

ENVIRONMENTAL SYNOPSIS

The Chairman's Corner

Rep. Scott E. Hutchinson, Chairman



The question of what to do with electronic waste is one that is facing Pennsylvania and our entire nation. The issue itself is not new, but the volume of e-waste headed for the scrap heap, unless recycled or reused, is growing ever larger. According to the Environmental Protection Agency (EPA), electronic waste is the fastest growing category of the municipal solid waste stream.

Nationally it is estimated that 2 million tons of electronic scrap is generated annually. The Consumer Electronics Association estimated that in 2005, about 304 million electronic items, of which about two-thirds were still in working order, were removed from U. S. households. The EPA reported that in 2005, between 1.5 million and 1.9 million tons of discarded electronic waste were landfilled while only about 345,000 – 379,000 tons were recycled.

The Joint Legislative Air and Water Pollution Control and Conservation Committee (Committee) has taken up the issue of what to do with electronic waste because of numbers like those above. In October, the Committee held a public hearing concerning e-waste recycling and heard about several different approaches. Thus far, there is no national standard, and different states are trying different methods to recycle items like computers, TVs, VCRs, cellphones and monitors.

Pennsylvania is no exception. Several different approaches have been or will be introduced here, and they do not share the same approach to the problem. Decisions will have to be made sooner or later as to what Pennsylvania will do with the e-waste generated here.

The Committee recently hosted an e-waste simulation exercise...For photos, see "Committee Chronicles" on page seven

To learn more about existing models that are in place around the nation and to see how they might work (or not work) in Pennsylvania, the Committee recently hosted an e-waste simulation exercise. It was a hands-on exercise in which the more than 20 individuals in attendance assumed the roles of various players in the recycling chain and had to carry out their duties as prescribed by the recycling system in which they were operating. Besides myself, attendees included Committee and other legislative staff, staff from the Department of Environmental Protection (DEP) and EPA, representatives of electronics firms and groups that work with them, and members of several interested associations such as the Professional

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NOTES FROM THE DIRECTOR

CRAIG D. BROOKS, EXECUTIVE DIRECTOR

The Environmental Protection Agency (EPA) estimates that wastewater utilities will need \$202.5 billion in the next 20 years to replace, rehabilitate, expand or upgrade collection and treatment systems, according to the 14th Clean Watersheds Needs Survey released in January 2008. The EPA survey is based on projects identified by wastewater utilities as vital to meeting water quality standards. The \$202.5 billion figure is based on needs that existed as of January 1, 2004.

The estimate includes \$134.4 billion for wastewater treatment and collection systems, \$54.8 billion for combined sewer overflow corrections and \$9 billion for stormwater management. In addition, the estimate includes \$4.3 billion to build systems to distribute recycled water. The estimate represents the capital investment necessary to meet the nation's wastewater treatment and collection system needs, as well as its municipal stormwater management program and recycled water distribution needs.

The purpose of the survey is to help state lawmakers make informed decisions about pollution control measures necessary to meet environmental health objectives of the Clean Water Act and also to help create financial incentive programs to fund the wastewater and sewage needs.

Under the Clean Water Act, every four years EPA is required to report to Congress the estimated costs of infrastructure and the projects needed to meet clean water objectives. EPA's last survey covered needs up to 2000. The survey for those needs was released in 2003. In that survey, EPA estimated that \$181 billion would be needed to collect and treat wastewater, reduce sewer overflows, manage stormwater and control non-point source pollution. In constant 2004 dollars, the latest estimate represents an increase of \$16.1 billion from the last survey. The survey suggests that the increase is due to a continuously aging infrastructure, increasing population and increasing water quality demands by the federal government.

According to the National Association of Clean Water Agencies (NACWA), which represents about 300 publically owned wastewater treatment facilities, the survey confirms that the needs continue to increase while the funding continues to decrease. Because the needs are based on 2002 and 2003 information, NACWA suggests it's only fair to assume that the needs have increased since that time.

The findings are based on a comprehensive census survey of more than 30,000 water quality programs and projects in 49 states, the District of Columbia and Puerto Rico. Alaska did not participate in the survey.

