

# ENVIRONMENTAL SYNOPSIS

## The Chairman's Corner

Rep. Scott E. Hutchinson, Chairman

Good news – bad news.



As Craig Brooks points out in his "Notes from the Director" column on page two,

there is a lot of good news regarding reuse of waste tires and development of new markets for tire recycling. A South Carolina study says markets exist for more than 75 percent of the nation's tires. Pennsylvania Department of Environmental Protection (DEP) Deputy Secretary Nicholas DiPasquale told the committee at a recent public hearing that 23.5 million waste tires have been removed from known stockpiles since 1996, and pledged that DEP "...will continue to assist with market development efforts...remediate waste tire sites and...take appropriate action against waste tire pile owners."

The bad news is that in at least one market, Pennsylvania's agencies are not speaking with one voice and our Commonwealth has not maximized opportunities which have been tested in other states. Quite frankly, despite avowals of cooperation, PennDOT and DEP seem to be miles apart on the potential uses of rubber from recycled tires in asphalt paving projects. While DEP cited nationwide success stories and was enthusiastic about this market, PennDOT cited failures and seemed lukewarm to rubberized asphalt's potential.

The purpose of the committee hearing on November 24 was to receive a progress report on the use of rubberized asphalt, as well as to learn about continuing tire cleanups and other new markets for tires. Since the enactment of the Waste Tire Recycling Act in 1996, the committee has encouraged creation of new markets and innovation in tire reuse and recycling.

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A Legislative Service Agency of the Pennsylvania General Assembly

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# NOTES FROM THE DIRECTOR

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CRAIG D. BROOKS, DIRECTOR

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With more than 250 million tires discarded each year in the United States (approximately one tire per person), and that number showing no sign of declining, the search for new scrap tire markets continues. Markets exist for more than 75 percent of the nation's waste tires, according to the South Carolina 2001 Waste Tire Management Report. Some of these markets include tire-derived fuel, playground cover, jogging surfaces, soil amendments, flooring and matting, roofing shingles, road-fill applications and rubber-modified asphalt. One growing market is the use of recycled tires as an aggregate in on-site waste treatment systems. I recently read where just one manufacturer in Georgia, for instance, processes and chips more than 10 million tires per year, with approximately two-thirds of these chips used as aggregate in on-site septic systems.

There are a number of reasons that tire shreds are becoming widely accepted for use in septic systems. *First*, tire chips hold more water than stone, which makes them an excellent medium for septic systems. *Second*, they are lighter and less expensive. Tire chips are three times lighter than stone aggregate. This makes it easier to work with, often cutting installation time in half and allowing more systems to be installed per day. Freight costs are reduced because of their weight. In most cases, chips are less expensive than stone, sometimes hundreds of dollars less. It has been suggested that aggregate costs can be reduced from 10 percent to 90 percent when tire shreds are used to replace gravel. The relatively stable structure of tire chips also makes them a suitable substitute for stone aggregate. In many states, installers are awarded rebates for the use of tire chips in septic systems. *And third*, using them is good for the environment by eliminating the need to excavate natural rock and providing a needed alternative market for waste tires.

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## **Continued market development must be a key component of Pennsylvania's waste tire cleanup strategy**

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Using tire chips as an aggregate in septic systems has been approved by more than 17 states, including Pennsylvania, and many others are taking a look at doing the same. It's surprising the number of waste tires that can be used in a typical septic system. An average system of 825 square feet uses approximately 1,100 waste tires. Tire chips do not significantly compact, therefore 12 inches of chips equals 12 inches of washed gravel. Regulations require tire chips to be similar in size to stone aggregate, meaning that one ton of tire chips will provide 10 inches of aggregate for a drain field that is approximately 26 linear feet by 36 inches wide. Based on an average drain field size, several thousand new installations could result in the elimination of millions of waste tires each year. This makes using them a very good deal.

