



State of Oregon
Department of
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Quality

Solid Waste Management Program Information Update for 2007-2008

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Executive Summary

Oregon Solid Waste Management 2007-2008 Update

The purpose of this report is to provide current data and other information about solid waste generation and management in Oregon and to satisfy legislative reporting requirements (ORS 459A.015 and 459A.020, the state solid waste management plan update).

This is a summary of the information contained on the DEQ Solid Waste Program's webpage at <http://www.deq.state.or.us/lq/sw/index.htm>. In order to conserve natural resources, only this executive summary is being distributed in hard copy.

This report includes data for 2006 and 2007 (the most recent data available), as well as historical trend information. The waste composition data are for 2005, and the recovery data are for 2007.

General Trends

In the report submitted in 2006, DEQ noted that the total amount of solid waste generated each year continued to increase steadily after leveling off in 2000 and 2001, with corresponding increases in recovery softening the environmental impact of the increases in waste produced. However, in 2007, both per capita and total waste generation actually decreased slightly, for the first time since DEQ started keeping these records in 1992.

- Annual waste generation per person increased from 5.7 pounds per day in 1992 to 8.5 pounds per day in 2006, then declined slightly to 8.4 pounds per day in 2007. Consequently, in 2007, Oregon met its waste prevention goal of no increase in the **per capita** generation rate for the first time.
- Total waste generation also declined slightly in 2007, from 5,728,518 tons in 2006 to 5,722,100 tons in 2007. Consequently, in 2007, Oregon also met its waste prevention goal of no increase in the **total** waste generation rate for the first time.
- In both 2006 and 2007, Oregon's recovery rate was above the state's interim goal of 45% for the year 2005, but the rate declined slightly in 2007, from 47.3% in 2006 to 46.7%. The recovery rate peaked at 49.1% in 2005. The recovery rate includes materials recycled by households and businesses or sent offsite for composting. It also includes some materials burned for energy recovery.
- The energy and greenhouse gas savings attributable to the state's successful recovery programs are significant. The estimated greenhouse gas reductions from recycling, composting, and energy recovery in

2007 are equal to 3.6 million metric tons of carbon dioxide, or the equivalent of reducing the emissions from 790,000 passenger cars (a reduction of about 5.1 percent of 2007 estimated statewide greenhouse gas emissions).

- Solid waste disposed of at Oregon municipal waste (i.e., non-hazardous) facilities, including waste from out-of-state, contaminated soil, and other special wastes, has increased from 3.6 million tons in 1994 to 6.9 million tons in 2007, an increase of 3.3 million tons or almost 92%.
- Oregon continues to receive a significant amount of waste for landfilling that is generated outside of Oregon. In 2007, more than 37% of the waste disposed of in Oregon's municipal solid waste facilities was from out-of-state.
- Oregon exports only a small fraction of its waste for disposal in other states. In 2007, only 1.4% of Oregon's municipal solid waste was landfilled out-of-state.

Waste Generation & Waste Reduction Data

This section summarizes the work that the DEQ Solid Waste Program does to gather and analyze data on waste generation, recovery rates, disposal tonnages, and waste characterization.

Waste Generation

Waste generation is defined as the sum of materials disposed and recovered. It is a rough measure of the total amount of materials discarded by households, businesses, institutions, and governments. It includes garbage as well as materials separated for recycling, energy recovery, and off-site composting.

Methods to reduce waste generation include:

- Waste prevention – Using and wasting less by acquiring fewer items as raw materials, packaging, or consumables or by purchasing more durable goods;
- Reuse – Using something again in its original form (as opposed to recycling's reformulating materials into new products);
- Composting on site so that materials do not enter the solid waste stream.

Generation of solid waste in Oregon grew between 1993 and 2006, from 3.3 million to 5.7 million tons/year. While population growth contributed to this increase, Oregonians, including individuals and businesses, produced on average 46% more discards per-capita in 2006 than in 1993. In 2007, waste generation decreased slightly. On a per-capita basis, measured solid waste generation in Oregon grew from 5.8 pounds per day in 1993 to 8.4 pounds per day in 2007, down from 8.5 pounds per day in 2006. The table below illustrates Oregon's waste generation.

Year	Generation (tons)	Per Capita Year (lbs.)	Per Capita Day (lbs.)
1993	3,255,196	2,128	5.8
1995	3,623,705	2,277	6.2
2000	4,544,280	2,645	7.2
2001	4,643,157	2,676	7.3
2002	4,772,537	2,724	7.5
2003	4,913,666	2,775	7.6
2004	5,240,525	2,926	8.0
2005	5,549,824	3,057	8.4
2006	5,728,518	3,104	8.5
2007	5,722,100	3,055	8.4

Environmentally, the decline in both total and per capita waste generation is a positive development. Generation is a crude measure of consumption, and for many materials, the environmental impacts of production (the corollary of consumption) is many times higher than the impacts of disposal.

