



Twelfth Annual Governor's Pollution Prevention Awards



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**Hosted by:
Illinois Waste Management and Research Center,
a division of the Department of Natural Resources**



Twelfth Annual Governor's Pollution Prevention Awards



The 1998 Governor's Pollution Prevention Awards are presented to honor businesses and other organizations in Illinois that have successfully reduced the generation of wastes and the use of toxic chemicals. These wastes include toxic air contaminants, wastewaters, infectious wastes, energy, plus hazardous and other industrial process wastes. By recognizing the outstanding achievements of these organizations in pollution prevention, it is our hope that others will be encouraged to do their share in preventing pollution at the source.

Since 1987, the Illinois Waste Management and Research Center has worked with the Governor's Office and the Illinois Environmental Protection Agency to recognize outstanding pollution prevention efforts in our state. By adopting pollution prevention strategies, it has been shown that businesses can increase the efficiency of their operations and reduce their impact on the environment. Organizations are recognized in the following categories: small, medium, and large industries, continuous improvement, trade organizations, educational institutions, vendors, and communities.


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Award Winners



Large Industry Category (more than 500 employees)

Caterpillar Inc.—Decatur

Caterpillar's manufacturing facility in Decatur implemented three pollution prevention projects during the last year. The first project involved flushing solvent used to clear paint lines when using two-part paint. Customer demand coupled with the need to move equipment within a shorter timeframe for shipping necessitated the continued use of the two-part paint rather than a more conventional paint which could have been held in the lines for a longer time period. A solvent distillation unit was researched and purchased to recycle the flush solvents. Now, approximately 85% of the flushing solvent is distilled for reuse, avoiding purchase costs for 59,565 gallons of virgin solvent. Also, \$158,600 is saved by no longer having to pay for disposal of the waste solvent.

Another project undertaken at the Decatur facility involved sorting out and refining a logistical nightmare that was causing production delays. The manufacturing operations used 2,306,760 lbs. of weld electrode and flux which were delivered to the facility in 50 lb. and 60 lb. quantities, on small spools, in cardboard boxes, on wooden pallets, wrapped in plastic. All the work involved in ordering, handling, storing and disbursing this product was inefficient, so the company formed a Continuous Quality Improvement team to address the issue. After careful evaluation, the team decided to use a local welding supply distributor to order, store, and deliver all needed weld electrode and flux directly to points-of-use. The distributor would also remove and recycle all the recyclable spools for no extra cost. By the end of 1997, 90% of the facility's welding stations have been converted to 1,000 lb. recyclable spools. With the old process, 88,000 pounds of cardboard, wood, plastic, and wire associated with the smaller spools were sent to landfills. With the conversion, virtually all scrap has been eliminated. Other benefits have included better weld quality due to a greater consistency of stock as well as a decrease in back injuries as the welders no longer need to lift the 50 and 60 lb. spools. Caterpillar realized annual cost savings and avoidance of \$825,524 due to this process improvement.

The third project is a community outreach project that demonstrates the facility's commitment to the environment without imposing the company's philosophies. The project, entitled "Intentional Environmental Education Rather Than Incidental," is a program to help put environmental awareness into the curriculum of all area schools and place environmental issues directly into the educational path to stimulate an active level of awareness rather than a passive or reactive level. Using educational materials developed by the Air & Waste Management Association, the company provided instructional manuals for each school in the entire Macon-Piatt County Regional Office of Education district. The manuals included the topics of air quality and nonpoint source pollution prevention for grades K-2, 3-5 and 6-8. A four-hour workshop was held to introduce the awareness program to educators throughout the region. This project was a community effort, involving not only Caterpillar staff, but representatives from the education community, environmental groups, and governmental agencies.

Navistar International Transportation Company

Navistar's Melrose Park Plant assembles large engines. In 1997, their pollution prevention projects resulted in a 93% reduction in hazardous waste. Some of the methods used to bring about this reduction include replacing low flash mineral spirits with non-hazardous cleaners in both cold parts cleaning and the engine paint process and eliminating methyl ethyl ketone (MEK) with water to clean paint nozzles. Eight new cold parts cleaning tanks filter and distill non-hazardous solvent for reuse. An energy management system was also installed at the facility, reducing energy costs by approximately \$500,000 per year. A pollution prevention committee with members from every business unit of the plant investigate each waste stream, develop minimization plans, and set priorities. Other environmental efforts throughout the facility resulted in additional savings of approximately \$240,000 for 1997.