The projects are mostly eligible for funds under the Clean Water State Revolving Loan Fund (SRF) program. Under the SRF program, which was established in 1987, EPA makes capitalization grants to the states which in turn make low-interest loans to wastewater utilities. States are required to match the funds they use by at least 20 percent, which are intended to be repaid

into the fund, making it self-perpetuating.

The SRF budget for fiscal year 2008 is \$689 million, nearly unchanged from the estimated amount available in 2007, but far less than the \$831 million provided in 2006. Although EPA is committed to promoting full cost pricing for water, the agency has suggested that the SRF was never intended to foot the entire bill for replacing or repairing wastewater utilities.

According to the survey, EPA has found that the greatest need lies in upgrading, expanding, rehabilitating and replacing wastewater treatment and collection systems, followed by efforts to curb overflows from wastewater and stormwater.

Unlike the last survey, the latest needs estimate does not include the \$38 billion for non-point source controls, but it does include a need of \$4.3 billion to build systems to distribute recycled water which is considered by many to be the "wave of the future".

EPA's "Clean Watersheds Needs Survey 2004 Report To Congress", is available at <http://www.epa.gov/cwns/2004rtc/cwns2004rtc.pdf>.

**The amount needed to replace, rehab,
expand or upgrade wastewater collection
and treatment systems?
\$202.5 billion in the next 20 years**

RESEARCH BRIEFS

Each month, the committee's staff researches and prepares a number of "briefs" on several topics relevant to the Joint Conservation Committee's mission. Very often, these briefs include references to reports and further research on the topics so that readers may pursue issues on their own.

Report Finds Airborne Toxins in National Parks

—Tony M. Guerrieri, Research Analyst

Are the fish caught in remote, pristine lakes in U.S. national parks safe to eat? According to a report by the U.S. National Park Service (NPS), some fish from secluded lakes in national parks across the West and Alaska contain such elevated levels of heavy metals and agricultural pesticides that they are unsafe for human consumption.

The NPS report, *"The Fate, Transport, and Ecological Impacts of Airborne Contaminants in Western National Parks"*, evaluates the risk to ecosystems and food webs in western national parks from long-range transport of airborne contaminants. The report also examines the likely sources of these contaminants. The six-year, multi-agency report found that numerous contaminants, including industrial chemicals and both current and past North American pesticides, have been turning up at sometimes dangerously high levels in ecosystems in eight core parks and 12 other park units.

The report examines some of the most remote places in the United States, from Denali in Alaska and Glacier in Montana, to Big Bend in Texas and Yosemite in California. Key findings from the report indicate that out of more than 100 contaminants tested, 70 were found at detectable levels in snow, water, vegetation, lake sediment and fish. While concentrations of most of these contaminants were below levels of concern, others appear to be accumulating in sensitive resources such as fish. For some contaminants, high concentrations in fish have exceeded fish-eating wildlife and/or human health consumption thresholds in many of the eight core parks that were the primary focus of the study.

The substances detected ranged from mercury produced by power plants and industrial chemicals such as PCBs, to the banned insecticides dieldrin (banned from use in the U.S. since 1987) and DDT (among the most widely used agricultural pesticides before it was banned in 1972). These can cause health problems in humans including nervous system damage and dampened immune system responses, and can affect fertility.

Contaminants that accumulated in fish exceeded human consumption thresholds at all of the eight core parks: Sequoia-Kings Canyon in California, Mount Rainier and Olympic national parks in Washington state, Glacier in Montana, Rocky Mountain in Colorado, plus Gates of the Arctic and Denali national parks and Noatak National Preserve, all in Alaska.

The report found that numerous contaminants have been turning up at sometimes dangerously high levels in the ecosystems of eight core parks and 12 other park units

Average mercury concentrations in fish from Alaska's Noatak National Preserve were above the federal human health threshold for consumption (adults eating 2.3 meals of these fish per month), while mercury concentrations in some fish exceeded the threshold at Gates of the Arctic, Olympic, Mount Rainier, and Sequoia-Kings Canyon. Dieldrin concentrations in fish from Rocky Mountain, Sequoia-Kings Canyon, and Glacier exceeded the health threshold for recreational fisherman. Dieldrin concentrations also exceeded health thresholds for subsistence fish consumption (adults eating 19 meals of these fish per month) at all national parks, except Olympic. Average DDT concentrations in fish exceeded the human risk threshold for subsistence fishermen at Sequoia-Kings Canyon and in Oldman Lake at Glacier National Park.