Recent analysis by the U.S. EPA suggests that roughly half of the country's greenhouse gas emissions are associated with the production and transportation of goods. The leveling off of waste generation in 2007 may indicate a leveling off in the emissions of unwanted greenhouse gases in all stages of the life cycle of materials. Further research is needed to evaluate this hypothesis.

Recovery Rates

Oregon recovered 2,458,041 tons of materials in 2007, which is a decrease of 65,326 tons from 2005. Thus, the state's calculated recovery rates decreased slightly in 2006 and 2007 from its high of 45.5% in 2005 (see table). However, these calculated rates do not include the 2% credits for wastesheds that operate reuse and backyard composting programs. These activities decrease waste generation, but are hard to quantify, so the Legislature created these credits and mandated their inclusion in the state's official recovery rate, starting in 2001.

Year	Tons	Calculated Rate	Rate w/ 2% Credits
1992	839,679	27.1%	
1995	1,257,204	34.7%	
2000	1,765,817	38.9%	
2001	1,999,085	43.1%	46.8%
2002	2,029,261	42.7%	46.3%
2003	2,116,880	43.1%	46.8%
2004	2,317,064	44.2%	48.0%
2005	2,523,367	45.5%	49.2%
2006	2,495,344	43.6%	47.3%
2007	2,458,041	43.0%	46.7%

Materials. Oregon's 2007 recovery rate of 46.7% includes materials collected for recycling or composting, as well as some material burned for energy recovery. Major categories of recyclables include:

Metal: 397,882 tons recovered. The amount of recovered metal increased 7.7% from 2006. This partially counters the large drop in metals recovery that occurred between 2005 and 2006.

Paper: 792,505 tons recovered. Overall, paper recovery rose less than 1%.

Organic material (wood waste, yard debris, food waste): 1,021,494 tons recovered. The amount of organic materials recovered decreased almost 5%, which may be due to a decrease in construction in 2007.

Electronics: 9,813 tons recycled. While this is a relatively small number, it represents a huge increase of 54.7% from 2006's figures.

Glass: 97,827 tons recovered. This is a 1% increase in the past year.

Wasteshed rates. Eighteen of Oregon's 35 wastesheds had recovery rates in 2007 that were greater than or equal to their 2006 rates. Twenty wastesheds are already exceeding their 2009 recovery goals. In addition to updating their recovery plans (required in 2005 and 2010), wastesheds that do not meet their recovery goals must prepare a technical review to determine why they aren't meeting them and find ways to achieve their goals. DEQ will provide assistance in this process if requested by wasteshed representatives. Wastesheds may also petition DEQ for a change in their goals.

Energy savings. Manufacturers save large amounts of energy when they use recycled materials instead of virgin resources. Recycling in Oregon in 2007 (not including composting or energy recovery) saved about 30 trillion BTU (British thermal units), which is the equivalent of 241 million gallons of gasoline. It is also equivalent to 2.7 percent of 2007 estimated total statewide energy use.

Greenhouse gas reductions. The estimated greenhouse gas reductions from recycling, composting, and energy recovery in 2007 are equal to 3.6 million metric tons of carbon dioxide, or the equivalent of reducing the emissions from 790,000 passenger cars. It is also equivalent to reducing 5.1 percent of 2007 estimated statewide greenhouse gas emissions. The greenhouse gas benefits of waste recovery are partly the result of the large energy savings industries gain by using recycled materials in manufacturing.

More detailed information on waste generation, material recovery, and specific watershed programs can be found in the 2007 Oregon Material Recovery and Waste Generation Report on the DEQ solid waste webpage at <http://www.deq.state.or.us/lq/sw/index.htm>

Disposal Data

The amount of “counting” solid waste disposed in Oregon in 2007 was 3,264,059 tons or 1,743 pounds per person per year, based on a statewide population of 3,745,455¹. The total amount of material disposed increased by only 30,844 tons from 2006 to 2007. With the increase in population, this means that the per capita disposal actually fell 9 pounds per person or just under 1% between 2006 and 2007. This is not as insignificant as it may appear. For years, the per capita disposal amounts have risen drastically. This is the first year of decreasing per capita disposal, which could represent a potential shift toward real sustainability.

Disposal facilities. Oregon has 26 operating municipal solid waste landfills, one mixed solid waste energy recovery facility, and one mixed solid waste incinerator. With so many landfills that have closed in the past two decades, Oregon has the potential for some of them to leak contamination. Thus, the need for regulatory oversight continues well beyond the date at which a facility stops accepting waste for disposal. Continued monitoring of groundwater and methane gas levels may be necessary for decades after a facility closes.