Medium Industry Category (151 - 500 employees)

Borg-Warner Automotive

Borg-Warner Automotive makes electromechanical and mechanical exhaust gas recirculation valves, emission control valves, and fuel and vapor controls. BWA has been aggressive in searching for ways to improve pollution prevention methods; employees are encouraged to seek out process and method improvements and opportunities that will reduce the volume and/or toxicity of waste produced, enhance the recycling efforts, and reduce or prevent waste generation.

Two years ago, BWA began regrinding waste plastics generated from an injection molding process. The reground plastic was then either reused or sold. By the end of 1997, 90% of the waste plastic was being reground realizing a cost savings of more than \$46,000 per year.

Another P2 process involved a unique filter process for on-site reclamation of coolant, which extends the coolant's useful life and has positively affected the waste stream. This system has saved BWA \$4,000 per year. Returnable containers on both in-bound and out-bound product has been expanded by 10% in the last year and has also reduced the company's waste stream. An assessment in April of 1998 of BWA's Environmental Management System found them to be in compliance with ISO 14001:1996, a noteworthy distinction of their commitment to environmental issues.

Ethyl Petroleum Additives, Inc.

Ethyl Petroleum Additives, Inc. is a manufacturer of additive products designed to enhance the performance of lubricants. The Sauget plant produces a wide variety of detergents, dispersants, corrosion inhibitors and anti-wear products. Six projects at Ethyl greatly contributed to waste reduction, improved process operability, and improved cost of manufacturing. The Product Filtration Improvement Project reduced the amount of product lost during filtration. Since the project began in late 1996, three railcars of product with a value of \$250,000 were saved from the landfill. Another savings was achieved in 1997 by examining the use of Alkylbenzene Sulfonic Acid (ABSA) in the production process. This use caused a filtration problem, necessitating the venting of sulfur dioxide (SO₂) into the atmosphere. After careful examination of the final product's filterability, the practice of blowing the ABSA receiver tank was discontinued, resulting in the elimination of 63 tons/year of SO₂ point source air emissions. Maintenance savings are approximately \$24,000.

Another project reduced the initial charge of excess alcohol to the reactor vessel and also allowed operations to better control the quantity and rate at which waste alcohol condensate discharged to the sewer system. This project resulted in a \$147,000 savings in annual raw material usage.

A Catalyst Reduction Project reduced the catalyst usage at Ethyl by 30,000 lbs. (20%), saving approximately \$22,750. This project also improved tank cleanout methods and waste disposal costs. The projected annual impact of this project is 93,000 lbs. of catalyst waste reduced at a cost savings of \$70,500. A Fluorescent Lamp Replacement program is eliminating hazardous mercury waste. Approximately 1,200 "green" lamps have been installed representing about 60% of the total light tubes on the plant site. Eventually, all bulbs will be replaced, totally eliminating this hazardous waste product.

Prior to the implementation of the Styrene Safety Stock Elimination Project, the Sauget plant disposed of approximately 13 drums (5,850 lbs.) per year of polymerized styrene as ignitable hazardous waste. Because of its short shelf life it can easily polymerize or solidify while in storage creating waste. A new inventory program allows personnel to better anticipate demand and a local distributor now supplies this raw material in a "just-in-time" fashion to meet production needs. This saves Ethyl an estimated \$7,700 per year in raw material and disposal costs.

Honeywell MICRO SWITCH Division—Galena

MICRO SWITCH is the world's leading manufacturer of switches, sensors and related control system solutions. The manufacturing processes in seven Illinois locations include metal working, plastic molding, electroplating, stamping, welding, assembly and product testing. Through the assistance of IEPA's Office of Pollution Prevention summer intern program, a graduate-level chemical engineer evaluated reduction possibilities and potential elimination of wastewater treatment or discharge relating to a zinc phosphating operation. From the old process, which used four hazardous materials to clean and undercoat the diecast parts prior to electrostatic powder coating, the new process (iron phosphating) uses only one hazardous material (corrosive) and produces a small enough volume of water that it can be neutralized and evaporated in an existing evaporator used for floor mop water and water-based coolant. The facility previously generated 176,000 gallons of wastewater and 825 gallons of zinc phosphate sludge annually. The new operation generates only 5,600 gallons of wastewater per year, resulting in 60 gallons of iron phosphate sludge production. The wastewater and sludge volumes were reduced 97% and 92% respectively. Cost savings are estimated to be about

