Resources. Its purpose is to reduce the industry's release of pollutants which could adversely impact the environment. This innovative program includes air emissions, wastewater discharges, solid and hazardous wastes. P3 was formally introduced in 1993 and involves 27 paper companies and 43 facilities. The program is coordinated by the industry's trade association, the Wisconsin Paper Council.

During the past two years, the paper industry's combined air emissions and wastewater discharges dropped 4.6 percent from 288,040,947 pounds in 1992 to 274,770,228 pounds in 1994. When normalized with production increases during the same timeframe, the reduction in environmental releases becomes even more impressive at 14 percent.

Since 1987, the first year data was compiled under P3, there has been a production normalized reduction of 30.3 percent in the release of substances identified in the project. On a production normalized basis, BOD/TSS discharges dropped 5.5 percent from 4.01 pounds per ton of production in 1992 to 3.79 pounds per ton of production in 1994. Since 1987, when combined BOD/TSS discharges stood at 5.45 pounds per ton of production, the industry's releases have dropped 30 percent.

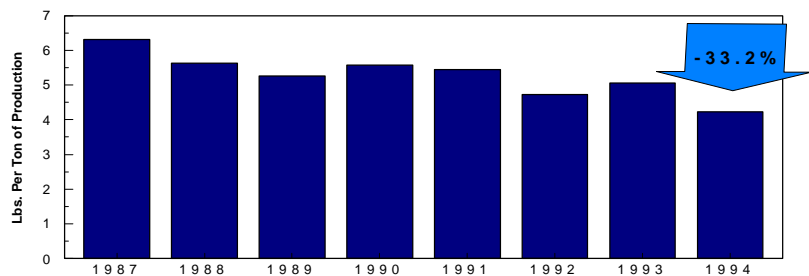
The discharge of bioaccumulative substances have dropped dramatically by 78 percent from 15,658 pounds in 1992 to 3,494 pounds in 1994.

Discharge of Bioaccumulative Substances
Pollution Prevention Partnership



Overall, the paper industry's wastewater discharges have dropped 33 percent from 6.32 pounds per ton of production in 1987 to 4.22 pounds in 1994.

Wastewater Discharges
Pollution Prevention Partnership



POTENTIAL TRADE ASSOCIATIONS

The list that begins on the following page details the names of trade associations that may want to get involved in mercury reduction efforts on a local or statewide scale.

The trade associations have been sorted into sector categories as they appear in chapter four of the Mercury Sourcebook. More information is available for these organizations, including addresses, current officers, meeting times and publication information. Please contact the Wastewater Mercury Specialist at (608) 267-7694.

BIBLIOGRAPHY

This document was designed to be a compilation of the best mercury information available to date. We are gratefully indebted to the work of authors below, without whose innovative and ground-breaking research this report would not be possible. Please note that many of these sources were quoted directly:

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Second Annual Progress Report, Pollution Prevention Partnership (P3), January 1996

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Potential Trade Association

Agriculture

Wisconsin Association of Vocational Agriculture Instructors	ID# 5
Wisconsin Federation of Cooperatives	ID# 13
National Agri-Business Association	ID# 105
Wisconsin Association of Future Farmers of America	ID# 134
Wisconsin National Farmers Organization	ID# 209
Wisconsin Organic Growers Association	ID# 213
Wisconsin Potato & Vegetable Growers Association, Inc.	ID# 217
Wisconsin Agri-Business Council, Inc.	ID# 267
Post-Secondary Agriculture Students	ID# 284
Wisconsin Agriculture Association	ID# 291
Wisconsin Farm Bureau Federation Coop	ID# 314
Wisconsin Agri-Service Association, Inc.	ID# 316
Wisconsin Women for Agriculture	ID# 349

Automotive

American Auto Association of Wisconsin	ID# 26
Automobile Dealers Association of Mega Milwaukee	ID# 27
Concerned Auto Recyclers of Wisconsin	ID# 29
Wisconsin Auto & Truck Dealers Associations	ID# 36
Wisconsin Automotive Parts Association	ID# 37
Wisconsin Auto Collision Technicians Association	ID# 40
Society of Automotive Historians, Wisconsin Chapter	ID# 118
Wisconsin All Terrain Vehicle Association	ID# 122
Wisconsin Automatic Merchandising Council	ID# 139
Wisconsin Institute of Scrap Recycling Industries	ID# 187
Automotive Service Association of Wisconsin	ID# 273
Wisconsin Auto Merchandising Council	ID# 297
Wisconsin Automotive Clubs Association	ID# 298
American Automobile Manufacturer Association	ID# 354

Potential Trade Association

Automotive

Steel Recycling Institute	ID# 379
Wisconsin Motor Carriers Association	ID# 389
Wisconsin Automotive Trades Association	ID# 398
Steel Recycling Institute, Central Northern Region	ID# 444
Steel Recycling Institute, National Headquarters	ID# 445
Service Station Dealers of America & Allied Trades	ID# 455
Wisconsin Institute of Scrap Recycling Industries	ID# 459
Western Wisconsin Recycling Association	ID# 505

Chemical Manufacturers

Chemical Coaters Association	ID# 28
Wisconsin Fertilizer & Chemical Association	ID# 317
Chemical Safety Association	ID# 466
Chemical Coaters Association International	ID# 475
Chemical Manufacturers Association	ID# 484

Commercial

Wisconsin AFL-CIO	ID# 10
Bay View Business Association	ID# 75
Building Owners & Managers Association of Milwaukee	ID# 76
Conference of Retail Associations	ID# 80
Wisconsin Business Education Association	ID# 299
Wisconsin Business Womens Coalition	ID# 300
Wisconsin Independent Businesses	ID# 322
United States Small Business Administration	ID# 363
Independent Business Association of Wisconsin	ID# 394
National Federation of Independent Business, WI Chapter	ID# 418
National Federation of Independent Businesses	ID# 446
Wisconsin Merchants Federation	ID# 460
Governor's Conference on Small Business	ID# 468

Potential Trade Association

Contractors/Construction	
Wisconsin Builders Association	ID# 42
Institute of Real Estate Management	ID# 91
Wisconsin National Electrical Contractors	ID# 108
Wisconsin Association of Plumbing-Heating-Cooling Contractors, Inc.	ID# 111
Wisconsin Chapter Associated General Contractors	ID# 177
Wisconsin Manufactured Housing Association	ID# 197
Wisconsin Master Builders Association	ID# 199
Wisconsin Modular Housing Industry	ID# 206
Wisconsin Retail Hardware Association	ID# 225
Allied Construction Employers Association	ID# 268
American Institute of Architects, Wisconsin Society	ID# 270
Construction Industry Manufacturers Association	ID# 275
Associated General Contractors of Greater Milwaukee	ID# 277
Mechanical Contractors Association of Wisconsin	ID# 281
State Engineering Association	ID# 288
Wisconsin Independent Businesses	ID# 322
Wisconsin Society of Mechanical Engineers	ID# 337
Wisconsin State Council of Carpenters	ID# 339
Midwest Hardware Association	ID# 368
Wisconsin Professional Engineers Association	ID# 378
National Association of Home builders	ID# 420
Door County Home Builders Association	ID# 422
Golden Sands Home Builders Association	ID# 423
Madison Area Builders Association	ID# 424
Metropolitan Builders Association	ID# 425
St. Croix Valley Home Builders Association	ID# 426
Valley Home builders Association	ID# 427
Headwaters Home Builders Association	ID# 428
Brown county Home Builders Association	ID# 429

Potential Trade Association

Contractors/Construction

Chippewa Valley Home Builders Association	ID# 430
La Crosse Area Builders Association	ID# 431
Man-Cal Builders Association	ID# 432
Northland Area Builders Association	ID# 433
Sheboygan County Home Builders Association	ID# 434
Wausau Area Builders Association	ID# 435
Central Wisconsin Home Builders Association	ID# 436
Fond Du Lac County Home Builders Association	ID# 437
Lakeland Builders Association	ID# 438
Mid-Wisconsin Home Builders Association	ID# 439
Racine-Kenosha Builders Association	ID# 440
South Central Wisconsin Builders Association	ID# 441
Winnebago County Home Builders Association	ID# 442
Midwest Hardware Association	ID# 482
National Retail Hardware Association	ID# 483

Dairy Farm

Dairy Council of Wisconsin, Inc.	ID# 166
Wisconsin Farm Equipment Association	ID# 172
Farm Health & Safety Council of Wisconsin	ID# 276
Wisconsin Dairy Technology Society	ID# 311
Associated Milk Producers, Inc.	ID# 327
Wisconsin Milk Producers Association	ID# 392

Dentists

Wisconsin Dental Association, Inc.	ID# 44
Wisconsin Dental Laboratory Association	ID# 312

Educational Institutions

Wisconsin Health Education Center	ID# 1
Wisconsin Association for Environmental Education	ID# 2

Potential Trade Association

Electrical Manufacturers

Wisconsin Association for Middle Level Education	ID# 8
Wisconsin Foundation for Independent Colleges	ID# 318
Wisconsin Association of Independent Colleges & Universities	ID# 319
Midwest Equipment Dealers Association	ID# 101
Wisconsin Electronic Sales and Services Association	ID# 170
Wisconsin Electric Cooperative Association	ID# 313