Many of the landfills that remain open are larger facilities that accept waste on a regional rather than a local basis. Some of these landfills are among the nation’s largest, providing Oregon with sufficient disposal capacity for many years to come.

Santosh Landfill. In October 2008, DEQ completed installation of a state of the art landfill cap at Santosh Landfill in Scappoose. The impermeable cap prevents precipitation from coming into contact with the waste, and therefore reduces the risk of groundwater contamination. The 15-acre landfill accepted waste from 1970 to 1983. DEQ has monitored environmental conditions at the site

since 2004, when contaminated water was observed leaching out of the south side of the landfill.

The construction involved regrading the landfill with about 43,000 tons of imported soil and rock to promote drainage. The impermeable cap is a geocomposite clay liner consisting of a layer of processed clay sandwiched between two layers of geotextile fabric. The landfill improvements also include a landfill gas venting system and a storm water collection system. The site was covered with 48,000 tons of topsoil and seeded with native grasses. In 2007, a portion of the landfill was regraded and capped, and DEQ constructed and fenced an enhanced wetland area nearby, where about 700 native trees, shrubs, and ground cover species were planted. The \$3.5 million dollar project was funded by the Solid Waste Orphan Account.

For more detailed information about disposal facilities and amounts and types of waste disposed, see the 2007/2008 Disposal Status document on the DEQ webpage at <http://www.deq.state.or.us/lq/sw/index.htm>, where you can also look up the locations of disposal facilities in Oregon on the Facility Profiler.

Waste Characterization

Oregon regularly conducts solid waste composition studies as required by state law (Oregon Revised Statutes 459A.035). A new study will begin in 2009. Previous studies were conducted in 2005/06, 2002, 2000, 1998, 1994/95, and 1992/93. Data for a recycling composition study were also gathered in 2004/05. The Metro regional government also conducted studies in 1993/94 and earlier. Metro, the cities of Portland and Eugene, and Marion County have all contributed to some or all of the composition studies conducted since 1998.

The information gained by these studies allows local governments and recycling businesses to target recycling efforts toward materials that are still being thrown away. It is also used to determine the recycling rate for rigid plastic containers. Oregon law establishes recycling or reuse requirements for rigid plastic containers sold or offered for sale in Oregon. One way that all plastic container manufacturers and product manufactures can be assured that they are in compliance with Oregon law is if the aggregate recycling rate for compliance purposes remains above 25%. DEQ has determined that the rate will be above 25% for 2009.

The recent statewide waste composition studies show some positive trends. The percentage of recyclable paper, glass, and scrap metal being disposed was less in 2002 than in earlier studies. This decrease appears to be caused by increases in recovery of these materials. Paper (recyclable and non-recyclable) remains the largest group of materials disposed by weight, and food waste remains the largest single material disposed.

Complete results of 2005 and earlier waste composition studies can be viewed or downloaded from DEQ’s webpage at <http://www.deq.state.or.us/lq/sw/index.htm>.

¹ “Counting” solid waste includes municipal solid waste, waste tires, construction and demolition debris, animal waste and grease, and some inerts such as gypsum.

2007 Legislation

Electronics Recycling Program (Oregon E-Cycles)

Legislation passed in 2007 created a new statewide electronics recycling program financed by manufacturers, beginning in January 2009. Covered devices (CEDs) are computers, laptops, monitors, and televisions. The program is branded Oregon E-Cycles and provides convenient recycling opportunities for households, non-profits, and small businesses. Manufacturers must participate in the program in order to sell their covered products in Oregon. Program information is available at a new website (www.Oregonecycles.org) and hotline (1-888-5ecycle). Oregon E-Cycles also educates and encourages electronics recycling via retailers' point-of-sale information and outreach through local governments and solid waste haulers.

Oregon E-Cycles has a number of requirements for manufacturers and retailers. It:

- Directs manufacturers to annually register all brands of CEDs with DEQ by December 31.
- Requires manufacturers to choose, by July 1 of each year, to participate in the DEQ-managed state program or implement their own recycling plan.
- Requires the state contractor and manufacturer recycling programs to be operational by January 1, 2009.
- Prohibits retailers from selling CEDs as of January 1, 2009 unless the manufacturer is in compliance with statutory requirements.
- Prohibits the final disposal of CEDs as of January 1, 2010.

Program Status

Registration. In the first cycle (calendar year 2008), 205 manufacturers registered. Registration takes place between October 15 and December 31 each calendar year. After manufacturers register, DEQ staff review their data before placing them on an online list of registered brands.

State contractor program. DEQ contracted with the National Center for Electronics Recycling to run the program on behalf of 179 participating manufacturers. Their collection goal for 2009 is 4.2 million pounds.

Manufacturer programs. Four manufacturer plans, representing 27 manufacturers, were submitted for 2009. DEQ's conditional approval of these plans allowed representatives to finalize statewide collection networks. Three programs were approved. The 2009 total collection goals for these programs is 8 million pounds.