218 tons. New 'arc snubbers,' a technology that maximizes precipitator efficiency, led to 20% reductions in air particulates at another generating station while conversion from oil-burning to natural gas generation at the Collins Station reduced emissions by 1800 tons of SO_x, 300 tons of NO_x, and 137,000 tons of CO₂. ComEd's nuclear stations improved the sorting of radiologically-contaminated waste from non-contaminated waste materials and saved well over 7,500 cubic feet of landfill space and over \$2 million. The Dresden Station began using ultraviolet disinfection in their sewage treatment plant thus eliminating 1,700 lbs. of chlorine use and discharge annually while saving \$2,500/year. The company also began a company-wide communications program using a sequence of posters and paycheck inserts that stress personal commitment, cross-departmental teamwork, and fulfillment of the corporate environmental policy.

ITT McDonnell & Miller

ITT McDonnell & Miller produces a variety of premier boiler controls and instruments for the residential and commercial marketplace. Over the last five years the company has switched from using 13,200 gallons per year of trichloroethane, a solvent that is a hazardous air pollutant, to an aqueous cleaner. They also reduced the use of hazardous mercury switches in their boiler controls by 58% between 1993 and 1997 to a safer electronic snap-switch that offers superior reliability and improved accuracy. This conversion required extra effort on the part of the company as customers and vendors were accustomed to the traditional mercury switch and were somewhat resistant to the change. Through product training and on-site presentations, the ITT McDonnell & Miller staff were able to convince the marketplace that the conversion would benefit everyone, including the environment. Since 1997, the company has been certified under ISO 14001 that requires a documented environmental management system. The ISO 14001 certification was a first in several ways—the first of ITT Industries' 80 U.S. units and the first company in Illinois to receive this designation. Many environmental practices are currently underway at the company including reducing electrical consumption, water consumption, and off-site disposal of oil and water.

Stepan Company-Millsdale Facility

Stepan manufactures polyurethane foam products used for insulation and structural rigidity in a number of common products such as picnic coolers, entry doors, water heaters and refrigerators. Over the past 5 years, the Millsdale facility has implemented a number of small and large scale pollution prevention projects and reduced its overall hazardous waste disposal per pound of finished product by

60%. The total hazardous waste generation has been reduced by 2.3 million lbs., resulting in a disposal savings of about \$1.2 million from 1992 to 1997.

Some of the efforts undertaken by Stepan include reducing hazardous air emissions by 14,000 lbs./year through installing floating roofs on two O-xylene storage tanks. In the phthalic anhydride (PA) manufacturing area, several process improvements have increased yield by 5% and reduced emissions by 4 millions lbs./year. One of the distillation waste streams from this manufacturing process now goes to a recovery vessel where additional PA is removed before the stream becomes a hazardous waste, reducing the final waste by about 40% or 400,000 lbs./year. These improvements in the PA production area have resulted in approximately \$280,000 in savings. Another manufacturing area has made a raw material substitution in the process, thus reducing the non-hazardous waste produced by 85,000 lbs. while saving \$13,000 per year.

Through process improvements including changing reactor temperatures, tighter temperature control, and installation of improved process condensers, a waste stream was reduced by 80% resulting in savings due to increased yield, improved raw material usage, and less disposal. The facility also runs a comprehensive recycling program for pallets, plastic fiber drums, steel drums, and office materials.

Community Group

Safer Pest Control Project & Henry Horner Residents Committee

In the fall of 1996, a new pest control program was initiated at the Henry Horner homes, a large public housing development on the near west side of Chicago. Before the program, rodent problems and cockroach infestations had been a problem for decades, which had resulted in widespread misuse of insecticides. The Safer Pest Control Project (SPCP) is a grassroots, community-based program designed to help residents control pests effectively while minimizing the use of toxic chemicals by substituting a combination of non-toxic and less-toxic practices and products. The program had three major components: building repairs and improved sanitation; resident education; and minimal use of less toxic and invasive pesticides.