Concentrations of contaminants in fish were also compared to health thresholds for fish-eating wildlife. Mercury concentrations in fish at all eight parks exceeded health thresholds suggested for birds, and were above mammal health thresholds at some parks. DDT concentrations in fish exceeded the fish-eating bird health threshold in Glacier and Sequoia-Kings Canyon national parks.

Concentrations of current-use pesticides and other compounds, such as the commonly used flame-retardant, PBDE, were detected at Rocky Mountain and

Mount Rainier, but concentrations in fish did not exceed human or wildlife health consumption thresholds.

According to the report, evidence suggests that the contaminants are carried in air masses from sources as far away as Europe and Asia, as well as nearby or regional sources. For example, concentrations of pesticides were highest in parks closest to agricultural areas. In Alaska parks, with little nearby agriculture in the region, there are very low concentrations of most current-use compounds. However, concentrations of historic-use chemicals in Alaska systems are similar to those in other parks sampled, suggesting greater influence from global atmospheric transport.

Agencies that participated with the NPS on the study were the U.S. Environmental Protection Agency, the U.S. Geological Survey, the U.S. Forest Service, Oregon State University and the University of Washington. The 500-page report, *"The Fate, Transport, and Ecological Impacts of Airborne Contaminants in Western National Parks"*, is available at http://www.nature.nps.gov/air/studies/air_toxics/docs/2008FinalReport/WACAP_Report_Volume_I_Main.pdf

Cellulosic Ethanol Production Does Not Account for Soil Health

– Craig D. Brooks, Executive Director

Current estimates might overstate the ability of the U.S. ethanol industry to use crop residues for cellulosic ethanol production because some crop residues must be left on the ground to preserve soil health, according to a recent study by the U.S. Department of Agriculture (USDA). As a result, the USDA said that more research is needed regarding how much cellulosic ethanol can actually be produced in a sustainable manner. The study also called for the government to develop sound guidelines for harvesting biomass in ways that do not harm the soil.

The research for the study was conducted by the USDA Agricultural Research Service in cooperation with the National Soil Survey Center. According to the study, a crop residue called corn stover is widely considered to be a potential primary source of feedstock for cellulosic ethanol. However, corn stover is also critical for replenishing soil organic matter that retains and recycles nutrients, improves soil structure, enhances water exchange and aeration and sustains microbial life. The research suggests that the quickest way to reduce the productivity of the soil is to reduce its organic matter.

The study found that most estimates of the amount of the crop residue that can be harvested for biofuels rather than left on the ground only accounts for the need to control soil erosion, while ignoring the equally important need to maintain soil organic matter. The research was conducted in 10 counties and in nine of the top 11 corn-producing states. It found that the amount of stover needed to replenish soil organic matter actually was greater than the amount required to control soil erosion from water and wind.

More corn stover must remain on the ground to maintain soil quality, meaning more biomass must come from other sources

In short, we have underestimated the amount of corn stover that should remain on the ground rather than be used for energy. In turn, more biomass must come from other sources such as switchgrass or municipal waste to maintain both soil quality and current projected levels of cellulosic ethanol production.

Because the preservation of soil organic matter has received relatively little attention, the study suggests that more research is needed before it can be determined exactly how much corn stover can be used for cellulosic ethanol. The study calls for research into multiple feedstocks that can generate truly sustainable biomass feedstock production and harvest guidelines.

The study also calls for an extensive effort to expand development of existing crops, to develop new crops and to deploy advanced cropping systems so that biomass production can be expanded to provide a sustainable supply of cellulosic feedstock without reducing soil organic matter.

According to the study, the significance of this challenge cannot be overstated considering the speed with which the energy industry is pursuing cellulosic-based fuels. A study of this magnitude and importance may not be achievable until 2017, the study says, so the study calls upon the U. S. Environmental Protection Agency to promote the responsible development of biofuels and cellulosic ethanol.