Historically, illegal disposal of waste tires created fire hazards and large breeding grounds for mosquitoes which carry the West Nile Virus. Until 1985, waste tires could be legally disposed of in landfills, but since that time, more than 38 states (including Pennsylvania) ban whole tires from landfills, 35 states allow shredded tires to be landfilled and 11 states ban all scrap tires from landfills. Currently, eight states have no landfill restrictions on the disposal of waste tires.

The Committee members recently heard from Nick DiPasquale, Deputy Secretary for the Pennsylvania Department of Environmental Protection (DEP) and were encouraged by the department's persistence in maintaining and establishing new markets for scrap tires and their collaboration with other state agencies within the Commonwealth to use and promote the reuse of waste tires. DEP has cleaned up approximately two-thirds of the Commonwealth's waste tire piles since 1996 and market development continues to be a key component of their cleanup strategy.

# 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.

## 2002 Worst Smog Season in Recent Years

— Tony M. Guerrieri, Research Analyst

Forty-one states and the District of Columbia exceeded the federal standard for ozone nearly 9,000 times during the 2002 ozone season; nearly double the number of violations of the national health standard for smog in 2001, according to a report by the U.S. Public Interest Research Group (PIRG).

Every region of the country exceeded the ozone standard more often in 2002 than 2001, according to the report, *"Danger in the Air: Unhealthy Levels of Smog in 2002"*. The report goes on to note that in the U.S. in 2002, the ozone standard was exceeded 8,818 times, compared to 4,634 in 2001.

The report did not say why the instances exceeding standards rose in 2002. However, it noted that hot weather contributes to ozone formation, and the summer of 2002 was the second hottest on record.

Ground-level ozone is formed near the ground when precursor substances such as particulate matter, nitrogen oxides, and volatile organic compounds react in the presence of sunlight. These pollutants are released via emissions from motor vehicles, power plants, industrial facilities, and chemical solvents. The ozone season generally runs from May to September as heat, sunlight, and less wind cause levels to rise.

The PIRG report compiled data from the network of 1,175 ozone monitors maintained by state and local agencies and the U.S. Environmental Protection Agency (EPA). The monitors measure compliance with the national standard for ozone of 0.08 parts per million average over an eight-hour period.

In the five years for which data are available, the frequency in which the ozone standard was exceeded has varied widely, according to the report. In 1998, the first year analyzed, 7,914 instances were recorded. In 1999, the number dropped slightly to 7,672. The frequency dropped sharply again in 2000 to 4,006 and then rose again in 2001.

From 2001 to 2002, the largest increases were in the Midwest, Southeast, and Central states, which exceeded the ozone standard 2.6, 2.8, and 5.6 times more frequently than the previous year, respectively, the report said.

The report indicated that the severity of the ozone season in a given location results from a complex set of factors, including emissions levels, the unique geography of the area, and wind and weather patterns.

Given the contributors to ozone formation, the only factor among these that can be controlled is emission levels, the report said.

California, Texas, and Tennessee led the nation with the most so-called "smog days," which is defined as those days on which at least one ozone monitor in the state exceeds the national health standard. Ozone monitors in California recorded 143 days, 62 days in Texas, and 54 days in Tennessee. Pennsylvania ranked fourth (50 days) with the most smog days.

The PIRG report includes some data on 2003 and finds that wet, mild weather this summer has reduced smog levels in many parts of the United States. For example, 20 states and the District of Columbia exceeded the national health standard for ozone 1,148 times through the end of July 2003 compared with a total of 3,961 times in those states during the entire 2002 ozone season, making for a less smoggy season overall. However, the report suggests that the nation must continue in its efforts to reduce smog levels.

The report includes a number of recommendations such as adopting fuel and emission standards for "non-road" diesel engines, which produce a disproportionate amount of pollution, including 3.7 million tons of smog-forming nitrogen oxides, or 29 percent of nitrogen oxide emissions from mobile sources.

For further information and a copy of the full PIRG report go to <http://www.uspirg.org/reports/dangerintheair2003/dangerintheair2003.pdf>.