A team of trained and paid Horner residents were taught how to caulk and seal cracks around the plumbing and heating pipes in Horner's occupied and unoccupied buildings, blocking pests' entry points and reducing the availability of water,

food, and hiding places. Building management also assisted by steam cleaning trash chutes and fixing some of the plumbing problems that led to flooding in the buildings. A 17-year-old Horner resident helped create a comic book showing residents that proper cleaning techniques would help eliminate pests. Workshops were held to instruct residents in the use of free "tool kits" containing home repair items so that they could maintain their apartments. Finally, gel baits instead of broadcast spray pesticides were used to reduce the probability of human contamination. After the program had been in effect, residents reported significant declines in both cockroach and rodent problems and also a reduction of private pesticide use by residents as well.

The first two components of SPCP contributed to a marked reduction of non-volatile insecticidal gel baits consisting primarily of Max Force Gel (active ingredient, hydramethylnon), which is generally considered to be less toxic than most insecticides on the market. Four pest control visits took place over the year and each time they applied progressively smaller amounts of bait, averaging 58, 40, 13 and finally just 10 grams per unit. Reducing both the volume and the toxicity of pesticide is also effectively reducing the waste generated.



Certificate Winners



Large Industry Category (more than 500 employees)

Abbott Laboratories

Abbott Laboratories operates a combination of six coal and natural gas fired steam boilers to provide steam and heat energy to its manufacturing and facility operations at its North Chicago facility. The feedwater to run these systems consisted of 65% returned condensate and 35% makeup water from Lake Michigan. The company replaced the existing water pretreatment system to meet goals of environmental improvement, as well as cost and operations savings. The project included the purchase and installation of clarification equipment coupled with reverse osmosis units to produce higher quality water for boiler makeup. The reverse osmosis technology removes approximately 98% of the dissolved solids from the Lake Michigan water supply. This decreased the chemical treatment costs needed to remove damaging carbonates and reduced costly and wasteful blow down rates. Process changes also use less steam in the overall boiler feedwater production than the previous process, providing additional cost savings. This project required \$2.5 million to implement and saves approximately \$522,825 annually with one time savings of \$179,000. Waste volume and toxicity reductions came from the following areas: boiler blowdown volume (15 million gallons per year) that previously went to the storm drain containing significant heat energy; softener and filter discharges containing heat energy and reacted lime slurry are avoided at a rate of 21 MM gallons per year; lime slurry discharged to the plant waste treatment plan is avoided at 8 MM gallons per year; and, the elimination of the hot lime system avoids the annual use of 85,500 lbs. of lime.

Caterpillar Inc.—Peoria

The Peoria facility of Caterpillar began two pollution prevention projects in the past year. A team was formed within the Technical Services Division (TSD) with the goal of decreasing the volume of wood waste that is generated at the facility by developing programs to reduce, reuse, and recycle these wastes. The four programs developed were: returning reusable pallets, selling wood to employees for home and hobby use, reusing plywood separator sheets in the Technical Center shop

areas, and utilizing Victory Acres (a local charitable organization assisting recovering drug and alcohol dependent persons) to chip waste wood into landscape mulch, which is then used at the facility. As a result of these programs, the facility expects to recycle more than 2,000 cubic yards of wood, the equivalent of more than 50 trailer loads. Cost savings have been projected at more than \$90,000 annually and result from avoiding transportation and landfill fees, not buying expensive and short-lived landscaping mulch, and by reuse of pallets and wooden separators rather than purchasing new.

A second team-based project undertaken at Caterpillar's TSD involved non-reusable pressurized containers. An approval procedure for use was begun that places responsibility on the line organization and has minimized the use of aerosol cans, decreased employee exposure and improved storage practices. TSD utilized new techniques for recycling aerosol cans, propane, calibration gas and starting fluid cylinders. Hazardous waste was reduced, annual hazardous waste disposal costs of over \$75,000 per year are being avoided and recycling of the scrap steel reduces pollution. Compliance with environmental regulations has been maintained and liability for wastes reduced.

Honeywell MICRO SWITCH Division—Plant 4

MICRO SWITCH is the world's leading manufacturer of switches, sensors and related control system solutions. The manufacturing processes in seven Illinois locations include metal working, plastic molding, electroplating, stamping, welding, assembly and product testing. The Plant 4 facility in Freeport, manufactures sensors, switches, and control products and includes electroplating operations. Efforts undertaken by this facility in the last year targeted hazardous material use, wastewater flow from processes, and the resulting hazardous waste—metal hydroxide sludge. Wastewater flows have been reduced 45% (over 5 million gallons), hazardous waste for on-site treatment was reduced 30% (over 1 million gallons), and hazardous waste sludge has decreased by 8% over the past two years despite increases in production and treatment efficiencies. Some of the opportunities identified to reduce wastewater flow and ultimately, chemical use, include counter-flowing rinses, flow restricters, timers, and water recycling stations throughout the operations. The company hopes to close-loop the plating operations in the next few years.