Food Service/Processors

Wisconsin Meat Processors Association	ID# 200
Wisconsin Association of Milk & Food Sanitarians	ID# 203
Wisconsin Natural Food Associates, Inc.	ID# 210
Wisconsin Restaurant Association	ID# 224
Wisconsin State Brewers Association	ID# 237
Wisconsin-Minnesota Canned Vegetable Council	ID# 261
Midwest Food Processors Association	ID# 282

General Education

Wisconsin Community Education Association	ID# 6
Wisconsin Public Health Association, Inc.	ID# 17
Hispanic Chamber of Commerce	ID# 22
Urban League	ID# 23
Milwaukee Indian Health Board, Community Health Centers	ID# 25
Wisconsin Environmental Health Association	ID# 48
Alliance for Animals	ID# 71
Animal Protective League, Inc.	ID# 73
Citizens for a Better Environment	ID# 78
Environment Wisconsin, Inc.	ID# 83
Lake Michigan Federation	ID# 94
Wisconsin League of Women Voters, Inc.	ID# 96
Protect Animal Life, Inc.	ID# 112
Wisconsin Association of Lakes, Inc.	ID# 138

Potential Trade Association

General Education

American Fisheries Society, Wisconsin Chapter	ID# 149
Nature Conservancy, Wisconsin Chapter	ID# 150
Wildlife Society, Wisconsin Chapter	ID# 151
Wisconsin Land Conservation Association	ID# 191
Wisconsin Tourism Federation	ID# 247
Wisconsin Water Quality Association	ID# 254
Wisconsin Wildlife Federation, Inc.	ID# 256
Wilderness Watch, Inc.	ID# 264
Clean Water Action Council of Northeast Wisconsin	ID# 358
Wisconsin County Solid Waste managers Association	ID# 369
Municipal Environmental Association of Wisconsin	ID# 370
Municipal Environmental Group	ID# 376
Central States Water Environmental Association, WI Section	ID# 412
Greater Milwaukee Toxics Minimization Task Force	ID# 417
National Association of Environmental Professionals	ID# 450
Air & Waste Management Association	ID# 451
National Environmental Training Association	ID# 452
National Solid Wastes Management Association	ID# 453
Sierra Club	ID# 464
Wisconsin Environmental Decade, Inc.	ID# 467
Keep Greater Milwaukee Beautiful, Inc.	ID# 470
Wisconsin County Solid Waste Managers Association	ID# 506
Great Lakes Inter-Tribal Council	ID# 507

Hospital/Clinics

Wisconsin Health Information Management Association	ID# 14
Wisconsin Hospital Association	ID# 50
United Professional Quality Health Care	ID# 121
Wisconsin HMO Association	ID# 180
Wisconsin Medical Group Management Association	ID# 201

Potential Trade Association

Hospital/Clinics	
Wisconsin Health Care Association	ID# 212
Wisconsin Pharmacists Association	ID# 216
Wisconsin Primary Health Care Association	ID# 218
State Medical Society of Wisconsin	ID# 289
Household	
Wisconsin City Management Association	ID# 304
Wisconsin Alliance of Cities, Inc.	ID# 375
Industry/Manufacturing	
Wisconsin Cast Metals Association	ID# 43
Wisconsin Association of Manufacturers Agents	ID# 133
Industry Relations Research Association	ID# 278
Wisconsin Industrial Recyclers	ID# 279
Wisconsin Independent Merchants & Manufacturing Association	ID# 320
Wisconsin Technology Education Association	ID# 343
American Electroplaters & Surface Finishers	ID# 397
Wisconsin Protective Coatings Association	ID# 443
National Association of Metal Finishers	ID# 449
Laboratories	
Wisconsin Environmental Laboratory Association	ID# 45
Miscellaneous	
Wisconsin Hazardous Material Responders	ID# 46
Wisconsin Utilities Association	ID# 61
Wisconsin Municipal Electric Utilities	ID# 102
Soap & Detergent Association	ID# 116
Wisconsin Conference of Journeymen Painters	ID# 308
Wisconsin Counties Mineral Resources Association	ID# 309
Wisconsin Painting & Decorating Contractors	ID# 330
Wisconsin Association of Textile Services	ID# 344

Potential Trade Association

Miscellaneous	
Wisconsin Road Builders Association	ID# 351
Manufacturers of Emission Controls Association	ID# 361
National Paint & Coatings Association	ID# 362
Wisconsin Association of Incinerator Operators	ID# 364
Wisconsin Towns Association	ID# 371
Federation of Environmental Technologists	ID# 372
Wisconsin Paint & Coatings Association	ID# 405
Society for the Plastics Industry	ID# 469
Marathon County Hazardous Waste Cooperative	ID# 471
Society for the Plastics Industry, Midwest Section	ID# 477
American Plastics Council	ID# 478
Nursing Homes	
Coalition of Wisconsin Aging Groups	ID# 79
Wisconsin Association of Homes & Services for the Aging	ID# 131
Wisconsin Nursing Home Association	ID# 395
POTW	
Joint Organization for Better Sewers	ID# 93
Wisconsin American Public Works Association	ID# 294
Wisconsin Wastewater Operators Association	ID# 414
Paper Mills/Printing	
Gravure Association of America	ID# 3
Printing Industries of Wisconsin	ID# 38
Wisconsin Paper Council	ID# 51
Technical Association of the Pulp & Paper Industry	ID# 447
Printing Industries of America	ID# 454
Veterinary Clinics	
Wisconsin Veterinarian Medical Association	ID# 252

3 DEVELOP A BASELINE AND SET GOALS

- ✓ Mercury history profile
- ✓ Set a baseline year
- ✓ Establish program for assessing concentrations
- ✓ Setting your goals

Before you begin evaluating or implementing mercury reduction strategies in your community, it is crucial that you establish baseline data. This will provide you with a reference point from which you can evaluate the effectiveness of your future pollution prevention projects. It is essential to obtain this information as soon as possible so that it is not affected by your reduction efforts.

* Mercury history profile

Your first step is to collect information about mercury from your plant's history. Mercury levels in sludges are more reliable because influent mercury received at treatment plants becomes concentrated in the sludges. Since the sludge is concentrated, sludge testing is not as vulnerable to the contamination problems and sensitivity limitations inherent in effluent testing. Therefore, sludge mercury data may be useful as a proxy for mercury levels entering the treatment plant and may indicate where source reduction efforts have the greatest potential for success.

However, sludge data are not without their problems. Before concluding that sludge data accurately represents mercury levels at a given facility, we need to be careful to verify test results and use some statistical methods to correct for variability. Initial steps in

the process should include a period for additional data collection, since individual samples from a medium as varied as sludge may not represent an accurate picture of long-term concentrations.

You may also want to establish mercury effluent histories with some of your commercial or industrial users. This will help you identify sources of concern and will help you analyze your success in implementing pollution prevention strategies at these sites. See "Direct Discharging Industrial Facilities," below.

Another potential baseline indicator is participation rates in clean sweeps or at permanent household hazardous waste collection sites in your community. These figures could provide you with a gauge of both the level of environmental awareness and

motivation for action in your area. This can be an important reference marker as you develop your community's mercury awareness campaign.

* Set a baseline year

Once you have collected your mercury history, you are ready to set your baseline year. The year should be picked based both on your confidence on the data and the level of mercury reduction activities or awareness in your community at the time.

* Establish program for assessing concentrations in the future

Establish testing limits

If your facility does not already have the capability to perform influent and collection system mercury monitoring using a method which provides a sensitivity 20 to 50 ng/L, you need to establish this ability.

How often will we need to test?

From the New Mercury Strategy
Mercury testing frequencies for POTW influent, effluent, and sludge have been identified for the four community groups identified in the “Wisconsin Strategy for Regulating Mercury in Wastewater.” The following is an excerpt from the Strategy that highlights testing requirements:

GROUP 1 - Milwaukee MSD, Madison MSD and Green Bay MSD - These entities will be expected to continue to perform monthly influent and effluent mercury monitoring and will require them to use a method which provides a sensitivity of 20 to 50 ng/L or lower. These facilities currently monitor their sludge six times a year.

GROUP 2 - All communities with design flows greater than 5 million gallons per day (MGD) - We will continue to require these facilities to perform monthly influent and effluent mercury monitoring and will require them to use a method which provides a sensitivity of 20 to 50 ng/L or lower. The information gained from the monitoring may be used to identify additional large communities for future

mercury reduction program development. These facilities currently monitor their sludge three to four times a year.

GROUP 3 - Communities which have at least two recent exceedances of the high quality sludge designation for mercury (17 mg/kg) and a relatively high, recent, average sludge concentration (see Appendix B of the Strategy for a list of communities based on currently available sludge data, however facilities may be added to the list, or deleted, as more data becomes available; all of these communities are relatively small in size) - At the time of permit reissuance, these facilities will be required through their WPDES permits to perform quarterly influent monitoring using a method which provides a sensitivity of 20 to 50 ng/L or lower and twice yearly sludge mercury monitoring for a period of two years. If high mercury levels are confirmed, monitoring must continue along with other requirements. If a known source can be easily identified, efforts should be made to reduce loadings from that source immediately. However if a known source is not easily identified and the two years of data show continued high levels of mercury, that facility must implement a PMP. If elevated mercury levels for a facility are disproved, that facility will be dropped from group 3 and no further requirements will apply.