Retailers. DEQ has developed a variety of point-of-sale materials for retailers to be able to download and print in order to meet their requirement to provide program information to consumers. DEQ updates its web-based list of registered brands on the first of every month. Retailers can check the list

to ensure they are selling only registered brands. As of December 2008, 1,427 brands are listed.

Program Financing. The total 2008 registration fees, which are used to administer the program, are \$389,160 (invoiced). The total 2009 recycling fee amount is projected to be approximately \$1,400,000. Recycling fees are used for state contractor program costs. On Sept. 26, 2008, the E-Board approved DEQ's request for limitation to pay for the state contractor program. Manufacturer programs pay their own costs.

DEQ role

DEQ staff promoted the program at the Oregon State Fair and other venues. They have distributed media kits, planned kickoff events for early January, and prepared toolkits for retailers and local governments, FAQs, and fact sheets. DEQ is continuing to meet with the E-Waste Advisory Group to implement the program. In 2009, DEQ will coordinate the recycling programs, design a sampling strategy for returns, develop enforcement strategies, prepare for the 2010 disposal ban, continue to work with the advisory group and legislative subcommittees, and start rulemaking.

Expansion of the Bottle Bill

Oregon enacted the first bottle bill in the country in 1971, primarily as a litter control measure. The bottle bill remained unchanged (except for minor modifications) until the 2007 Legislature expanded it by adding a 5-cent refundable deposit to water and flavored water beverage containers, effective January 1, 2009. In 2005, Oregonians bought nearly 200 million bottles of water, with an estimated 125 million thrown in the trash. In 2007 and 2008, these numbers were likely substantially higher. Adding water bottles to the refundable deposit program will encourage recycling, help conserve energy, reduce greenhouse gas emissions, and reduce solid waste.

Although beverage container litter has been substantially reduced as a result of the bottle bill, the bill's effect on waste reduction and resource conservation has been its most remarkable feature. During the last 35 years, return rates for beverage containers in Oregon have exceeded 80% and some years have been as high as 94%. Although the estimated return rate for bottle bill containers has dropped to 83% for 2005 (latest data available) and possibly lower in later years, the rates for other beverage containers are considerably lower, as shown below. The 2005 estimated total return rate for all non-deposit beverage containers is only 37 percent.

Studies of solid waste disposal show that fewer than 20 percent of the 1.5 billion deposit beverage containers used in Oregon in 2005 were disposed of in landfills, while more than 1 billion were recovered and recycled. DEQ estimates that Oregonians purchased almost 2 billion beverage containers (deposit and non-deposit, not including paper containers such as juice boxes) in 2005.

Estimates of Beverage Container Redemption, Recycling, 2005
(in millions of containers)

	Disposed	Recycled*	Redeemed	Total	Percent Recycled/Redeemed
Beer & soft drink-deposit	254.8	63.0	1163.1	1480.9	82.8%
Water	125.5	60.7		186.2	32.6%
Juice/tea/other	126.0	54.1		180.1	30.0%
Milk	43.6	37.2		80.8	46.1%
Wine	11.5	26.4		37.9	69.6%
Liquor	9.3	7.4		16.8	44.4%
Total no-deposit	316.0	185.9		501.8	37.0%
Beer/soft drink/water/juice	506.4	177.8	1163.1	1847.2	72.6%
All beverages (no paper)	570.8	248.9	1163.1	1982.8	71.2%

*Recycled, but not redeemed

In addition to adding water bottles to the bottle bill, the 2007 legislation allows small stores to further limit the number of empty containers they accept for refunds and to continue to refuse to take back container brands they do not sell. Stores occupying less than 5,000 square feet of space may limit customers to returning no more than 50 empty containers per day, while larger stores must continue to accept up to 144 containers per person per day. Beginning January 1, 2009, large stores occupying 5,000 square feet or more must begin accepting empty containers of any brand or size, if they sell the same kind of beverage. For example, a large store that sells soft drinks must accept and pay a refund on any brand of soft drink container.

The 2007 legislation also created a task force to study and make recommendations on bottle bill matters such as whether other beverages should be added to the bottle bill, the refund value should be raised, and new redemption centers should be established. DEQ staff provided extensive research and data on these issues to help inform the task force’s recommendations. The task force recommended that the 2009 Legislature:

- Support an industry proposal to run a statewide system of redemption centers;
- Expand the list of beverages to include sports drinks, coffees, teas, juices, liquors and other beverages (except milk or milk substitutes), effective January 1, 2013;
- Increase the refund value to 10 cents, effective January 1, 2011;
- Allow the state to collect unredeemed deposits only if the industry-run redemption center system is not successful and a state-run system is implemented.