Medium Industry Category (151 - 500 employees)

Eagle Wings Industries, Inc.

Eagle Wings Industries supplies high quality steel stampings and weldments to the automotive industry. The project undertaken by the company during the last year focused on a change in procedure of cleaning and de-scaling the rinse and phosphating tanks on the paint line. This was an employee initiated project through the facility's "Kaizen" or continuous improvement small group activities. The changes involved re-plumbing the valves to allow transfer of fluids in both directions between the phosphating and rinse tanks, eliminating the need to neutralize and treat phosphating chemical. This change eliminated 7,340 pounds of chemical and 12,666 gallons of water from the waste stream annually. It also shortened the amount of time needed to perform a de-scale operation. Annual cost savings to date are approximately \$4,090.

Small Industry Category (less than 100 employees)

BF Goodrich Specialty Chemicals

The BF Goodrich chemical facility produces antioxidant and accelerator chemicals for the rubber industry. It operates a wastewater treatment plant that also treats wastewater from the Geon Company, a neighboring facility.

BF Goodrich has implemented three major pollution prevention activities that have significantly reduced hazardous waste generation, improved process efficiency and reduced disposal costs. The first involves an improved method of removing polyvinyl chloride (PVC) product solids from wastewater. By installing a new filtering system, which cost approximately \$60,000, residual PVC product solids are now collected, reclaimed and sold as low-grade product, netting approximately \$3,000 per year. Additionally, the hazardous waste disposal of sludge, which in 1993 cost the facility \$273,000, was reduced to zero in 1996.

The second project substituted low-grade 92% methanol for the ethanol food supplement used in the biological waste treatment reactors. Previously, when using ethanol, the production process produced an ignitable, hazardous waste. The methanol is a by-product produced by one of the BF Goodrich processes and so the waste treatment facility no longer has to pay for ethanol used or pay for blending the hazardous waste. This project resulted in a two-fold economic savings of approximately \$60,000. Finally, Goodrich was able to rework an off-specification product thereby reducing the caustic waste from 15 drums to none.

Continuous Improvement Category

Argonne National Laboratory

Argonne National Laboratory is a multi-program laboratory operated by the University of Chicago for the U.S. Department of Energy (DOE). The lab's mission is basic research and technology development to meet national goals in energy technology, environmental quality, scientific leadership, and educational infrastructure. Through the performance of these activities, Argonne generates a number of waste streams.

Argonne's established waste minimization and pollution prevention (WM&P2) program consists of a Strategic WM&P2 Plan, a three-year P2 Program Plan, an annual WM&P2 Implementation Plan, and a Current Year Work Plan. Funding and resources to carry out these activities are provided by DOE and Argonne management.

DOE and Argonne specifically identified waste streams that were to be substantially reduced by December 31, 1999, using calendar year 1993 as a baseline. These goals are: reduce by 50% the generation of radioactive waste; reduce by 50% the generation of radioactive mixed waste; reduce by 50% the generation of hazardous waste; reduce by 33% the generation of routine sanitary waste; and, recycle 33% of sanitary waste from all operations, including cleanup and stabilization activities.

Many activities are underway at Argonne to attain these goals, a few of which are listed here.

—a program to recycle fly ash generated at the coal burning boiler house resulting in the diversion of 1,000 tons of fly ash from the waste stream and saving \$40,000 to \$70,000 a year in disposal costs.

—began selling coal fines from coal burning activities generated revenues of \$31,700 and avoiding the management and disposal of this special waste which saved \$67,300.

—scrap metal recycling program recycled 254,920 pounds of metal, resulting in revenues and cost avoidance of over \$60,000.

Motorola IL02 Facility

The Motorola IL02 facility houses several different divisions and research groups for Motorola Land Mobile Products Sector. A repeat winner of the Governor's Awards, this year's effort by Motorola again shows the company's commitment to

continued pollution prevention activities. With a five year, 10-fold landfill reduction goal, the facility's landfill waste reduction team worked closely with waste haulers and recycling companies. General trash was analyzed regularly and opportunities for reduction identified. Even though the factory increased production and output by 70%, landfill waste was reduced by 30%. The generation of process waste decreased by 34% through the elimination of waste flux from the manufacture of circuit boards, resulting in a savings of \$41,000.