The study *"Corn Stover to Sustain Soil Organic Carbon Further Constrains Biomass Supply"*, is available at <http://agron.sciijournals.org/cgi/content/full/99/6/1665>.

Climate Change: The Cost of Inaction

– Tony M. Guerrieri, Research Analyst

Significant changes in climate are already visible in the United States, and are expected to become more pronounced in the future. These will lead to wide ranging impacts on the natural and man-made environment across different sectors and regions of the United States, which in turn will lead to economic costs. A report by the University of Maryland's Center for Integrative Environmental Research (CIER) examines the economic costs of climate change at a sector level in the U. S., considering water supply, agriculture, coastal impacts, energy, human health, forest fires and insurance claims.

While detailed information is still limited, the CIER report, "*The U.S. Economic Impacts of Climate Change and the Costs of Inaction*", reveals that projected changes in climate are expected to have wide ranging impacts and economic effects. Inaction in responding to the challenges of climate change in the U. S., according to the report, will cost billions of dollars in weather-related damages in coming years.

The report warns that the costs of not acting on climate change on U.S. infrastructure and its agriculture, manufacturing and public service sectors, will far outweigh the costs involved in making the needed reductions in greenhouse gases.

While much of the public debate has focused on the upfront costs of emission controls, there has been only limited research on subsequent expenses, such as rebuilding or preparing infrastructure to meet new realities and the ripple economic effects on the agricultural, manufacturing and public service sectors. In part, the report evaluates the "costs of inaction" – how failure to reduce greenhouse gases can make response and adaptation more expensive.

The report presents an overview of climate impacts on various economic sectors for specific geographic regions (Northeast and Mid-Atlantic, Southeast, Midwest, the Great Plains, West, Pacific Northwest, Alaska, Hawaii and U.S. affiliated islands).

The Northeast and Mid-Atlantic region's (Maryland, West Virginia, Pennsylvania, New York, Delaware and New England) extensive coastal infrastructure (including transportation and energy supply networks and coastal developments) will likely endure the greatest total economic impact from climate change. The estimated value of insured properties vulnerable to hurricanes was nearly \$4 trillion in 2004. A Category 4 hurricane touching down in a major metropolitan area would cost between

\$50 billion to \$66 billion in insurance losses alone. A sea level rise of 20 inches would cause anywhere from \$8 billion to \$58 billion in losses.

Transportation infrastructure in the region is especially vulnerable to storm surges. In the New York metropolitan area alone, there are 48 major transit facilities at 10 feet or less above sea level – including the city's airports. Damage to this transit infrastructure caused by the September 11th attacks amounted to over \$7 billion. Similarly, flooding of the Boston subway system in 1996 inflicted more than \$92 million in damages. Approximately 7,439 miles of urban roads in the Northeast and Mid-Atlantic region are potentially at risk.

Constructing sea wall and bulkhead protection for just 25 percent of the length of the region's coastline would cost from roughly \$300 million to just under \$8 billion. Constructing dikes or levees to protect against a one-meter rise in sea level would run from \$300 million to just over \$1.5 billion for a quarter of the coastline. Evacuation effort estimates for the Northeastern coastal regions ranges from nearly \$2 billion to more than \$6.5 billion.

The report warns that the costs of not acting on climate change will far outweigh the costs in making the needed reductions in greenhouse gases

Storm damage is just one factor in what could be a cascade of costs amounting to hundreds of billions of dollars, the report documents. Other impacts include changes in water quality and water temperature on the coasts which may negatively affect the \$63 billion ocean economy sector, which employs 1.1 million people. A decrease of between 10 percent and 20 percent in skiing days will result in a loss of between \$405 million and \$810 million per year. Other tourism industries, such as snowmobiling and beach-related sectors, are likely to experience declines, as well.

The forest industry is estimated to face declines in productivity of as high as 17 percent. Maple syrup production may also suffer, with sap flow predicted to fall by between 17 percent and 39 percent. That would be a loss of between \$5.3 million and \$12.1 million in annual revenue to this \$31 million industry.

Effects on agricultural crops are expected to be mixed, causing losses for some crops and gains for others. Losses are expected to be significant. New York's agricultural yield may be reduced by as much as 40 percent, causing \$1.2 billion in annual damages. The threat of drought is expected to rise, also affecting the

agricultural sector. For example, a 1999 nationwide drought cost the Northeast region around \$973 million in net farm income losses.