# Nitrogen Pollution in the Chesapeake Bay

—Jason H. Gross, Research Analyst

The Chesapeake Bay Foundation recently released a report entitled *"Sewage Treatment Plants: The Chesapeake Bay Watershed's Second Largest Source of Nitrogen Pollution"*. The report studies the effects of nitrogen as it enters the Bay watershed through runoff, streams, and rivers. The report provides, for the first time, comprehensive information on how much nitrogen pollution is coming from major sewage treatment plants into the Chesapeake Bay watershed.

According to the report, scientists have known for 20 years that nitrogen pollution is the most significant problem that the Bay faces in reaching a healthy state. Higher levels of nitrogen degrade the habitat for key plants and animals that are essential to the Bay's ecosystem health and damage economically valuable crops like crabs and oysters.

Wastewater that is discharged from sewage treatment plants is the second largest source of nitrogen pollution in the Chesapeake Bay watershed. Nitrogen enters the bay from sewage treatment plants through effluent runoff, agriculture, air deposition, and urban runoff.

According to the report, there are 304 significant sewage treatment plants that discharge a significant amount of nitrogen into the watershed. These plants account for 1.5 billion gallons of wastewater treatment every day. The sum total of the plants' contribution is about 52 million pounds of nitrogen pollution annually to the Bay and its tributaries. According to the report, more than two thirds of sewage plants do not use any technologies to remove nitrogen pollution. Only ten of the 304 total plants are using currently available technologies to reduce nitrogen pollution. The treatment plants that do not provide nutrient removal have wastewater discharge concentrations of about 18 milligrams of nitrogen per liter. According to the report, if plants implemented current nutrient removal best practices the discharge concentrations could be reduced to 3 milligrams per liter, effectively reducing the collective discharge from 52 to 13 million pounds. This reduction would account for more than one third of the 110 million pounds per year nitrogen reduction goal that scientists are attempting to meet in the *Chesapeake 2000* agreement, which was implemented to reduce nitrogen loads in the Bay watershed.

The problems caused by nitrogen pollution are multifold. High nitrogen levels stimulate explosions, or blooms, in microscopic plants (algae) and act as an

algae fertilizer. Drifting algae then decreases water clarity, which blocks sunlight from underwater grasses. The grasses choke from lack of sunlight, which starves the animals that depend upon them. Without these plants the ability of the Bay to filter pollutants is also decreased. The situation is further compounded when the algae die. They sink to the bottom and create a bacterial process of decay that further chokes oxygen from the water.

The report offers state-specific information for states in the Bay watershed. In 2002 Pennsylvania's 123 significantly sized sewage treatment plants dumped a total of 11.7 million pounds of nitrogen pollution into the Chesapeake Bay. The report examined the wastewater discharge from each plant in Pennsylvania and characterized it based on its level of nitrogen pollution. According to the report, currently available technology can reduce discharge levels in Pennsylvania from the "need improvement" or "unacceptable" categories into the "excellent" or "good" categories. According to the report, 97 plants are currently unacceptable, while 13 others merely need improvement. Only 11 total plants are either good or excellent according to the report's analysis. Over 98 percent of the nitrogen pollution entering the Chesapeake Bay from Pennsylvania's sewage treatment plants comes from plants that are either unacceptable or need improvement.

According to the report, the Chesapeake Bay Foundation is continuing to take steps toward reaching the goals set in the *Chesapeake 2000* agreement. The goals are:

- ensure that each state has achieved basin-specific nitrogen reduction goals;
- ensure the passage of state and federal regulations that create enforceable levels of total nitrogen limits that do not exceed 3 milligrams per liter; and
- secure binding commitments from state, regional, and local authorities that guarantee widespread implementation of current best practices in nutrient reduction technologies for sewage treatment plants.