GROUP 4 - Communities that discharge to the Lake Superior Basin -

The Lake Superior basin has been designated a demonstration area for the elimination of toxic bioaccumulating discharges. The municipal treatment systems that discharge to the lake, or to surface waters draining to the lake, will be given targeted information and access to networks of people and organizations focusing on the elimination of mercury discharges. Also, we will request these facilities to perform influent mercury monitoring using a method which provides a sensitivity of 20 to 50 ng/L or lower. We will request facilities with design flows greater than 100,000 gallons per day to perform this monitoring yearly. We will request smaller facilities to monitor only twice during the permit term. If monitoring indicates the presence of controllable sources, they will be targeted for source reduction activities. The City of Superior has a pretreatment program and will implement pollution prevention activities as part of that program, similar to those negotiated for Group 1 facilities. The City of Ashland also plans to undertake pollution prevention activities.

A single effluent test using a method which provides a sensitivity of 20 to 50 ng/L or lower will be required for facilities with design flows greater than 1 MGD as part of permit applications. Permits presently containing mercury limits or those being considered for limits based on detects in the effluent using the old standard testing will be reevaluated for any unusual circumstances. If the need for limits is clear, those limits will be retained. On the other hand, in the absence of a compelling need for a limit, they will be treated according to their fit into the above categories.

Municipal Mercury Testing Frequencies

	Sample Points	Current	This Strategy
Group 1	Influent	Monthly	Monthly*
	Effluent	Monthly	Monthly
	Sludge	6 x yearly	6 x yearly
	Contributors	*** none	***
Group 2	Influent	Monthly	Monthly
	Effluent	Monthly	Monthly
	Sludge	3-4 x yearly	3-4 x yearly
	Contributors	None	***
Group 3	Influent	None	Quarterly**
	Effluent	None	None
	Sludge	Annually	2 x yearly**
	Contributors	None	***
Group 4	Influent	None	Yearly or twice per permit
	Effluent	None	None
	Sludge	Annually	Annually
	Contributors	None	***

* Monitoring frequency may vary with ongoing studies.

** For Group 3, the influent monitoring and increased sludge monitoring frequency may be discontinued after two years if above-normal levels are not confirmed.

*** Monitoring frequency depends on whether contributors are identified, types of contributors, variability, etc.

Direct Discharging Industrial Facilities

From the New Mercury Strategy

Municipal facilities are generally similar to one another in their potential sources of mercury, and we already know a fair amount about the expected levels of mercury at the various points in these treatment plants. However, levels in industrial wastewater are largely unknown and likely to be greatly dependent on the various industrial processes. Therefore, while we believe source reduction is still the best approach to eliminate mercury release from industries, a somewhat different approach for determining the need for limitations, which involves more case-by-case analysis, is appropriate. Some individual discretion will be used to modify the following recommended general approach:

1. All industrial facilities will continue to be required to conduct effluent mercury monitoring with their permit applications. Primary industries, or others with identified sources of mercury, will be required to analyze at least 3 separate samples for this purpose. The analytical work for this monitoring must meet the same 20 to 50 ng/L or lower sensitivity requirement imposed on municipal facilities.
2. The analytical results obtained from the monitoring required in 1. above will be reviewed for quality assurance and representativeness. If mercury is not detected, no additional requirements will be imposed, but voluntary mercury minimization should be sought for mercury users. Detects should not automatically be considered to be representative of discharge quality.
 - 2a. Data sets which we conclude are representative of effluent quality will be used along with calculated preliminary effluent limitations to make determinations of reasonable potential and, where appropriate, effluent limits will be imposed in permits. If an effluent limitation is imposed, it should be accompanied by a mercury minimization plan requirement, as authorized by 40 CFR, Part 122.44(k), with annual reporting of identified sources and source reduction progress.
 - 2b. Data sets consisting of one or more detects, particularly if measured results are very near the detection limit, should be considered questionable. In these cases, we may choose not to impose mercury effluent limits. We will enter into discussions with permittees to determine what means can be agreed upon which will allow collection of information to help better define and/or reduce mercury levels in the wastewater. Appropriate language, as agreed to, will be included in the permit. If agreement cannot be reached, we will require, at a minimum, regular effluent monitoring. Examples of requirements we may consider agreeing to include:
 - 2b1) Facilities employing treatment with solids separation prior to wastewater discharge should monitor effluent levels and treatment plant influent levels using a method with a sensitivity of 20 to 50 ng/L or lower, and generated sludge levels for a rough mass-balance calculation. They should also investigate source reduction measures if the presence of mercury is confirmed. Reasonable attempts to implement source control for preventable sources should be undertaken. In-plant source stream and raw material monitoring and inventories may be needed to help identify where to concentrate source reduction efforts.
 - 2b2) Facilities not employing treatment with solids separation prior to wastewater discharge should continue effluent monitoring and perform intake water, in-plant source stream and raw material monitoring and inventories to help confirm or disprove the presence of measurable levels of mercury. Again, where necessary for quantification, the 20 to 50 ng/L sensitivity requirement should apply. Reasonable attempts to implement source control for preventable sources should be undertaken.
 - 2b3) After an appropriate term of monitoring (term depends on the frequency) the permittee should decide whether the presence of significant levels of mercury is confirmed or disproved. If it is apparent that the initial detects of mercury were false, there should be no additional requirements. If the conclusion is that mercury is present, the requirements for a mercury minimization plan and annual reporting, similar to 2.a. above, should become effective.

Establishing Goals

After you have set your baseline data, you should define a few simple goals for your Mercury Reduction Plan. Goals are broad and over-reaching statements that support your mission statement.

You will write objectives to support your goals as part of step six. Objectives differ from goals in that they are specifically measurable, concrete items that are established in order to help you achieve your goals.

You may choose to base your goals and objectives on a wide variety of parameters. For example, you may want to set them for:

- ◆ a specific increase in water quality
- ◆ a target number of implemented ideas
- ◆ a percentage reduction in your influent or sludge
- ◆ an increase in the use of clean sweeps or household hazardous waste collection sites
- ◆ an increase in the number of spill reduction plans implemented
- ◆ a decrease in the number of mercury-bearing products purchased for a particular sector
- ◆ a reduction of ITRS reports for mercury use or emissions in your area.

Your goals and objectives needn't be limited by the indicators listed above, but it is important that they be a motivational force for your project.

Identifying Barriers

As you begin to set broad objectives for your program, it is helpful to identify potential barriers to your success, and to assess the feasibility of overcoming these restraints. This can help shape your objectives as you set goals to remove these obstacles. Here are some barriers you may encounter in your community as you begin to implement a mercury reduction strategy:

◆ Limited resources

This can include everything from available staff time to the level of expertise available to provide education programs. The DNR statewide "Wastewater Mercury Specialist" may be able to help you identify educational materials for your community, and the DNR "Local Initiatives Specialist" may help you tailor these materials to fit your community. The Local Initiatives Specialist may also help with special training and education programs. Some funding may be available for your community education projects.

Additionally, The Solid and Hazardous Waste Education Center (SHWEC) at the University of Wisconsin-Extension provides waste reduction and pollution prevention assistance to Wisconsin businesses. Three pollution prevention specialists assist companies with on-site pollution prevention assessments and provide telephone consultations and written reports, training seminars and workshops, and satellite teleconferences. The specialists work through the County Extension Offices, which exist in all seventy-two counties.

SHWEC conducts pollution prevention assessments for companies. Each assessment includes information on pollutants generated, costs associated with the pollution, and costs associated with alternatives to the pollution, including prevention, treatment, and disposal. These services are provided free of charge.

◆ Organizational Issues

This class of barriers includes two categories of individuals: institutional and individual. Organizational

issues reflect the need for support from top management. As discussed in the “mission statement” chapter, it is crucial that upper management support the program through education and advocacy.

Individuals may resist change as you begin this new method of environmental protection. There are many benefits to going “beyond compliance” (see chapter 1, “Why Pollution Prevention for Mercury?”), but this approach is significantly different than the historical “command and control” technique.

Good communication in your facility may help to prevent some of these organizational or individual barriers. You may wish to consider announcing your new program with a kick-off memo or letter, and provide written recognition of employees working on the effort. Awards for winning ideas and frequent updates at staff meetings or on bulletin boards also helps keep motivation high.

BIBLIOGRAPHY

This document was designed to be a compilation of the best mercury information available to date. We are gratefully indebted to the work of authors below, without whose innovative and ground-breaking research this report would not be possible. Please note that many of these sources were quoted directly:

Lake Superior Pollution Prevention Strategy Implementation Plan: Recommendations for Achieving Zero Discharge in Wisconsin, Minnesota, and Michigan, Lake Superior Pollution Prevention Team, September 1995

Waste Prevention: Source Reduction Now, Kenneth Brown, Minnesota Office of Waste Management, February 1993

Where the Rubber Hits the Road: Measuring the Success of Environmental Programs, Howard Brown and Jim Dray, Total Quality Environmental Management, Volume 5, Number 3, Spring 1996

Wisconsin Strategy for Regulating Mercury in Wastewater, WDNR, December 1995

Zero Discharge Campus Proceedings, maintained by Wayne Schmidt, <http://www.great-lakes.net:2200/0/partners/NWF/campus/>, Revision of July 28, 1995

4 IDENTIFY SOURCES OF MERCURY IN YOUR COMMUNITY

- ✓ Potential sectors described
- ✓ Identify sources and specific industries in your community
- ✓ Measure or estimate relative contributions

SECTOR INFORMATION

There are several thousand applications of mercury in consumer and industrial products. Additionally, mercury can be a contaminant in chemical feedstocks or can be given off as a by-product during production processes. Combined, these factors make identifying mercury sources in your community a daunting task.