The full report is available at http://www.leg.state.or.us/comm/commsrvs/Bottle_Bill_Final_Report.pdf. DEQ is proposing a 2009 legislative concept, based on the task force’s recommendations. More information is available at <http://www.deq.state.or.us/lq/sw/bottlebill/index.htm>.

General Programs

Waste Prevention

It has long been the policy of Oregon that prevention and reuse, which both reduce waste generation, have priority over recycling, composting, energy recovery, and landfilling as methods of managing solid waste. The 2001 Legislature set Oregon’s first statutory waste prevention goals, noting that: “There are limits to Oregon’s natural resources and the capacity of the state’s environment to absorb the impacts of increasing consumption of resources, including waste generation and increasing solid waste disposal....It is in the best interests of the people of Oregon to conserve resources and energy by developing an economy that encourages waste prevention and recycling.” The goals are:

- For the calendar year 2005 and subsequent years, no annual increase in per capita municipal solid waste generation; and
- For the calendar year 2009 and subsequent years, no annual increase in total municipal solid waste generation.

In December 2007, DEQ adopted a Waste Prevention Strategy as a framework for its work to reduce solid waste generation in Oregon over the next 10 years. The strategy also contains a summary of actions DEQ proposes to undertake in the next three years in specific focus areas.

Vision: Oregon residents and businesses have made a value shift from a “throw-away” society to living and prospering sustainably and making choices in their consumption and use of resources that result in decreased waste generation and a healthier environment.

Design, Construction, Remodeling and Demolition of Buildings

An increase in construction, remodeling and demolition waste is one of the largest contributors to the recent growth in Oregon's waste generation. Broadly speaking, choices about building design, materials, construction, and remodeling practices all have significant bearing on Oregonians' overall environmental impacts. Because buildings are long lasting, design choices made in the next 10 years will impact the environment for decades.

In 2008, DEQ hired a waste prevention specialist to research building practices and environmental impacts and to design and implement projects to reduce environmental impacts through partnerships with architects, builders, remodelers, and the organizations that serve them, such as deconstruction operations. In 2009, a variety of waste prevention practices will be screened for their environmental benefits, cost, feasibility, and ease of implementation, in order to select those that offer the most potential for achieving environmental improvements.

Business Practices — Packaging

Businesses may generate almost half of all municipal solid waste, and 20-30% of all municipal solid waste is packaging. In addition, product design and packaging decisions made by businesses shape the waste generated by other sectors (households, construction). Enhancing business sector waste prevention efforts also supports the state's efforts to be more sustainable in its own operations.

DEQ's short-term focus on packaging capitalizes on our recent experience in this area and the burgeoning interest in "sustainable packaging" at the national level. For example, DEQ is a member of the Steering Committee of Wal-Mart's Sustainable Packaging Value Network and in this capacity is helping Wal-Mart achieve greater levels of waste prevention and broader environmental improvement through its far-reaching influence up the supply chain. DEQ also periodically provides information to Oregon businesses seeking to prevent waste in packaging.

Foundation Research and Analysis

Ongoing research and analysis will improve DEQ's effectiveness in preventing waste. DEQ will continue to research changes in and causes of waste generation and build capacity in Oregon around environmental analysis of materials and wastes. DEQ also plans to conduct special studies, including but not limited to, an evaluation of the impact of waste prevention on Oregon's economy.

Water bottle life cycle analysis. Water bottles are one of the fastest-growing components of waste generation: 32 million bottles were disposed in Oregon in 1998, rising to 125 million disposed in 2005. There is growing interest in the impacts of bottled water, but limited transparent evaluation on its impacts, particularly for the United States. To help DEQ and Oregonians understand the relative environmental benefits (and impacts) of disposal, recycling, and prevention, DEQ is commissioning a life cycle inventory and impact analysis of options for

delivering drinking water. The study is evaluating the impacts of: choice of packaging materials, recycled content, distance traveled, end-of-life recycling rate, washing of reusables, and many other factors for single-serving bottles, 5-gallon reusable water coolers, and tap water. The study will analyze energy requirements and environmental emissions for fuel consumption, material production for containers, fabrication processes, drinking water treatment, water bottling operations, bottled water distribution, drinking water cooling processes, container washing, and waste management.

Greenhouse gas accounting. The conventional method for inventorying greenhouse gas emissions at the level of a state or community significantly undercounts the emissions resulting from waste generation and the "upstream" consumption (and production) of goods. Further, by mixing consumption- and production-related emissions together, conventional inventories mask some of the ultimate drivers of emissions. In 2009 a contractor will draft a report for DEQ on the greenhouse gas impacts associated with consumption of materials by Oregonians and relate these emissions back to the conventional state greenhouse gas inventory. This inventory will include the emissions resulting from the consumption of goods, regardless of where the emissions actually occur, which is consistent with how Oregon counts emissions resulting from consumption of electricity. The inventory will help policymakers and the general public better understand the role of consumption, imports, and local, domestic, and international supply chains in contributing to greenhouse gas emissions.