## News to Use in the Environmental Synopsis... share it with a friend

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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It is clear from the findings of the report that sewage treatment plants can reduce nitrogen levels significantly by using currently and widely available technology. Currently, the reduction is not occurring at a rate that will preserve future watershed and Bay health and raises the question of implementing binding regulation that will serve as the driving force for sewage treatment plant upgrades. For further information or a copy of the full report please visit [http://www.cbf.org/site/DocServer/STP\\_Report\\_final\\_1027.pdf?docID=1161](http://www.cbf.org/site/DocServer/STP_Report_final_1027.pdf?docID=1161).

## Nuclear Plants Lack Funds for Cleanup

– Tony M. Guerrieri, Research Analyst

According to a report by the U.S. General Accounting Office (GAO), in some cases, electric utilities using nuclear power plants do not appear to be collecting sufficient funds for future dismantling and cleanup of radioactive waste from the plants.

The report, *“Nuclear Regulation: NRC Needs More Effective Analysis to Ensure Accumulation of Funds to Decommission Nuclear Power Plants”*, examines the balances in decommissioning trust funds for 122 nuclear plants licensed by the Nuclear Regulatory Commission (NRC) and held wholly or in part by 99 owners, through December 2000. The report indicates that 42 of 122 nuclear plants built in the U. S. will not have enough money set aside to clean up the facilities after they are permanently shut down – potentially leaving the taxpayers responsible for billions in clean-up costs.

After a plant is closed, a significant radiation hazard exists until it is decommissioned, the report said. Decommissioning refers to dismantling plant structures and equipment and disposing of radioactive waste. To date, only three of the 125 nuclear plants constructed in the United States have been fully decommissioned, while 18 have been shut down but not fully cleaned up.

In order to pay for cleanup, nuclear power plant owners are required to pay into decommissioning trust funds over the 40-year lifetime of their plants.

The report finds that the trust funds for 42 plants, held wholly or in part by 33 owners, were smaller than the necessary benchmark to be on track for eventual cleanup. In addition, the trust funds for 31 plants held wholly or in part by 20 owners had smaller rates of contribution than necessary to be on track for eventual cleanup.

According to the report, the worst offenders are Exelon Generation Company (EGC) and the government owned Tennessee Valley Authority (TVA). The trust funds for 11 of EGC’s 20 nuclear power plants and all six of TVA’s plants are either below the benchmark or have too low a contribution rate to be fully funded at plant shut-down time. Nine other owners have insufficient trust funds for two or more of their nuclear plants, and 29 are lagging on trust funds for a single plant.

The plants with the poorest decommissioning fund status include Browns Ferry 1, 2, and 3 (Alabama); Dresden 1 (Illinois); Duane Arnold (Iowa); Indian Point 1 (New York); Peach Bottom 1 (Pennsylvania); Rancho Seco (California); and Zion 1 and 2 (Illinois). Six of these ten plants have already permanently shut down but are still awaiting full cleanup.

The NRC is required to monitor the value of decommissioning trust funds, and concluded in 2001 that all owners were on track to have enough funds for cleanup. The GAO agreed with this conclusion: the total value of all trust funds in 2000 was 47 percent higher than what was needed at that point to reach the \$33 billion estimated cost of cleaning up all U.S. nuclear plants when they retire. However, trust funds are specific to each nuclear plant, and in the case of joint ownership for a plant, each owner maintains a separate fund. The GAO found that in many cases the trust fund or funds for individual plants were insufficient despite the excess of total funds. The report also found that in the case of many plants with multiple owners, while the total funds for the plant might be sufficient, one or more owners did not have enough funds to meet their share of the cleanup cost. Decommissioning trust funds are generally not transferable between multiple owners of a single plant.

The GAO concluded that the NRC failed to identify any of these fund shortages because of two failings in its trust fund monitoring methods. First, the NRC relied too heavily on owners’ statements of future funding plans. Some owners’ fund contributions in 2001 were much less, in one case 39 percent less, than their statements on planned contributions. Second, the NRC failed to evaluate separately the multiple trust funds for joint-ownership plants, effectively assuming that owners with excess funds would balance those with insufficient funds, even though funds are generally not transferable between owners. Finally, the GAO report also found that the NRC has not established specific criteria for responding to insufficient trust funds.