We have set out to help you manage your search by identifying nineteen sectors in your community that may be using mercury-containing products or processes. The sectors appear in Section Three:

- ◆ Agriculture
- ◆ Automotive
- ◆ Chemical Manufacturers
- ◆ Commercial/Business
- ◆ Contractors/Construction
- ◆ Dairy Farm
- ◆ Dentists
- ◆ Educational Institutions
- ◆ Food Service/Processors
- ◆ Hospitals/Clinics
- ◆ Household
- ◆ Industry
- ◆ Industry/Metals
- ◆ Laboratories
- ◆ Military
- ◆ Nursing Homes
- ◆ Paper Mills/Printing
- ◆ Wastewater Treatment Plants
- ◆ Veterinary Clinics

In each sector section that is listed, we have provided you with the following information, where appropriate:

- ✓ Where mercury-containing products or processes may be found in the facility
- ✓ Mercury-containing Product Focus
- ✓ Case Studies
- ✓ Action Ideas
- ✓ Sample Proclamation
- ✓ Current projects in the field

In addition, there may be several potential mercury sources in your community that were not identified in the nineteen sections listed above. For example, here is a list of additional potential sources under consideration by the Western Lake Superior Sanitary District:

- sewer pip cleaning
- vehicle washing
- painting/paint stripping
- industrial laundries
- emission scrubbers
- septic haulers
- pottery and arts

IDENTIFY SOURCES/SPECIFIC INDUSTRIES IN YOUR COMMUNITY

Your first step is to get to know your community. You may use several sources to inventory businesses or facilities. For example:

- ✓ Integrated Toxics Reporting System (ITRS) Data
- ✓ The phone book
- ✓ Classified Directory of Wisconsin Manufacturers
- ✓ Local and Regional Manufacturing Directories
- ✓ Dept. of Industry, Labor, and Human Relations (DILHR) List of Industries by zip code

Depending on the mercury sources and the complexity of the community, your search may require investigation into the following areas:

- Regulated (locally permitted) industry
- Non-regulated industry
- Non-regulated (not locally permitted) commercial and educational facilities (hospitals, clinics, laboratories, colleges, technical schools, schools)
- Professional offices not included in those listed above (e.g., doctor, dental offices)

We encourage you to obtain your initial inventory data through a variety of means. You may wish to rely on findings of other communities, carry out surveys or questionnaires regarding mercury use for that sector, and/or you may wish to carry out some wastewater sampling.

Sort your list of possible mercury contributors by sector categories.

This will enable you to identify sectors that may be important because of the sheer number of them in your community.

MEASURE OR ESTIMATE RELATIVE CONTRIBUTIONS

Here we hope to identify the proportional significance of mercury entering your wastewater treatment plant. A mass balance study would be ideal, because it may reveal some surprises and it would also provide important information for your baseline data (chapter 3). However, in some cases, sample analysis for a variety of sectors may be unrealistic due to time and cost restraints. As mentioned before, it is likely that there will be a range of facilities on your list, including regulated and non-regulated

industries, commercial and educational facilities, and professional offices. You may have no available data on some of these facilities. In these cases, it may be best to be creative in your inventory procedures. You may wish to carry a sample test for that sector, rely on findings of other communities, or carry out surveys or questionnaires regarding mercury use for that sector.

Of course, your study of relative contributions would identify a sector as a significant contributor if:

- ◆ mercury levels are high in effluent
- ◆ mercury levels are low in effluent but there is a high volume of discharge water from a single contributor
- ◆ mercury levels are low in effluent but there is a large number of contributors from that sector

To date, there has not been much data on relative contributions to a typical wastewater plant. The Western Lake Superior Sanitary District in Duluth, Minnesota has carried out some initial evaluations in preparation for their new document, “Blueprint for Mercury Elimination.” Here are some of their findings:

Mercury Test Results: WLSSD

Mercury Source	Mercury Concentration
Cooling Towers	No detect at less than 200 ppt
Dentists	0.1 grams/day per dentist
Emission Scrubbers	RDF 200 ppb Wood Chips 17 ppb
Hospitals	0.1 - 0.5 ppb
Industrial Laundries	0.7 ppb
Laboratories	1.0 - 5.0 ppb
Printing	No detect at 200 ppt
Residential - general (average)	0.1 ppb
Septic Haulers	50 ppb
Steam Generating Facilities	No detect - 0.08 ppb
University - general	0.5 - 4.0 ppb
University Chemistry Dept.	440 ppb
Users of Caustics and Acids	Caustic (hg cell) 10 - 300 ppb Caustic (membrane grade) <1 ppb KOH (hg cell) 7 ppb KOH (membrane grade) <1 ppb H2SO4 <1 - 12 ppm (depends on source)

Steps to estimate your relative contributions:

- ✓ Estimate quantities per day for each industry or each facility
- ✓ Add up your contribution estimates and compare to your baseline data from chapter 3.
- ✓ Are your contribution estimates roughly equivalent to your baseline data? Of course, there will be some mercury that enters your plant that will be unaccounted for (diffuse sources, rainwater). If your estimate is very far off, it may be time to recalculate or carry out additional testing.
- ✓ Assemble a list of sectors that you will highlight in your mercury reduction activities.

BIBLIOGRAPHY

This document was designed to be a compilation of the best mercury information available to date. We are gratefully indebted to the work of authors below, without whose innovative and ground-breaking research this report would not be possible. Please note that many of these sources were quoted directly:

WLSSD Mercury Zero Discharge Project: First Year Update, Western Lake Superior Sanitary District, June 1996

5 EVALUATE TOOLS AND OPTIONS

✓ Identify appropriate tools to reduce mercury

Spotlights:

- Developing a Publicity Campaign
- Educational Activities
- Recognition and Awards Programs
- Collection Programs
- Regulations

✓ Evaluate your options

✓ Make a list of your highlighted sectors and the tools you have selected for those sectors

* Determine appropriate tools to reduce mercury at highlighted facilities

Reduction Tools

(From Tim Tuominen and Lake Superior p2 strategy)

Once you have assembled a list of sectors to highlight in your mercury reduction work, it is time to consider the range of options for dealing with the potential source of mercury. The sector information in Section Three should provide a range of options needed for mercury reduction in a particular sector. In particular, refer to the “Action Ideas to Consider” and the “Sample Proclamations” at the end of each chapter. Although these were written for individual facilities, it will give you an idea of the types of reduction activities that could be organized on a community-wide scale for that sector.

Also, please note that the sector-based chapters in Section Three are written in a camera-ready format if you want to copy the information and distribute it to different facilities.

In general, there is a range of tools available to you for mercury reduction activities:

*** Education & Awareness Campaigns**

Educational/Consultation Opportunities

- assistance in identifying sources of hg
- on site p2 audits (SHWEC)
- P2 Education
- recognition / awards programs
- developing a publicity campaign
- improving awareness through surveys

Product Alternatives

- assistance in identifying alternative products
- increase demand for cleaner products/ technologies

You will probably find that there will be four audiences to be targeted for mercury reduction education activities:

- ◆ households
- ◆ commercial users
- ◆ industrial users
- ◆ manufacturers

*** Legislation and Regulatory Improvements**

- bounties on products that contain toxics
- remove barriers that promote use or improper use of toxics
- increased regulation or ordinance
- requirement of pre-treat or on-site treatment

*** Special Projects**

Collection Options

- retort/recycling info
- collection programs

Spotlight: Developing a Publicity Campaign

From "Developing a Publicity Campaign for Local Recycling Programs," Illinois Department of Energy and Natural Resources

One of the key elements of a successful mercury reduction program is a comprehensive, coordinated publicity campaign. The term "publicity" covers a wide range of areas, including public awareness, public interest, public education, changing behavior patterns, reinforcing behavior patterns, and expanding public participation.

There are countless techniques or methods which can be used to generate publicity. The ideas highlighted below are a few key ideas which can be employed to meet your objectives. Not all of these techniques may be feasible or applicable for your specific program.

General Publicity Considerations

- ✓ Relationship between publicity goals and program goals
- ✓ Is the primary emphasis on public interest in or awareness of the mercury reduction program, generalized public support, active public participation, or some other goal?
- ✓ Who will assume the major responsibility for generating publicity?
- ✓ Who will be the primary spokesperson for the program?
- ✓ Developing a public relations strategy: Who will do this? What is the relationship between the scope of the strategy and available funding to support this effort?

Targeting Your Audience

- ✓ Break down the general public into specific groups or segments of the population
- ✓ What are the awareness and support levels of each of these groups?
- ✓ What are the exposure levels of each group to mass media and other levels of PR?
- ✓ What messages and techniques of communication would appeal to each group?
- ✓ Set priorities for communicating information about your mercury reduction program to each of these groups.