DEQ is also working with other state and local governments and EPA to encourage changes in greenhouse gas inventory protocols for state and local governments to better document and understand the role of materials and the potential benefits of waste prevention and recycling.

Other Waste Prevention Work

DEQ Solid Waste Program technical assistance staff provides guidance to individuals, private businesses, and local governments on many aspects of waste prevention and recovery. These staff members are located in DEQ's regional offices in Eugene, Salem, Portland, Bend, Pendleton, and The Dalles.

Waste prevention information is available on DEQ's webpage, including a commercial waste reduction clearinghouse. DEQ staff also provides numerous presentations on waste prevention to audiences such as industry groups and Master Recycler organizations.

Solid waste grants. Since 1991, DEQ has awarded 216 solid waste reduction grants to local governments (another 51 grants have been awarded for household hazardous waste collection and facilities and 19 for waste tire collections). Beginning in 2000, DEQ made it easier for projects that reduce waste generation to receive funding by designating waste prevention projects eligible for additional scoring points. Of the 216 solid waste reduction grants, 79 have been for projects with significant waste

prevention and/or reuse elements, and 65 of those were awarded since the waste prevention focus area was instituted in 2000. As a result, communities across the state have implemented an impressive array of projects, including building an infrastructure for the salvage of reusable building materials, computer and furniture reuse, and edible food donation programs.

Product Stewardship

Product stewardship calls on those involved in a product's life cycle to share responsibility for reducing the environmental impacts of the product. In the product stewardship model, everyone from designers, manufacturers, retailers, consumers, waste managers, and disposers, is responsible for the products they create or use. The greater the ability of a party to influence the life cycle of a product, the greater the responsibility.

Both voluntary and regulatory product stewardship is a growing trend nationally and internationally as waste streams change and become more complex and costly to manage. Although current efforts focus primarily on end-of-life management issues, the long-term goals are to affect the design of products so that they are less toxic, have minimized environmental impact, and are more readily reused or recycled. Besides dealing with waste management issues, product stewardship can result in conservation of resources and protection of air, land, water, and human health. To encourage these changes, it is important to internalize the costs of end-of-life management into the costs of producing and selling products so that government and the tax-paying public do not bear costs for dealing with the discarded products.

Legislative framework. In 2008, the Environmental Quality Commission (EQC) made a product stewardship approach to waste management a priority and approved moving forward with proposed legislation to create a common framework or system for producer responsibility for toxic and difficult-to-manage products found in the solid waste stream. The framework would set up a consistent approach for adding products and implementing programs where the producer is responsible for products throughout their life cycle, including financing and implementing reuse and recycling programs. The concept also includes incentives for:

- Reduced use and/or elimination of toxics in products;
- Lower environmental impacts such as greenhouse gas emissions; and
- Changes that will make products more readily upgradeable, reusable, and recyclable.

DEQ is working with the Northwest Product Stewardship Council, local governments, Recycling Advocates, product representatives, and others to develop the concept. Washington, California, and Minnesota are working on similar legislation. The states are collaborating to harmonize legislation where possible so that programs and requirements can be similar from state to state.

DEQ is also working on a number of individual products, including thermostats, paint, pharmaceuticals, fluorescent lamps, and rechargeable batteries.

Mercury thermostats. Following national product stewardship discussions between governments (including DEQ) and manufacturers, the amount of mercury used in thermostats has decreased significantly. However, DEQ estimates that there are many mercury thermostats still in use or being replaced with programmable digital devices. The Thermostat Recycling Corporation (TRC), operated by the National Electronics Manufacturers Association (NEMA), provides free collection of mercury thermostats for HVAC contractors through the wholesale distribution system. In 2006 and 2007, DEQ participated in an incentive pilot project with the TRC, thermostat manufacturers, Product Stewardship Institute, Portland General Electric (PGE), and the State of Indiana to increase participation and the recovery of mercury. The program provided \$4 rebates that could be used on the future purchase of Energy Star thermostats to contractors who turned in old mercury thermostats. The one-year pilot resulted in a doubling of the rate of thermostats collected, increased wholesaler and contractor participation, and collection of more than 54 pounds of mercury. The final report on the project is available online on the DEQ Land Quality Mercury web page.

Following the pilot, in late 2007 DEQ began working with a subset of contractors who are eligible to have their own TRC bins. In the first two months, 17 TRC collection bins were ordered. DEQ conducted outreach to contractors and offered to pay the one-time cost (\$25) to purchase the collection bins. In 2008, DEQ initiated efforts to expand retail collection programs in Oregon by working with TRC and the corporate office of a national hardware store chain. Again, DEQ is offering to purchase collection bins for the stores. Two stores signed up in 2008.