The report concludes that the economic impacts of climate change will occur throughout the country, and while those impacts will be unevenly spread and some positive effects will be enjoyed, negative climate impacts will outweigh benefits for most sectors that provide essential goods and services to society.

The University of Maryland's CIER report, "*The U.S. Economic Impacts of Climate Change and the Cost of Inaction*", is available online at <http://www.cier.umd.edu/climateadaptation/index.html>.

Acid Rain Emissions Reduced

– Craig D. Brooks, Executive Director

Sulfur dioxide (SO₂) and nitrogen oxide (NO_x) emissions are the key pollutants in the formation of acid rain. According to an Environmental Protection Agency report, these emissions fell sharply in 2006 due to reduced energy demands and early compliance with the Clean Air Interstate Rule (CAIR) and the Acid Rain Program (ARP). The ARP, established under Title IV of the 1990 Clean Air Act Amendments, requires major reductions of SO₂ and NO_x emissions from the electric power industry.

The ARP is composed of two phases for SO₂ and NO_x. Phase I applied primarily to the largest coal-fired electric generation sources from 1995-1999 for SO₂ and 1996-1999 for NO_x. Phase II for both pollutants began in 2000. In 2006, the SO₂ Phase II requirements applied to 3,520 units, with most of the emissions produced by 1,062 coal-fired units. The Phase II NO_x requirement applied to 982 of those units that have a generation capacity of 25 megawatts or more and burned coal between 1990 and 1995.

The 2006 compliance year marked the 12th year of the ARP. During this period, the ARP has produced the following results:

- o Reduced SO₂ emissions by more than 6.3 million tons from 1990 levels or about 40 percent of total power sector emissions.
- o Electric power generation sources released 9.4 million tons of sulfur dioxide emissions in 2006, declining 830,000 tons from 2005 levels.
- o Nitrogen oxide emissions in 2006 were 3.3 million tons below 1990 levels.
- o Total SO₂ emissions fell below 10 million tons for the first time under the ARP.
- o Provided the most complete and accurate emission

- o data ever developed and made those data available through a web-based data reporting system.
- o Achieved extremely high compliance levels.
- o Reduced implementation costs by allowing sources to choose cost effective compliance strategies.
- o Estimated public health benefits from ARP emission reductions exceeded program costs by a margin of more than 40 to 1.

According to the report, after 12 years of implementation, monitoring and assessment, the ARP has proven to be an effective and efficient means of meeting emission reduction goals under the Clean Air Act. The report suggests that the program's benefits will reach \$122 billion annually by 2010, while cost estimates will be around \$3 billion annually.

The 2006 "*Acid Rain Progress Report*" is available at <http://www.epa.gov/airmarkets/progress/arp06.html>.

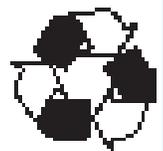


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The *Environmental Synopsis* is issued monthly.

The newsletter examines timely issues concerning environmental protection and natural resources.

If someone you know would like to receive a copy of the *Synopsis* each month, please contact the Committee office at 717-787-7570.



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ON THE HORIZON . . .

A LOOK AT UPCOMING EVENTS

- ✓ **Thursday, April 17, 10 a.m.** - Sewage Task Force meeting, Conference Room 109, Penn Stater Conference Center Hotel, 215 Innovation Boulevard, State College, PA
Please call the Committee office at (717) 787-7570 if you would like to attend.
- ✓ **Monday, May 12, 12 noon, Room 205, Matthew J. Ryan Building, Capitol complex, Harrisburg, PA** - Environmental Issues Forum featuring a presentation on the services of the Environmental Management Assistance Program provided by the PA Small Business Development Center

Environmental Issues Forums are open to the public. Please call the Committee office at (717) 787-7570 if you would like to attend.

COMMITTEE CHRONICLES . . .

REVIEW OF SOME MEMORABLE COMMITTEE EVENTS

The Joint Legislative Air and Water Pollution Control and Conservation Committee (Committee) recently sponsored an e-waste simulation exercise (details are in the "Chairman's Corner" article on page one). The simulation used role playing exercises to demonstrate how the e-waste recycling systems of Maine and California worked and how they might work in Pennsylvania.