Basic Forms of Publicity

- ◆ press releases
- ◆ press kits
- ◆ news conferences
- ◆ media interviews
- ◆ special events
- ◆ public service announcements
- ◆ paid radio/tv commercials
- ◆ newspaper or magazine advertising
- ◆ newsletters from politicians, companies, community groups
- ◆ brochures, pamphlets, flyers
- ◆ display at events like county fairs, malls, etc.
- ◆ inserts in water bills

Promotional Ideas for Your Local Mercury Reduction Program

General

1. Develop a key theme
2. Design a logo or symbol for the program
3. Organize a committee to oversee the publicity/educational program
 - increases a sense of involvement for diverse elements in your community
 - sends a message that there is broad-based support for the program
 - helps in distributing duties and responsibilities

Media

1. **Press releases** - whenever there is some event or announcement that is considered newsworthy, issue a press release to all area newspapers, radio and television stations. Be sure to include name of a contact person who can be reached by reporters.
2. **News conference** - the news release may be used to announce a news conference where a statement can be issued and reporters' questions can be answered. (News about the mercury reduction program may be one of several topics to be discussed at the news conference.)
3. **Press kit** - a news release or a news conference can have its newsworthiness enhanced by the distribution of a press kit.
 - Biographical information and black/white picture of public official/mercury reduction expert
 - Background information about the reduction project
 - Technical data about the project
 - Promotional brochures/inserts/materials
 - Brief fact sheet or questions/answers sheet
 - Testimonial letters endorsing project
 - Copies of prior news releases
4. **Media interviews** - contact local media with offer/request for municipal administrator and/or mercury reduction expert to appear on a public affairs program or call-in program, or be the subject of a newspaper feature story or column.
5. **Letters to the editor** - encourage friends and associates to write letters to the editor of local newspapers in support of the mercury reduction program.
6. **Public service announcements** - contact public affairs or community affairs department of radio and television stations for air time to promote or publicize a reduction event. Additionally, many newspapers have a listing of upcoming events.
7. **Paid advertising** - sometimes buying advertising time or space will increase the chances of getting straight news or feature story published or broadcast
8. **Cable access television stations** - contact to see if they will produce a show on mercury reduction. If you can produce your own videotape on mercury reduction, a cable access station may be able to broadcast it for free.

Events/Displays

1. Prepare a display for exhibition at municipal building and for events like a county fair or local festival, or a shopping mall or supermarkets
 - panels with pictures (DNR has a display available); videotape presentation
2. Organize a “Mercury Reduction Day” with as much diverse community involvement as possible.

Printed Materials

1. Newsletters - contact local companies, community groups, and politicians who publish newsletters and see if they will include a story about your reduction program
2. Brochures/flyers/pamphlets/posters - consider inserting into water bills

Other Considerations

1. Use a celebrity spokesperson to enhance amount of publicity
2. Use or develop an animal symbol or spokesperson (eg., smokey the bear)
3. Identify key opinion leaders in your community - they can act as effective communications links in transmitting the reduction message
4. Develop a master mailing list of groups and organizations who can be contacted to help publicize the program or specific events and increase public participation in collection programs, etc. (homeowner associations, business clubs, civic organizations, local colleges)
5. Publicize the names of sponsoring or cooperating public and private organizations
6. Include a telephone number that people can call for further information

The DNR may be able provide you with help in developing your publicity campaign. There are a number of educational activities that are best planned on a statewide level, and the DNR mercury specialist will assist in these activities. For example, the DNR statewide mercury specialist intends to use the information in Section Three to develop short brochures for each sector. You will be able to produce these brochures with your community information or plant name on it.

It is our hope that we will have another staff position who will assist in local mercury reduction efforts. This position would be funded from a USEPA grant that also has money allotted to help communities develop their educational and publicity campaigns.

Spotlight: Educational Activities

(from Pollution Prevention Week Activities Planning Guide for Trade Associations, Local Governments, and Environmental Groups, written by Andrew Murray from Local Government commission, Adopted by The Western Center for Pollution Prevention)

Mercury reduction work provides an excellent opportunity for positive relationships between businesses, trade associations, and environmental groups. There are a number of incentives for these groups to become involved in cooperative educational projects. Businesses which adopt pollution prevention strategies may reduce hazardous waste disposal costs, increase the marketability of their goods by becoming more environmentally sensitive, and avoid costly regulations. Trade associations develop an opportunity to demonstrate their interest in a sustainable economy that promotes economic activity and a clean environment. Environmental groups can inform their members and communities of the benefits of pollution prevention for adaptation in everyday lives and workplaces. Mercury reduction educational activities also offer the opportunity for environmental groups to form mutually beneficial partnerships with business organizations to promote joint goals such as environmentally safe sustainable economies.

Remember that you can rely on a large base of support for these activities. These outreach efforts should be implemented by your reduction team that may include wastewater treatment plant staff, trade associations, SHWEC representatives, local government representatives, industry representatives, and environmental groups.

Here are some collaborative educational activities for trade associations, governmental groups, and environmental groups:

✓ **Organize lunchtime brown-bag seminars about mercury reduction.**

An introduction to the concept of mercury pollution prevention and background information or case studies.

✓ **Present awards**

Awards programs are inexpensive and effective mechanisms for rewarding businesses for aggressively pursuing pollution prevention. The objective of an awards program is to recognize outstanding businesses, thereby increasing the marketability of their products. For more information, please see “Spotlight: Awards Programs,” below.

✓ **Convene an industry Blue Ribbon Committee on pollution prevention opportunities**

This activity gets businesses involved and allows them to make a statement in support of pollution prevention. This committee may wish to recommend pollution prevention changes for certain industries to undertake.

✓ **Produce, promote, and distribute a resource list of regulatory assistance and pollution prevention.**

There may be many materials about mercury reduction work in your business sector. Short of collecting the materials into a library yourself, you can provide interested member businesses with lists of available resources. Resource lists are relatively easy to assemble and leave the pursuit of the material to the businesses themselves, thus saving you time.

✓ **Coordinate facility tours of “clean shops”**

Nothing makes someone a believer like a local, successful example. If a member businesses has successfully implemented mercury reduction techniques, ask them to open their facilities to view by other businesses and participate in mentor programs.

✓ **Encourage businesses to set up mentorship programs**

Businesses should be encouraged to cooperate among themselves to promote mercury pollution prevention and to share technical resources at their disposal.

✓ **Host workshops on mercury pollution prevention**

Your organization could produce a workshop designed to introduce businesses to the concept of pollution prevention, the benefits associated with pollution prevention, and the resources available to support them in implementing mercury reduction programs. Make sure your workshop meets the needs of the businesses you serve.

Any educational information you distribute should include sector-specific information about:

- common products that have mercury
- alternatives
- how to dispose of old products

Planning successful activities

A few key elements will help you design, plan and implement an activity:

- ◆ Plan activities that are well suited to your organization
- ◆ Clearly define the goals and target audience of your activities
- ◆ Hold activities at convenient times and locations
- ◆ Identify key players and get their cooperation
- ◆ Contact your peers to find out about other successful pollution prevention activities
- ◆ Coordinate joint activities, copromote, and coproduce with local peers
- ◆ Widely promote your activities
- ◆ Don’t be afraid to try new things
- ◆ Evaluate the activity after it occurs

(from Pollution Prevention Week Activities Planning Guide for Trade Associations, written by Andrew Murray from Local Government commission, Adopted by The Western Center for Pollution Prevention)

Spotlight: Recognition and Awards Programs

Award and recognition programs are an important tool in your mercury reduction program. For many, these programs will provide the needed incentive to get involved and actively participate in your efforts.

The DNR will work with you to promote and celebrate the success of your partnerships. This may be done through press releases, scheduled presentations, or special recognition through an appropriate trade association or other group.

The following is a listing of award programs currently offered through the DNR.

Brogan Award

Department of Natural Resources' most coveted annual award, the John Brogan Environmental Achievement Award honors a business, municipality or environmental group for outstanding long-term efforts in improving the quality of life in Wisconsin.

Governor's Annual Waste Reduction & Recycling Award

This award is given annually to businesses, communities, schools, or individuals that demonstrate waste reduction leadership.

Governor's Award for Hazardous Waste Reduction

This award recognizes achievements in the reduction and management of hazardous waste. All state industries, institutions, businesses, and government entities are eligible for this annual award.

P/E/P Award

The Prevention, Environment, and Prosperity (P/E/P) Award is presented by Secretary George Meyer each month to a Wisconsin business in recognition of successful pollution prevention efforts. P/E/P award forms appear in the "Resources" section of this SourceBook.

Spotlight: Regulations

Ideally, the mercury reduction work in your community will be carried out voluntarily with partnerships from industries and trade associations. However, in certain instances it may make sense to adopt an enforcement policy. It is important to remember that this tool is available to you, but we recommend that you carry out your program under a voluntary basis.

In considering a regulatory approach to your mercury reduction work, you should consider a variety of options:

✓ Investigate municipal legal authority

- Existing municipal legal authority to control discharges of pollutants to the sanitary sewer system, e.g., the local sewer use ordinance, or other enacted legislation.
- Existing municipal procedures for implementing this legal authority, e.g., inventory, control, monitoring, and enforcement capabilities applicable to users of the local sanitary sewer system.

✓ Determine appropriate range of control tools:

- Regulatory: Establish local mercury discharge limits for (selected) users of the sanitary sewer system; issue or modify local discharge permits to applicable users of the sewerage system. Permits include wastewater sampling for mercury, analytical and progress reports, and compliance schedules. Compliance schedules require a Mercury Minimization Plan.
- Regulatory: Establish local mercury discharge bans for users of the sanitary sewer system. The discharge bans may be applied selectively, or broadly and generally, to users of the sanitary sewer system. The ban would preferably be coupled with a Local Mercury Collection Program.
- Semi-Regulatory/Semi-Voluntary - This mercury control program would not establish local mercury discharge limits for users of the sanitary sewer system, and would not issue permits to individual users. Selected users of the sanitary sewer system would still be required to submit Mercury Minimization Plans per A.2. above but with voluntary compliance schedules, limited wastewater sampling for mercury, and reduced analytical/progress reports. Local mercury bans and local mercury collection programs may or may not be used. Literature distribution and resource connection would continue per A. above.