Paint. DEQ has participated in the national Paint Product Stewardship Initiative since 2003 in an effort to develop a nationally coordinated system to collect leftover paint. As a result of this work, Oregon will be in the first group of states to begin a paint collection system (in 2009 or 2010) after a demonstration is completed. In addition, DEQ has played a lead role in the development of a national life cycle analysis and cost benefit analysis, both funded by the paint industry, to evaluate the full social and environmental costs and benefits of various methods of handling leftover latex paint.

Pharmaceuticals. DEQ participated in and helped to fund the Oregon Pharmaceutical Take Back Stakeholder Group, which was facilitated by the Oregon Association of Clean Water Agencies. The group met for one year and produced a final report and recommendations in July 2007. The stakeholder group recommended a product stewardship program. The pharmaceutical manufacturers and over-the-counter drug companies were requested to devise and implement a convenient and effective program for consumers to dispose of unwanted medicine. DEQ's director, the EQC, and many others have endorsed this program. The report is available at www.oracwa.org.

Fluorescent lamps. With the recent emphasis on energy conservation, the use of fluorescent lighting is increasing, creating a need for safe end-of-life handling systems as well as improved product design to eliminate concerns related to mercury releases from broken lamps. DEQ is currently participating in a national dialogue with manufacturers, retailers, environmental groups, and state and local governments. The purpose of the dialogue is to reduce the environmental impact of lamp manufacturing, increase the use of environmentally preferred lighting, and maximize the safe collection and recycling of fluorescent lamps, including compact fluorescent lamps, through a product stewardship and producer responsibility approach.

Rechargeable batteries. For many years, the Rechargeable Battery Recycling Corporation (RBRC), a voluntary manufacturer organization, has been sponsoring the collection and recycling of rechargeable batteries in Oregon through a retail collection program. However, the program collects a very low percentage of batteries for recycling. DEQ is currently working with an Oregon-based group, including RBRC, state and local governments, and an environmental group, to look at the barriers and opportunities for improving the rechargeable battery recycling program in Oregon.

Chemical policy reform. Many harmful chemicals are used in manufacturing processes and in products without adequate laws to protect human health and the environment. DEQ participates in and supports statewide and regional conversations about chemical policy reform. The intent of these effort is to address deficiencies in federal chemical regulations, primarily the Toxic Substances Control Act (TSCA), and gaps in the laws that allow known chemical hazards to be used in products and processes and prevent disclosure of the chemicals used in products and materials and the information used to assess chemical hazards or identify safer alternatives.

In June 2007, DEQ participated in a one-day chemical policy workshop held in conjunction with the regional conference of NAHMMA (the North American Hazardous Materials Managers Association). Following the workshop, the Oregon Chemical Policy Roundtable was formed. The Roundtable is a coalition of state and local government staff and non-governmental organizations that are working to identify, develop, evaluate, and disseminate key chemical research and policy questions. The Roundtable is working to identify and craft innovative ideas for executive and legislative actions that support new chemical policies and toxics reduction in the state.

Household Hazardous Waste

Opportunities to safely dispose of household hazardous waste (HHW) continue to expand. In 2007, 64% of Oregon residents had local access to facilities that collect HHW on multiple days throughout the year, and another 18% had convenient access to at least one special collection event. With the goal to address the highest risks first, DEQ continued to award HHW grants and to provide collection events for households and conditionally exempt generators (CEGs) in those areas without locally-sponsored service.

DEQ-sponsored HHW collections. DEQ sponsored six household hazardous waste collection events in 2006-2007 that attracted 1,624 participants who disposed of their waste free of charge. The average amount of waste collected per participant was 115 pounds and included pesticides; mercury; and paint, automotive and cleaning products. One of the events (Lexington) was subsequently paid for by Morrow County. DEQ also provided emergency HHW collections after the December 2007 floods in the Vernonia area.

DEQ offered collection of conditionally exempt generator (CEG) and agricultural pesticide waste at all DEQ-sponsored HHW events. The participants pre-registered with DEQ's contractor and paid for disposal.

DEQ continues to focus on increasing the collection of mercury and mercury-containing products.

- DEQ continued a program to collect mercury and mercury-containing goods free of charge from conditionally exempt generators at local and DEQ-sponsored collection programs.
- DEQ began a new program designed to collect elemental (liquid) mercury from homeowners who have three or more pounds of mercury. DEQ's contractor collects the mercury if the household is unwilling or unable to deliver it to a permanent HHW facility.
- DEQ continued to offer a mercury thermometer exchange program. At most locally-sponsored and all DEQ-sponsored events, DEQ provided digital thermometers to participants who brought in mercury thermometers for disposal.