The report concludes that without a more effective method for evaluating owners’ decommissioning trust funds, and without criteria for responding to any unacceptable levels of financial assurance, the NRC will not

be able to effectively ensure that sufficient funds will be available when needed.

For more information and copies of the full report please go to [www.gao.gov/cgi-bin/getrpt?GAO-04-32](http://www.gao.gov/cgi-bin/getrpt?GAO-04-32).

## Greenhouse Gas Emissions of Personal Transportation

—Jason H. Gross, Research Analyst

The Pew Center on Global Climate Change has released a report on the transportation sector and how it relates to greenhouse gas emissions and climate change. The report, entitled *“Reducing Greenhouse Gas Emissions From U.S. Transportation”*, cites numerous opportunities that are currently available to reduce the transportation sector’s impact on climate change. Many actions that would be taken to reduce the emissions of greenhouse gasses by transportation would also help to solve other national environmental priorities such as reducing dependence on oil imports. The report evaluates potential vehicle CO<sub>2</sub> emission reduction strategies, including low-carbon alternative fuels, increased energy efficiency, increasing the operating efficiency of the transportation system, and reducing the number of trips taken.

Modern transportation systems are powered by internal combustion engines that release carbon dioxide emissions, the principal component of greenhouse gasses (GHG). The increased use of motorized transport in addition to the positive outcomes that it has resulted in have also created a steady increase in the expenditure of energy resources for transportation. According to the report, transportation is second only to electricity generation in the volume and rate of greenhouse gas emissions. Carbon dioxide accounts for 95 percent of transportation’s GHG emissions. The transportation sector accounts for over 33 percent of all CO<sub>2</sub> emissions. As the transportation sector has grown, so has its use of greenhouse gas producing petroleum.

Increasing the average energy efficiency of modern vehicles will greatly decrease the greenhouse gas emissions produced by passenger cars and light trucks. According to the report, by 2015 average efficiency can be increased by up to one third by putting into action technologies that are currently available in the marketplace. The report states that by combining proven currently existing technologies, the fuel consumption of passenger cars and light trucks can be reduced by up to 27 percent for cars and up to 42 percent for SUVs. Achieving increased energy efficiency is a gradual

process that takes place over time because of the retirement process of current vehicles with less efficient engines. Although efficiency technologies would increase the vehicles’ initial price, the cost over the life of the vehicle would be decreased due to the reduced fuel consumption.

There are means available of decreasing greenhouse gas emissions by a systems-based approach that would be effective simply by modifying our transportation behaviors. Even if current technology were fixed and alternative fuels were not available it would still be possible to greatly reduce GHG emissions without the loss of transportation accessibility by putting into practice the following:

- taking more direct routes from origins to destinations, to include techniques such as reducing aircraft idle time, using autopilot control systems on oceangoing ships and better managing airspace for more direct routing;
- increasing vehicle occupancy rates as in the cases of commuter vehicles, which can be done by legislating mandates on corporations to create incentive programs for ridesharing;
- shifting traffic from modes with high emissions such as stop and go to modes with low emission rates such as highway and nonstop traffic; and
- improving the efficiency of vehicles currently in use through better maintenance and more efficient driving behavior such as minimizing unnecessary braking, reducing speeds, and avoiding rapid acceleration.

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### **Transportation is second only to electricity generation in the volume and rate of GHG emissions**

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A successful reduction of emissions will require a policy portfolio that will involve all modes of transportation and that will include a variety of measures including: fuel economy, fiscal policies and infrastructure investments. According to the report, by combining a variety of policies, transportation-related carbon emissions could be cut by up to 25 percent by 2015 and by 50 percent by 2030. The demand for mobility for both people and goods makes it difficult to reduce GHG emissions unless vehicular efficiency is increased, alternative energy sources are developed, and road systems provide accessibility with reduced vehicular travel.