* Evaluate Your Options

Assessing your options

Once a list of possible mercury reduction activities for a particular sector or facility has been compiled, an assessment of options that are technically and economically feasible needs to take place. Communities need to research all of the reasonable alternatives to processes that contribute to mercury emissions and document this in their plan. Many sources can be tapped for this work, including trade associations, trade magazines, vendors, consultants, customers, government agencies, and technical assistance programs. Employees, especially production workers, should be involved in coming up with alternatives as much as possible. You may wish to make a simple listing of options not chosen for implementation because of technical or economic reasons.

- From Pollution Prevention Plans: The Good, the Bad, and the Incomplete, MnTAP Source Summer 1993

In the sections above, we identified a number of tools at your disposal to help reduce mercury in your highlighted sectors. Here are the main categories that were presented:

- ◆ Educational Activities (information on product and process substitutions, etc)
- ◆ Publicity Campaigns
- ◆ Legislation and Regulatory Improvements
- ◆ Collection Options
- ◆ Recognition and Awards Programs

Specific activities that are associated with the categories listed above need to be evaluated for their potential success in your highlighted sectors. This requires a process of evaluation that helps to organize your efforts. Give priority to those efforts that are likely to:

- ✓ **Result in significant mercury reduction**
Elimination through process or product substitution is best; don't rely too much on control technology
- ✓ **Eliminate mercury as close as possible to origins of use tree**
Efforts that go to the source of mercury in products helps reduce the need for extensive public education efforts. (Example: Michigan's work with automobile manufacturers resulted in the upcoming phase out of mercury switches in automobiles. This will result in the elimination of 13 million switches - 10 tons of mercury - every year!)
- ✓ **Result in significant cost savings**
Companies may be able to reduce hazardous waste disposal costs, liability insurance, or eliminate spill response plans. See information on "full cost accounting" below.
- ✓ **Are relatively easy to implement**
Low-tech, low-cost projects, such as product substitution projects are a good bet. Projects that rely on public education efforts are often easy to implement with a good organizational plan.
- ✓ **Are highly visible to aid promotional efforts**
This helps encourage other mercury reduction projects

Information excerpted/adopted from Waste Prevention: Source Reduction Now, Kenneth Brown, Minnesota Office of Waste Management, February 1993

Some questions to consider in evaluating your options

Is the mercury just transferred to another media?

In evaluating your tools and options, it is important to determine if suggestions to reduce mercury in one waste stream are just transferring the mercury to another media. For example, wet scrubbers installed on incinerator stacks may just move the vaporized mercury into the wastewater effluent from the stack.

How are costs evaluated in a product substitution scenario?

Information from Waste Prevention: Source Reduction Now, Kenneth Brown, Minnesota Office of Waste Management, February 1993

Purchasing records give the quantity and cost of any product. These records establish the purchase cost and number used over a period of time. The cost of alternative products is established by obtaining price information from distributors.

Energy requirements

Energy requirements of different products can result in measurable cost changes for the organization. Energy of lighting, heating water, and running appliances can vary between products.

Toxicity reduction

Toxicity reduction will show a disposal cost savings if the change decreases waste handled as “hazardous waste.” Disposal of hazardous waste is usually paid by the gallon or pound. Each gallon or pound reduction results in a cost savings.

Labor costs

Safety and training are two factors that come into play with product or procedure changes. For safety, evaluators must know if the alternative product is at least as safe as the old one. For training, evaluators assess how much, if any, additional staff training is required to implement the reduction plan. These costs may be minimal compared to the need for a comprehensive mercury spill action plan if the mercury-laden product is kept in place. There also may be a reduction in regulatory reporting requirements if the mercury-containing product is replaced with a less toxic alternative.

Determining Life Span

The proposed, mercury-free alternative product may have a different life span from the current product.

There are two main ways to establish life span of the alternative product:

1. Examine the warranty. Warranties give the minimum life span of the product, guaranteed by the manufacturer.
2. Evaluate information supplied by other organizations using the product, by in-house staff that has experience with such products and by consumer or trade journals that evaluate such products.

Most purchasing officers are accustomed to evaluating the functional life versus the warranted life of different products. Once functional life is evaluated, costs over time for use of the alternative product can be determined.

A Word About Full Cost Accounting

Pollution prevention and waste reduction projects often do not compete on a level playing field because many costs of conventional production processes are lumped into “overhead” and are thus “hidden.” These include environmental costs, premiums, personnel costs, and future liability.

Full cost accounting (FCA) makes the connection between costs and the processes responsible for them. FCA also attempts to more accurately trace and account for “direct costs.” This requires holistic thinking about the production process.

“Hidden” and “direct” costs are a function of the raw materials and technology used in the production process. FCA simply helps to identify these costs so they can be minimized. Experimenting with relating costs to the processes that create them is also consistent with the goals of total quality management. Developing a deeper understanding of the processes that drive costs leads to the fact that management will then be better equipped to control total costs.

For more information on Full Cost Accounting, please contact Bob Baggot at the Wisconsin DNR, (608) 264-8951.

From the brochure, “Full Cost Accounting: Sharpening the Focus of Your Business,” WDNR, 1996.

More information about Financial Analysis of Pollution Prevention Projects

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The list of educational pieces about pollution prevention cost accounting appeared in the fact sheet, “Financial Analysis of Pollution Prevention Projects,” Ohio EPA, Number 33, October 1995

*** Make a list of your highlighted sectors and the tools you have selected for those sectors**

List your highlighted sectors and the tools you hope to use for mercury reduction in those sectors. For broad-reaching activities, you may wish to list the sectors that would be targeted for that specific activity.

For example, a community may decide that the four highlighted sectors for phase one of their reduction program are dentists, hospitals, laboratories, and metal finishers. (please note that the list of highlighted sectors and corresponding tools will change from community to community.) Their reduction team has targeted tools to implement in these sectors:

Mercury Reduction Program
Sample Community: Highlighted Sectors and Tools, Phase 1

Dentists

- ✓ Install chair side or collection traps
- ✓ Bulk mercury collection program
- ✓ Educational campaign

Hospitals

- ✓ Replace mercury-containing thermometers and sphygmomanometers
- ✓ Establish a battery collection program
- ✓ Institute a red-bag educational program
- ✓ Examine laboratory chemicals
- ✓ Educational campaign

Laboratories

- ✓ Eliminate use of mercury thermometers
- ✓ Replace mercury-containing compounds and reagents with mercury-free alternatives
- ✓ Educational campaign

Metal Finishers

- ✓ Research chemical solutions used for material feedstock
- ✓ Use non-mercury cleaners and degreasers
- ✓ Replace mercury-containing compounds and reagents in laboratories with mercury-free alternatives

Our sample community has also decided to carry out two broad-reaching educational and collection programs: one for batteries, and the other for thermostats.

<p>Battery Collection Program: Targeted Sectors</p> <ul style="list-style-type: none"> Commercial Facilities Contractors Educational institutions Hospitals/Clinics Household Industry Laboratories Nursing Homes 	<p>Thermostat Collection Program: Targeted Sectors</p> <ul style="list-style-type: none"> Contractors Households
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Zero Discharge Pilot Project Work Plan, Western Lake Superior Sanitary District, January, 1995

6 SET OBJECTIVES AND IMPLEMENT

- ✓ **Setting objectives**
- ✓ **Developing performance measures**
- ✓ **Providing incentives**
- ✓ **Implementing your reduction plan**

Setting Objectives

Now that you have written a mission statement, established partnerships, set preliminary goals, inventoried your community for sources of mercury, prioritized those sources and evaluated reduction tools for your priority sectors, it is time to set more specific objectives for your mercury reduction project.

(The following was adapted from Zero Discharge Campus Proceedings: Implementation Systems, facilitator, Bill Lanen, found at web site http://www.great-lakes.net:2200/0/partners/NWF/campus/pro_imp.ht and from "Where the Rubber Hits the Road: Measuring the Success of Environmental Programs," Howard Brown and Jim Dray, Total Quality Environmental Management, Spring, 1996)

We will continue to use our sample from step # 5. This community has decided that their four highlighted sectors for phase one of their reduction program are dentists, hospitals, laboratories, and metal finishers. Their reduction team had also targeted tools to implement in these sectors.

Now that tools have been identified for highlighted sectors and activities, there are several key components to implementing and evaluating the designated tools identified for each sector:

- ✓ Develop a team and establish a strategy - set goals
- ✓ Establish a baseline
- ✓ Decide on key performance measures - both qualitative and quantitative
- ✓ Be sure incentives and the resources to provide incentives are available
- ✓ Divide plans into achievable increments of one to five years
- ✓ Determine the extent to which a program is voluntary and involuntary

Developing Performance Measures

Adopted from "Where the Rubber Hits the Road: Measuring the Success of Environmental Programs," Howard Brown and Jim Dray, Total Quality Environmental Management, Spring, 1996

To assess your mercury reduction program effectiveness, you must design strategies which can be measured. There are two different ways to measure progress, and both are necessary to construct a completed picture of performance:

1. **Quantitative** - analytical measurement of actual change in environmental performance
2. **Qualitative** - measurement of proactivity, the degree to which a community is actively pursuing implementation of the strategy

Quantitative Analysis

Quantitative measures document consumption of mercury-laden materials or analyze mercury levels in water samples. The data collected may be obvious. Two problems arise, however: (1) is the desired data available from an existing or practical accounting system? and (2) How should the information from different facilities be normalized?