In 2007, DEQ changed its process for selecting communities for DEQ-sponsored HHW events. DEQ no longer requires local governments to submit event applications. Instead, events rotate around the state according to a standardized "queue". This new approach reduces work for local governments, provides access to events to a larger number of Oregonians, and improves predictability and DEQ's ability to inform local governments and residents of upcoming events.

Local government HHW collection programs. Many local governments provided HHW collection services in 2006-2007 at permanent facilities, one-day events, or a combination of facilities and events. Eleven of these locally-sponsored events were provided under DEQ's

“purchaser program” that allows local governments to use DEQ’s contract and contractor, although the local governments pay for the service.

HHW grants. In 2006-2007, DEQ awarded grants to help Tillamook, Crook, Curry/Coos (regional plan), and Union/Baker/Wallowa (regional plan) counties develop local HHW management plans. DEQ also awarded grants to help Tillamook County and the Union/Baker/Wallowa County HHW consortium build collection facilities.

HHW priority assessment. In 2006-2007, DEQ developed a “priority assessment” tool to help allocate DEQ resources to address the materials and situations that pose the greatest risks to human health and the environment. As a result of this assessment:

- Beginning in 2008, DEQ is discouraging the delivery of latex paint to its collection events and will conduct outreach on alternative management options.
- The geographic component of the tool was used to evaluate the communities selected for DEQ-sponsored collection events in 2008.
- The materials portion of the tool was used to focus potential product categories for a comprehensive waste prevention project.

HHW prevention. DEQ continues to distribute two educational resources to help Oregonians reduce their use of toxic substances at home: *Natural Gardening* and *The Hazardless Home Handbook*, which was updated with information on managing unwanted pharmaceuticals. DEQ distributes both documents via the Internet and in hard copy to city and county governments and nongovernmental organizations that distribute them to interested residents. DEQ also provides financial and technical assistance to local governments to conduct outreach and education efforts focused on using less toxic substances.

HHW survey. In 2008, DEQ commissioned a statewide telephone survey of Oregonians to help in the design and evaluation of public information and outreach efforts and for broader program development and evaluation purposes. The survey addressed many hazardous household substances, including unwanted pharmaceuticals, compact fluorescent light bulbs, paints, lawn pesticides, strong household cleaners, and lead fishing weights.

Compost Facility Rulemaking

When DEQ began permitting compost facilities in 1999, 24 facilities composted about 300,000 tons of organic materials. The industry has grown, more types of materials are collected for composting, and new technologies are under consideration or in use. In 2007, there were 46 permitted facilities, and more than 525,000 tons of materials were reported received by compost facilities under DEQ permit. DEQ and composters decided that it was time to update DEQ’s rules regulating composting facilities to protect human health, water quality, and the

environment, while continuing to support Oregon’s composting industry.

To accomplish those goals, the Solid Waste Program proposed amendments to the compost facility administrative rules in 2007. After reviewing many responses received in an extensive public notification process, DEQ decided to withdraw the proposed amendments and take a new approach. DEQ is now proposing amendments that would create a performance-based regulatory system, screen individual sites for environmental risks, and tailor operating plan and permit requirements to each facility. The proposed changes will also clarify financial assurance requirements for solid waste disposal facilities and public notice requirements for renewal of several types of solid waste permits.

Beneficial Use of Solid Waste

In Oregon and elsewhere, awareness of potential opportunities to convert wastes to resources is increasing. DEQ receives numerous requests every year to approve beneficial uses of various solid wastes that would otherwise require permitted disposal. In 2007, the Solid Waste Program began researching how other states regulate the beneficial use of solid wastes. In 2008, DEQ started working closely with a group of affected stakeholders to scope beneficial use issues and initiated a rulemaking process to develop beneficial use rules.

Beneficial use often involves either using an industrial waste in a manufacturing process to make a product or using the waste as a substitute for fill materials. Examples are the use of spent foundry sand from the steel industry as a substitute for virgin sand in making concrete, or the upland placement of dredged sediments as construction fill material. The use of industrial waste materials conserves energy, reduces the need to extract virgin resources, diverts waste from landfills, and supports DEQ’s goal of promoting sustainability.

The rulemaking will continue into 2009 with a public comment period on the draft rules followed by a proposal to the Environmental Quality Commission for rule adoption in fall 2009. The intent of the new rules will be to provide a regulatory process and funding mechanism for DEQ to respond to and authorize requests for approval to use wastes as an alternative to landfill disposal.

Complete Report

Executive Summary (this document)

Appendices (available at www.deq.state.or.us/lq/sw/index.htm)

2007/2008 Disposal Status, State of Oregon

2007 Oregon Material Recovery and Waste Generation Report

Oregon DEQ Waste Prevention Strategy: Ten-Year Framework and Short-Term Plan

Oregon Household Hazardous Waste Report, 2006-2007