Motorola has also incorporated pollution prevention aspects into the design phase of its products. Through its Design for the Environment focus group, an environmental scoring software system is used to evaluate the environmental performance of product designs based on the limited information available during the design phase. Eight criteria are measured: energy, mass, recycled material content, recyclability, number of materials, toxicity, disassembly time and end-of-life value. This allows design engineers to determine if Design A is more environmentally friendly than Design B.

United States Naval Hospital

The U.S. Naval Hospital is a tenant command of the U.S. Naval Training Center, Great Lakes. Since 1991, the hospital made it a policy to collect and eliminate the use of mercury containing equipment such as thermometers and sphygmomanometers, with total elimination achieved in 1995. A cooperative mercury reduction program with personnel from the Naval Dental Research Institute has resulted in a system that reduces the amount of mercury (from dental amalgam) entering the sanitary sewer system. A separator unit uses a filter press that separates the mercury from the water. Analysis has shown that mercury content was reduced from 11-51 ppb to non-detectable 2 ppb after system installation. Other pollution prevention activities include a material substitution in the laboratory from xylene to clearene, a less toxic, non-carcinogenic solvent used in preparation of tissue slides. A solvent recycling system was installed in the laboratory, reducing the monthly amount of generated hazardous waste from 25 gallons to 7.5 gallons, and the amount of raw solvent purchased each month by 58 gallons. The hospital is also using a purchasing method and inventory system that allows better tracking and use of materials and reduces the possibility of material waste due to expired shelf-life.

W.H. Maze Company

W.H. Maze manufactures nails from hot-rolled steel rod. The company implemented several pollution prevention practices of significant benefit to the company

as well as the environment. Part of the nail-making process is removing scale from the steel prior to drawing the rod to the appropriate diameter. With the installation of a refrigeration-type acid recovery system W.H. Maze can now generate and recover ferrous sulfate crystal (salt) from their sulfuric acid pickle solution. The salt is sold as a bulk-shipment commodity for use in a wide range of applications and products while the remaining liquid is returned to the pickling process for reuse. This process eliminated hauling and disposal of 140,000 gallons of hazardous waste acid solution and saves the company \$20,000 per year. The wastewater pretreatment process using metal-hydroxide precipitation chemistry was upgraded to a two-step precipitation process. The goal was to provide byproducts that were usable in other markets. The iron is now precipitated and returned to the pickling/acid recovery process. The resulting filtrate is further processed to yield a low-iron, zinc hydroxide filter cake. The company also began reusing hardwood sawdust used to clean nails in a tumbling process. Through multiple-reuse and then using a furnace to burn the spent material, thereby recovering combustion heat, consumption was reduced by two-thirds, saving \$10,000 per year. Other activities at W.H. Maze include the ability to recycle oil for reuse by careful segregation of waste fluids.

Educational Institution

Illinois State University/University of Illinois Livestock and Urban Waste Recycling Research Team

The goal of this cooperative effort was to find viable solutions for creating value added by-products from livestock and urban waste streams. The research team was composed of six investigators representing diverse disciplines from the two institutions. They focused on a variety of different outreach efforts including: controlling odor produced by livestock facilities; developing pathogen free, nutrient dense livestock feed from human food waste; developing a livestock feed from grass clippings through ensiling; developing compost from combinations of solid and liquid livestock manure and landscape waste; and processing liquid swine manure to produce a palatable livestock feed and an environmentally friendly and acceptable effluent.

Prior to the initiation of this research project, the ISU Office of Residential Life disposed of more than one ton of garbage in the local landfill on a daily basis. Now all the food waste produced from the campus dining centers is diverted to the ISU Farm where it is converted into a flaked, pathogen-free livestock feed. As a result of this project all of the town of Normal's leaves and grass clippings—more than 40,000 cubic yards annually—are now diverted to the ISU Farm for composting.

Also, all livestock manure from the ISU Farms, 4,000 wet tons annually, is now diverted to compost production.