It is not possible to measure every aspect of environmental performance without creating a huge data collection and reporting burden, but it is possible to create a system of metrics which documents the critical indicators of overall performance.

Qualitative Analysis

Qualitative measures document "process" issues as opposed to quantitative "output" issues. For example, many strategic goals may have long lag times before implementation shows performance results. However, it is important to verify that actions are being taken to make progress toward your mercury reduction goals, whether or not the impacts will immediately show up in the monitor data. It is important, therefore, to dedicate some aspect of the metrics system to evaluate the process - the degree to which management systems are being put in place to achieve environmental goals.

For example, the following methods may be used to periodically monitor progress in mercury reduction:

Quantitative

- ✓ Compliance with local mercury discharge limits by individual users of the sanitary sewer system based on wastewater sampling and analysis.
- ✓ Progress on implementation of mercury reduction programs based on wastewater sampling and analysis.
- ✓ Participation in local mercury collection programs based on the numbers of participating individuals and on the volumes of collected mercury-containing materials.
- ✓ Trends in mercury levels in the municipal sewerage system as detected by the municipal collection system, influent, effluent, and sludge monitoring program.

Qualitative

- ✓ Progress on implementation of individual Mercury Minimization Plans including mercury use substitution, site remediation, and mercury spill plan development based on reporting and inspections.
- ✓ Community user group participation in municipal, WDNR, SHWEC, and WDOD mercury pollution prevention outreach programs.

Setting Objectives

- ◆ The objectives must be sufficiently short-term to make achievement feasible and accessible. Estimate sub-objectives that are reachable and lead to successes.
- ◆ For the objectives to become part of the strategy, everyone must agree. However, stakeholders within the community often have competing goals, which need to be reconciled. You may be able - through education - to spread an ethic, which can help reconcile competing interests.

Providing Incentives

(From Zero Discharge Campus Proceedings)

All plans have either explicit or implicit mechanisms put in place to further their goals. These mechanisms are incentives. A key issue in developing an implementation plan for mercury reduction work is how to get people to work toward goals. People need an understanding of what they need to achieve.

Incentives show people the reasons why they should want to do something and how they might benefit. For example, if a program saves money by reducing mercuric waste, the facility should put the money back into the program. Workers tend to be more willing to change their behavior when they see a return of the monetary savings made for the company--this kind of give and take is how coalitions are developed.

The nature of the program (voluntary versus involuntary) influences what can be done and how incentives should be provided. Voluntary programs require people to be interested, whereas organizational (involuntary) programs do not rely on a high level of individual interest. However, organizational programs have other advantages. They are systematic with the pertinent information and efforts going beyond any one department. Organizational programs have the potential to be the most effective and far-reaching. Voluntary efforts can be counterproductive when others' actions are not known or understood. However, there is nothing to prohibit having voluntary and mandatory programs coincide. (For more information, see chapter 5, Spotlight: Regulations.)

Public relations and outreach to the media are good incentives. Public relations serves to educate a broader audience and provides recognition for constructive and positive activities. Communication is important because the reporting of progress can provide incentives. In addition, the education component of outreach and other incentives help to spread the ethic of your reduction program.

Implementing Your Reduction Plan **Steps once you have identified a significant mercury contributor**

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Identify the source of mercury in the facility (where/ what) <ul style="list-style-type: none"> - Assistance in identifying sources of mercury (information in chapter four is a good start) - On-site pollution prevention audits (help available from SHWEC) 2. Promote concept of pollution prevention with owners/operators 3. Use an assessment list to determine best ways to reduce or eliminate the source <ul style="list-style-type: none"> - improved housekeeping - substitution of raw materials - product alternatives - process changes - improved management practices - requirement of pre-treat or on-site treatment | <ol style="list-style-type: none"> 4. Requesting Facility-specific Pollutant Minimization Plans <ol style="list-style-type: none"> a) identification of mercury used in processes or contained on site and the potential for release of mercury; b) evaluation of processes or product substitution which would eliminate the use of mercury on site, with costs and schedule of implementation; c) evaluation of site contamination with mercury and proposals for remediation, with costs and schedule of implementation; and d) mercury spill reduction plans. |
|---|---|

(some from TimTuominen)

Basic steps in developing an educational campaign for a specific sector

These steps were developed by The Solid and Hazardous Education Center (SHWEC), who employs a methodical pollution prevention strategy that places emphasis on building trust and support with local businesses and industry through outreach and education.

(from Preventing Pollution in our Cities and Counties: A compendium of Case Studies, Rock County, Wisconsin)

✓ **Identify industrial clientele**

This would include the list you created in the beginning of this chapter. It should include the names of specific companies and should be sorted by sector categories.

✓ **Prioritize the outreach effort**

Targeting those companies that could be best served by an outreach effort will increase your effectiveness and increase your likelihood of success.

✓ **Establish local support**

Identify those persons in your district who could provide you with the focal and organizational support to carry out the outreach effort. This is a good time to expand on the partnerships you began in chapter two. You may also consider working with local solid waste managers because they are already working with the major businesses and hazardous waste generators in your county.

✓ **Preliminary publicity**

This serves to introduce the project in a positive atmosphere. You may wish to start off with a press conference or a special activity at a trade association meeting. All of the interested parties should be involved at this

kick off event. This initial activity should provide a focal point of interest and establish a firm starting point and timetable for outreach activities. A brochure may also be developed at this point. You may also wish to provide technical assistance and fact sheets (many of these can be developed in conjunction with the statewide mercury specialist). News articles, and letters to trade organizations and local businesses would also be appropriate at this point.

✓ **Contact companies directly**

The companies that you have identified as having a high potential for mercury reduction based on their waste streams and manufacturing processes may be contacted first by letter, then by phone, followed by a personal visit. The initial letter gets “a foot in the door” by summarizing the program, and the phone call explores potential interest at the firm and arranges for a person to person meeting. The meeting will afford you the opportunity to explain in detail the benefits of your mercury reduction project and to better understand the issues of concern to the company. The point of contact within the company is typically an influential person likely to be very concerned with hazardous waste at the facility. This may be the owner, CEO, plant manager, or environmental/safety coordinator.

SHWEC representatives may be able to conduct (non-regulatory) on-site mercury reduction opportunity assessments during your intensive outreach sessions. In these situations, a SHWEC representative tours the facility

and notes ways to implement mercury reduction techniques. After the tour, the SHWEC representative meets with the company representative to clarify things that were observed during the tour. Follow-up reports are sent to each firm, in which specific alternatives are presented to help minimize or eliminate mercury use or contamination.

✓ **Follow-up evaluations of industry contacts**

Face to face surveys measure what progress a company has made since receiving their mercury reduction assessment report. This helps to fine-tune the outreach effort, maintain relationships with firms, give companies opportunities to request additional assistance, and help companies recognize their own achievements. Successful efforts should be publicized and used to build the case for mercury reduction activities in other firms.

The implementation of the above plan would require the development of the following materials:

- ◆ outreach brochures
- ◆ press releases
- ◆ press conference remarks
- ◆ business contact sheets
- ◆ progress reports
- ◆ business approach letters
- ◆ business evaluation letter
- ◆ evaluation questionnaire

How much time passes before results are measurable at a particular facility?

*Information from Waste Prevention:
Source Reduction Now, Kenneth Brown,
Minnesota Office of Waste Management,
February 1993*

The implementation of a mercury reduction program at a particular facility is dependent on a number of factors that will effect the rate at which results will be measurable. For example, much depends on how much cooperation exists between the management, the reduction team, and the purchasing department at a particular facility. With product substitution projects, some of the data required for assessment comes from the purchasing department staff. These people have resources to identify many alternative products. For a program to function, it must be clear that information is gathered to aid the purchasing department in its decisions.

Likewise, front line staff, such as factory workers, doctors, and researchers need to be included as ideas evolve. Without goodwill even the best ideas will not succeed. With cooperative rather than competitive attitudes in place, product evaluations proceed smoothly.

At the very least, it will take three months for the preliminary phase of a mercury reduction program at a facility. During this time, the following activities should happen:

- ✓ Select team
- ✓ Build support
 - how does the mercury reduction program fit into the facilities mission statement?
 - regulations?
- ✓ Educate staff
- ✓ Source identification
- ✓ Communications
 - should be routine and regular (newsletter?)
- ✓ Determine your baseline

With cooperation in place, measurable results for a particular facility are normally available in six months. These results can be used to motivate further change. Some program evaluation can also take place after this period of time. Barriers to the program can be addressed. Reports on the success of product or behavior changes already implemented are made.