For the full report, see <http://www.pewclimate.org/document.cfm?documentID=212>.

# ON THE HORIZON . . .

A LOOK AT UPCOMING EVENTS



✓ **Tuesday, February 17, 12 noon, Hearing Room 1, Ground Floor, North Office Building, Capitol complex, Harrisburg, PA - Environmental Issues Forum.** Department of Conservation and Natural Resources (DCNR) Secretary Michael DiBerardinis will be the guest speaker. Details of his presentation to follow.

**Happy Holidays from the members and staff of the Joint Conservation Committee.**

Also, check out the committee website at <http://jcc.legis.state.pa.us> for upcoming forums as they are scheduled.

Environmental Issues Forums are open to the public. Please contact the committee office at (717) 787-7570 if you wish to attend.

# COMMITTEE CHRONICLES . . .

REVIEW OF SOME MEMORABLE COMMITTEE EVENTS

As described in *The Chairman's Corner* on page one, the committee recently conducted a public hearing on scrap tires and their use in rubberized asphalt and other applications in Pennsylvania.

Pictured here are some scenes from the hearing, which featured testimony from the PA departments of Transportation (PennDOT), Environmental Protection (DEP) and General Services (DGS).

Copies of the testimony are available by calling the committee office at 717-787-7570.



*DEP Deputy Secretary Nicholas DiPasquale testifies before the committee.*



*Committee chairman Rep. Scott Hutchinson (center) opens the hearing. He is flanked by committee executive director Craig Brooks (left) and Rep. Dave Argall (right).*

Once again the news is good in a number of areas. The 12 million “new” waste tires generated each year in Pennsylvania – roughly one tire for every state resident – are being recycled or reused, not stockpiled. Recreational uses – playground safety surfaces, athletic tracks, walking trails, horse-riding rings – are growing. DEP has provided market development funding to 15 businesses and helped others obtain loans to process crumb rubber. Civil engineering applications, such as coarse aggregate for on-lot septic systems, highway noise barriers, erosion control devices and shoreline stabilization projects are increasing and improving.

There is experimentation regarding new markets. DEP, for example, is working with Penn State University and the PA Fish and Boat Commission in evaluating the use of waste tires in artificial fish habitats. Preliminary results are encouraging. The habitats did attract fish, served as a cover to a variety of pan fish and will outlast structures made of wood.

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### **The recycling and reuse of waste tires in Pennsylvania continues to be a work in progress**

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DEP and PennDOT are also working together on a project near Kittanning that will utilize 750,000 locally collected waste tires to construct two lightweight embankments for bridge approaches. If the project works, it is hoped that use of waste tires as lightweight fill on other highway projects will increase.

The Department of General Services (DGS) noted in testimony that it already offers state contracts for tire retreading, crack and joint sealing compound and “resilient flooring products” made with recycled tires. The department has begun to add ground rubber playground material to its playground equipment contract in an effort to make it available with reliable specifications to school districts and municipalities.

The most significant area that continues to be problematic is in the use of rubberized asphalt. Despite success stories cited by DEP in other states as diverse as California, Massachusetts, Colorado and others, PennDOT’s trial efforts in Pennsylvania have been described by the department as more expensive while providing no increased benefit to normal asphalt mixtures. The committee was disturbed by PennDOT’s lack of awareness of some of these success stories and the seeming lack of a connection between DEP and PennDOT on this potential market. As a matter of fact, DEP stated that encouraging PennDOT to pursue the use of rubberized asphalt for resurfacing highways was one of its areas of major concern.

The committee shares that concern, and asked PennDOT to conduct further study and report back in 2-3 months. On behalf of the committee, I also asked the department to look into potential uses of rubberized asphalt on local roads, which receive less heavy truck travel than state highways, and on bicycle trails.

Finally, our committee will continue to work with those in the waste tire business to address other areas of burdensome state regulations in order to make this high volume, low profit margin business more financially feasible.



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