Southern Illinois University—Edwardsville and Carbondale

The Department of Environmental Health and Safety (EHS) manages hazardous materials, coordinates recycling in academic and administrative areas, and monitors compliance with OSHA and EPA regulations at the Carbondale and Edwardsville campuses of Southern Illinois University. The chemical exchange program, initiated in 1992, provides a method to direct surplus chemicals away from disposal and toward a productive end use by redistributing them to other areas of the university and other schools, as well as to outside governmental agencies. Since the program began more than 700 containers representing 1,400 pounds of chemicals have been diverted from the waste stream. The cost savings to the university has been approximately \$102,000; external organizations also have saved money by purchasing the chemicals at a lower cost.

The chemical purchase review program reduces the production of highly reactive and/or highly toxic wastes by restricting the purchase of these chemicals. Also, whenever possible, less hazardous alternative chemicals are substituted. Campus recycling is also an important part of the P2 program at both campuses. Since 1992, more than 550 tons of material have been recycled by the EHS programs.

Vendor Category

Nalco Chemical Company

Nalco Chemical Company is the largest provider of water treatment and process chemicals, services and systems in the world. The company has developed a new liquid form of dispersion polymer, ULTIMER, for removing suspended solids, organic matter and other materials from water prior to use in industrial processes. These liquid polymers are manufactured through a unique dispersion polymerization process that uses a water-based salt solution as a reaction medium instead of oils and surfactants. The new products contain almost zero volatile organic compounds, reducing air releases significantly. The product also eliminated the environmental and health hazards associated with the respective emulsion and dry polymer forms. By having water as the reaction medium for ULTIMER products, rather than conventional oil and surfactant mixtures, toxicity, flammability, and transportation hazards of the widely-used emulsion forms are eliminated.

WMRC's Pollution Prevention Services

The Illinois Waste Management and Research Center, a non-regulatory agency, can help your company meet its pollution prevention or waste management needs in a number of ways. Answering questions via telephone, conducting on-site visits and evaluations, in-depth assessments as requested, and assistance with technology modifications through research in our engineering laboratories are among the services available from WMRC. Staff engineers have industrial experience and are able to apply their real world knowledge to assist with overcoming problems in implementing pollution prevention programs, plans, or projects.

Pollution Prevention Program Development Assistance

- ◆ On-site presentations on methods to develop a pollution prevention program and increase staff awareness
- ◆ In-depth assessment to aid facility staff in identifying pollution prevention opportunities
- ◆ Work with facility management or staff to develop an action plan for incorporating pollution prevention into the company's way of doing business
- ◆ Train facility staff in pollution prevention concepts and techniques
- ◆ Provide case study examples from our databases and extensive library
- ◆ Provide guidance manuals, reports, and factsheets on pollution prevention

Alternative Cleaners Evaluation Program

Manufacturing processes in many Illinois factories often include product cleaning steps. With restrictions on organic solvent use mandated by the Clean Air Act Amendments of 1990 and the targeting of 17 priority chemicals by USEPA's 33/50 voluntary reduction program, manufacturers are examining alternative cleaners. WMRC investigates techniques designed to reduce or eliminate the use of hazardous solvents and offers businesses a detailed, unbiased examination of available cleaning alternatives.

Center staff have designed an efficient portable system to test a variety of cleaning products under a broad range of conditions. The goal of this program is to help businesses in Illinois comply with new regulations by identifying less toxic cleaning alternatives, assisting with process modifications to reduce wastes, and helping incorporate waste minimization and pollution prevention into all aspects of daily business operations.

Process Efficiency Research and Development Assistance

- ◆ Evaluate equipment or techniques for specific processes. Projects can be conducted in WMRC's pilot lab or on-site using equipment available from the Center. Additionally, WMRC maintains agreements with equipment suppliers so that many other equipment alternatives can be tested on a trial basis.
- ◆ Evaluate materials and materials substitutions used in a specific process and their consequent effects on waste generation.
- ◆ Provide technical information to a company in order for them to evaluate modifying their waste generating processes in-house vs. using a vendor.

Chemical Process Laboratory

Waste handling costs can outweigh the benefits of simply maximizing product conversion when hazardous materials and traditional manufacturing chemistries are employed. A major focus of this laboratory is to modify chemical parameters to give the proper balance of yield and by-product formation. Often this requires the design of new "environmentally benign" processes. Significant waste reductions can also be obtained by recovering marketable by-products from existing process waste streams. This laboratory attempts to develop cost effective technologies at both ends of the manufacturing spectrum.



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