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7 MEASURE AND PROMOTE YOUR SUCCESS

- ✓ Measure Success
- ✓ Develop a system to process your results
- ✓ Identify gaps in knowledge
- ✓ Enforce your policy
- ✓ Promote your success

Following adopted/excerpted from "Where the Rubber Hits the Road: Measuring the Success of Environmental Programs," Howard Brown and Jim Dray, Total Quality Environmental Management, Spring, 1996

Develop a system to process your results

Providing an analysis of your sector-based projects will be easy once you have set up a system of goals as established in chapter 6, "Set Goals and Implement." Remember that for each sector or activity that you will analyze, you need to:

- ◆ Develop a team and establish a strategy - set goals
- ◆ Establish a baseline
- ◆ Decide on key performance measures - both qualitative and quantitative
- ◆ Be sure incentives and the resources to provide incentives are available
- ◆ Divide plans into achievable increments of one to five years
- ◆ Determine the extent to which a program is voluntary and involuntary

Measurement is important in helping stakeholders or advocates know where to invest their efforts. The goal of environmental measurement systems should be to:

- ✓ Keep it simple - be easy to use and understand, and at the same time be specific enough to ensure that measures have meaning.
- ✓ Identify key indicators that construct a picture of overall environmental performance.

Now it is time to establish a system that will evaluate the results of your decisions from chapter 6.

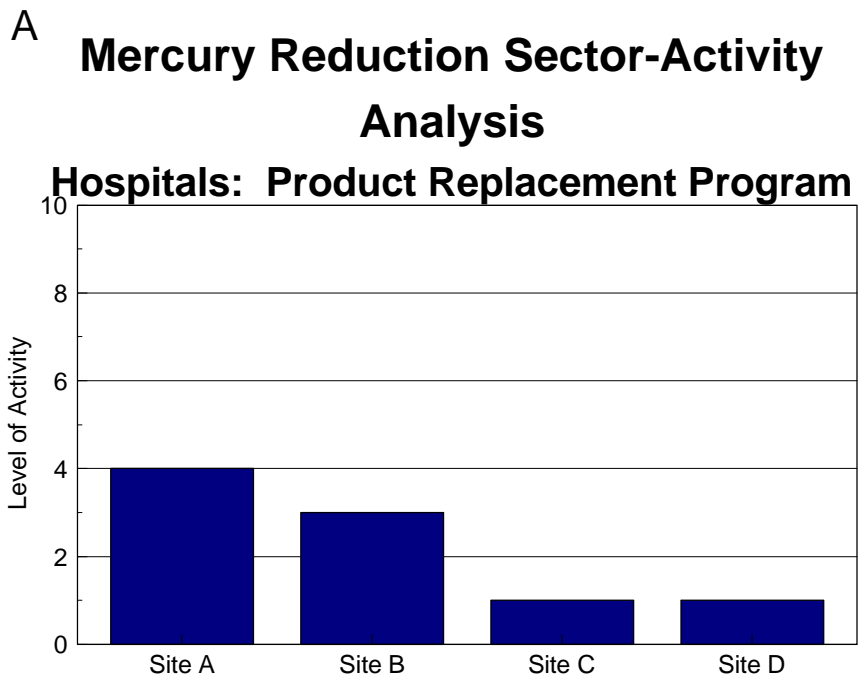
Quantitative Measures

Measurements of materials dropped off at a clean sweep site, mercury-containing products purchased for a particular facility, levels of mercury in water samples, etc. can be charted quarterly against your baseline data for these figures.

Qualitative measures

A qualitative audit or evaluation could be a self assessment conducted by each facility for itself on a quarterly basis. These could be compiled into sector - based reports. The following analysis will continue to use the sample community from chapter 5. This community has decided that their four highlighted sectors for phase one of their reduction program are dentists, hospitals, laboratories, and metal finishers. Their reduction team had also targeted tools to implement in these sectors.

The following charts show a sample of the results of a qualitative metrics process. For each targeted goal in the community’s mercury reduction strategy, sites have evaluated their progress on a 0 -10 scale. The community defined each point on the scale, ranging from 0= “no activity” to 10=”audited results documented and reviewed; the process is ongoing and in a continuous improvement mode.” With a quick glance, the mercury reduction team can tell which of the environmental initiatives are on track and which are off track or mixed. Sites can also use the system to brag about their achievements or to identify leading practices that should be spread more widely. The results can be used to determine how attention and resources should be invested. For example, Chart A shows that none of the sites has made significant progress integrating hospital mercury product replacement programs. This means that a concerted effort would be devoted to technical assistance and training.

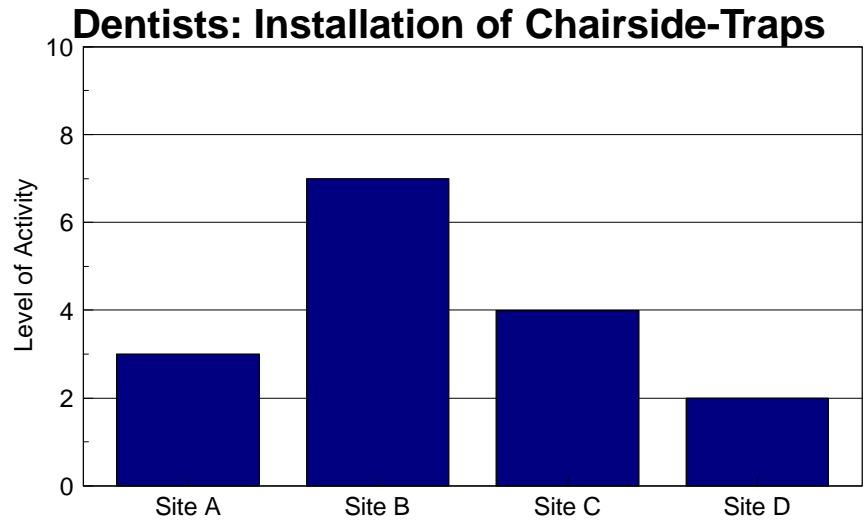


Adpoted from Brown and Dray, Total Quality Environmental Management, Spring, 1996

Chart B shows opportunity for sharing best practices among sites. Chart C shows that all sites consider battery collection programs a priority and have acted accordingly.

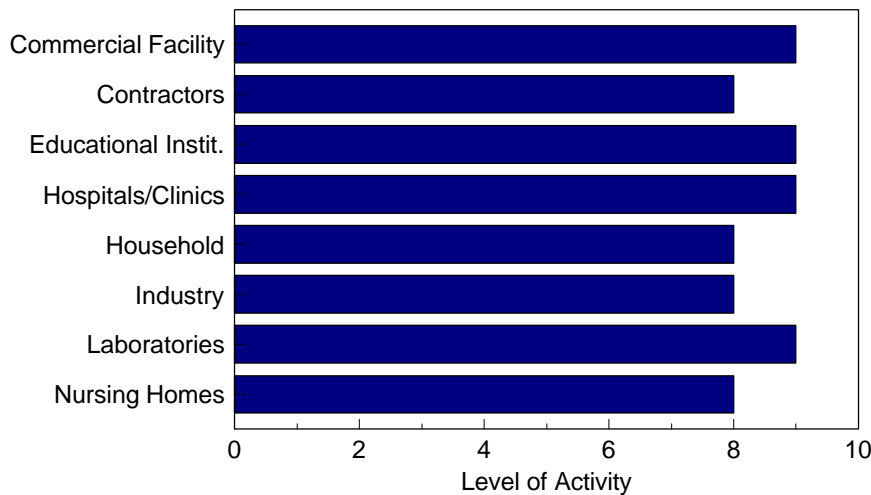
As demonstrated, this type of analysis can occur for a specific activity in a certain sector (sample charts A and B) or can analyze a educational or collection effort across sectors (sample chart C).

B
Mercury Reduction Sector-Activity Analysis



Adpoted from Brown and Dray, Total Quality Environmental Management, Spring, 1996

C
Mercury Reduction Activity Analysis
Battery Collection Programs



Adpoted from Brown and Dray, Total Quality Environmental Management, Spring, 1996

Identify gaps in knowledge

You may find in identifying your highlighted sectors and tools that there are several areas that have not been well researched. If communities compile lists of needed information or research areas, the DNR may be able to pursue additional grant funding to examine these areas.

For example, we know that information is needed about the following:

- ◆ Mercury trapped in sanitary sewer systems
- ◆ Methylation in wastewater systems
- ◆ Residential Greywater
- ◆ Non-Point Discharges
 - Coal-fired Fuel Air Deposition
 - Run-off
- ◆ What conditions in treatment plants result in more or less effluent removal of mercury

Enforce your policy

Depending on the type of mercury control program used by a community the following methods may be used by that community to enforce program expectations:

- Enforce local sewer use ordinance mercury effluent limits, monitoring, reporting, and compliance schedule requirements for users of the sanitary sewer system.
- Enforce local adopted resolutions on discharges of mercury to the sanitary sewer system including expectations for user monitoring, reporting, and Mercury Minimization Plan implementation.
- Enforce local adopted bans on the discharge of mercury to the sanitary sewer system as discharges are detected.
- Actively continue communication with the mercury using community and publish the accomplishments (or lack of accomplishment) of mercury reduction.
- Actively continue monitoring of mercury sources and sewerage system and publish the reductions (or lack of reductions) in mercury levels.

Promote your success

Many of the techniques described in chapter 5, “Spotlight: Publicity Programs,” will be helpful here. For example, you could publicize your success through press releases, news conferences, media interviews, special events, public service announcements, newsletters, brochures or pamphlets, displays at county fairs or through inserts in your water bills - the possibilities are endless. Give yourself some credit for all of your hard work!

BIBLIOGRAPHY

The information included in this chapter was gathered from the documents below; some material may have been quoted directly from these sources:

Where the Rubber Hits the Road: Measuring the Success of Environmental Programs, Howard Brown and Jim Dray, Total Quality Environmental Management, Volume 5, Number 3, Spring 1996