The simulation was conducted by environmental consultant Walter Alcorn (photo at right), shown leading the discussion about the Maine system.



At left, Francis Valuzzo of Dell, Inc. (left) and Jack Himes of the PA Recycling Markets Center (center), playing their roles, discuss a problem with Alcorn before moving on to their next stop.



In the photo at right, Dan Gallo of the Environmental Protection Agency's

Region III office (left) and Committee chairman Rep. Scott Hutchinson, who are portraying recyclers at work, double check the paperwork for some discarded electronic waste brought to them to be recycled.



In the photo at left, Rep. Hutchinson (left), still in character, submits forms to "Manufacturers" for processing, as others in the simulation conduct business at their stations. Playing the roles of manufacturers are Stephanie Wissman of the PA Chamber of Business and Industry (center) and Debbie Stark of the law firm of Buchanan Ingersoll and Rooney, PC.



Recyclers of PA, the PA Small Business Development Center, the state Chamber of Business and Industry and the Consumer Electronics Association, as well as the PA Recycling Markets Center, and Lycoming County Resource Management Services.

The three-hour exercise was conducted by Mr. Walter Alcorn, a Virginia-based environmental consultant specializing in e-recycling systems and co-founder of the National Center for Electronics Recycling. He is president of Alcorn Consulting and has been working in other states and with a variety of clients in regard to electronic waste and recycling. The exercise is one that Mr. Alcorn has presented to a number of other audiences, including at least one group that was national in scope.

The focus of the workshop was on the two states that have e-waste recycling statutes in place – California and Maine. The two are very different as we learned when we took up our roles in the exercise. California has what is known as a “visible fee” system, which might also be called a point-of-sale system or one of consumer responsibility. In California, consumers pay an up-front fee to retailers when they purchase new electronics with the fee being used ultimately to help finance the recycling of electronic equipment. Maine, on the other hand, has what is known as a “producer responsibility” system. In Maine, the manufacturer is responsible for paying the collection, transportation and recycling costs for discarded covered electronics.

If you can imagine a life-sized e-recycling “board game”, that is what participants engaged in. Some of us were collectors, some recyclers and some manufacturers, retailers and administrators. Everyone also played the role of a consumer, either purchasing new electronic devices and/or discarding old ones with the appropriate individuals, which varied from state to state. We were armed with foam rubber scale replicas of PCs and TVs and poker chips to follow the money trail. There were simplified rules and paperwork that, while simpler, adhered to each state’s rules but allowed participants to work through the system in the time allotted. Depending on the participant’s stakeholder role and the state being simulated, the participant had to register with the state, weigh product on a scale, verify that e-waste is from a qualifying household, record brand data, write a paper invoice, pay or approve an invoice, or otherwise act out tasks that are part of each state’s system.

EPA Region III has set up a website to provide information about e-recycling...

Visit <http://www.epa.gov/reg3wcmd/eCycling/index.htm>

Everyone got to experience the positions of one or more stakeholders in the Maine and California systems. It provided a realistic experience of the logistical, administrative and financial aspects of both systems and clearly demonstrated as no lecture could where bottlenecks, breakdowns and other problems might exist, as well as where things worked liked clockwork. Facilitated discussions followed each simulation in which participants could discuss the pros and cons of each system and how future changes in law or product offerings might affect each of the two systems.

When the day was done, I think everyone learned something, and had fun to boot. Discussion was fruitful as each role player could describe what worked and what did not from his or her perspective of experience. I can tell you that no matter what the system may be, there is no lack of paperwork, and man-hours and the cost of same must be a consideration in whatever system Pennsylvania may ultimately adopt. To be successful, the system requires cooperation between stakeholders and understanding of each one’s responsibilities.

While Maine’s and California’s systems are up and running, other states – Washington, Minnesota and Texas come immediately to mind – are currently designing their own systems. Some are combinations of the producer and consumer responsibility models, and some are looking at new directions and raising new issues.

I’m confident the knowledge we gained from the exercise will help Pennsylvania better understand what lies before it and help to chart a sensible and effective course of action for e-waste recycling.

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