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Background Brief on ...

Waste Management and Recycling

During the mid-1600s, the City of New York instituted the nation's first waste disposal regulations when it banned dumping garbage in the streets. Since then, solid and hazardous waste management has evolved to protect human health and the environment through proper management, disposal, and waste reduction programs, with increasing emphasis on waste prevention, recycling and product stewardship.

Solid Waste Management

The Resource Conservation and Recovery Act of 1976 (**RCRA**) is the primary federal law that governs the disposal of solid and hazardous waste under the direction of the Environmental Protection Agency (**EPA**) in partnership with the states.

Solid waste in Oregon is principally overseen by the Department of Environmental Quality (**DEQ**) under RCRA and state solid waste law. The DEQ responsibilities include: issuing disposal permits and monitoring compliance; responding to complaints about disposal issues; administering solid waste grants; overseeing local government recycling programs; conducting a household hazardous waste-program that promotes prevention and permanent collection facilities; conducting studies of material recovery rates and waste composition; conducting studies of the life cycle impacts of materials, including greenhouse gas impacts; and providing education and technical assistance about waste prevention and recycling.

Local governments are responsible for planning for solid waste management and must provide the opportunity to recycle to every person in their jurisdictions. Most local governments in Oregon enter into franchise agreements for residential and commercial garbage and recycling collection services. Open dumping of solid waste is prohibited in Oregon, with lawful disposal confined to permitted composting, energy recovery, incineration or landfill facilities. Hazardous and infectious waste streams are not accepted by standard landfills and require special handling. Oregon law prohibits the disposal of lead acid batteries, used oil, whole tires, discarded vehicles, large metal-jacketed appliances and certain electronics. Some landfills accept only construction and demolition wastes and inert materials.

Hazardous Waste Management

According to the EPA, solid waste may be deemed hazardous if has ignitable, corrosive, reactive, or toxic properties. Amendments to the federal RCRA in 1984 added special requirements for the handling of hazardous wastes, including managing the generation, transportation, storage, treatment, and disposal of these materials. The EPA first approved Oregon's hazardous waste program in 1986 and updated this authorization in 2010, allowing Oregon to implement federal requirements while EPA retains federal oversight authority. Hazardous waste generation, transport, storage, and disposal on Tribal lands, however, continue to be under federal jurisdiction. In 1995, EPA adopted the Universal Waste Rule to ease the regulatory burden on businesses in managing hazardous waste. The Universal Waste Rule authorizes certain hazardous wastes including lead-acid batteries, pesticides, mercury-containing equipment, and fluorescent lighting to be managed under less stringent streamlined requirements that encourage collection, recycling or disposal.

Oregon's statewide hazardous waste program was enacted to protect "the public health and safety and environment of Oregon to the maximum extent possible" (ORS 466.010). Key hazardous waste program elements include environmental permitting for hazardous waste

management and disposal facilities and inspections, enforcement, and technical assistance to businesses and local governments. The DEQ's hazardous waste program promotes toxic use reduction across all entities it regulates. Product stewardship programs and expanding the range of products to be recycled are the focus of recent waste reduction efforts.

The DEQ promotes the reduction and safe management of hazardous waste at more than 550 hazardous waste generation facilities, issues permits to hazardous waste management facilities, and conducts inspections of hazardous waste generators and used oil processors, and DEQ's Technical Assistance program assists hundreds of Oregon's small businesses in complying with complex state and federal hazardous waste regulations. In addition, the hazardous waste program registers and provides assistance to universal waste handlers and destination facilities.

Federal law exempts households from the universal waste disposal requirements; therefore, a small but important part of Oregon's solid waste management program is the Household Hazardous Waste (**HHW**) Program. Household hazardous waste includes pesticides, herbicides, poisons, corrosives, solvents, fuels, paints, motor oil, antifreeze, and mercury-containing waste. This program focuses on education to reduce the amount of hazardous waste in landfills and provides grants to local governments to help them establish permanent HHW collection facilities. Under this program, rules were developed for the labeling of mercury-containing thermometers as required by state legislation passed in 2001. Recent product stewardship legislation has been focused on increasing household hazardous waste collection.

Oregon's Waste Reduction Goals and Recovery Rates

Oregon's first Solid Waste Management Plan was adopted in 1979. The 1995-2005 Solid Waste Management Plan changed the state's focus from conserving landfill space to viewing waste and recyclables as valuable resources

with the ultimate goals of conserving natural resources and reducing the environmental impacts associated with resource consumption. The 2001 Legislative Assembly placed these policy goals in statute and set the following waste prevention goals:

- No annual increase in per capita municipal solid waste generation for calendar year 2005 and subsequent years.
- No annual increase in total municipal solid waste generation for calendar year 2009 and subsequent years.

In addition, the state's recovery goal was set at 50 percent for 2009. Waste generated is equal to materials recovered plus solid waste disposed, while the recovery rate is the percentage of the total waste generated that is recovered in recycling, composting or energy recovery.

The DEQ has adopted a Waste Prevention Strategy to set priorities and define direction for its waste prevention and reuse activities to achieve these goals. According to DEQ's Oregon Solid Waste Management 2009-2010 Update, the 2009 waste generation rate equated to 2,444 pounds per person per year, compared to 3,036 pounds per person per year in 2007, so Oregon is meeting its per capita waste generation goal of no annual increase over the 2005 amount. In addition, total solid waste generation declined since 2007 to 4,671,845 tons of solid waste generated in 2009, which means that Oregon met its second goal of no increase in total municipal solid waste generation for 2009. However, declining economic conditions rather than new programs have probably been the main factor responsible for meeting the reduced generation goal as people tend to buy (and discard) less material during economic downturns. In addition, the statewide recovery rate has increased steadily since it was first calculated in 1992, peaking in 2005 at 49.2 percent (including 2 percent watershed composting credits) and leveling off at 48.4 percent in 2009, just below the goal of 50 percent.

Current Recycling Requirements for Local Governments

The Opportunity to Recycle Act (1983) requires cities and counties to ensure that their residents are being provided with opportunities to recycle that meet the minimum requirements of state law. For cities with a population over 4,000, this means that residents who have garbage collection service must also be provided with recycling service, recycling education and promotion. In addition, the city must make sure that at least three of the following "menu items" are being provided:

1. Weekly, residential curbside collection of source-separated recyclable materials on the same day as garbage service. (If this program element is not implemented, a minimum of monthly curbside collection is still required.) Local governments must also give notice to each person of the opportunity to recycle and encourage source separation of recyclable materials through an education and promotion program.
2. An expanded recycling education and promotion program that includes, among other things, recycling collection promotion directed at residential and commercial solid waste service customers and generators at least four times a year.
3. Provision of at least one durable recycling container directly to each residential collection service customer.
4. Recycling collection service provided to multi-family dwelling complexes having five or more units.
5. Residential yard debris collection program for collection and composting of residential yard debris.
6. Regular, on-site collection of source-separated principle recyclable materials from commercial generators.
7. Establishment of an expanded system of recycling depots that are conveniently located to the population served.
8. Garbage collection rates established as a waste reduction incentive, including a mini-can option.
9. A collection and composting program for commercial and institutional food waste,

non-recyclable paper and other compostable waste.

All cities with a population of 10,000 or more must provide an additional one or two recycling program elements from the above list, depending on the activities chosen. The DEQ can also approve alternative recycling programs that comply with administrative rules adopted by the Oregon Environmental Quality Commission.

Benefits of Recycling

The DEQ uses the results of the annual Material Recovery Survey to estimate the energy savings resulting from recycling, as well as reductions in greenhouse gases associated with recycling, composting, and energy recovery.

Energy - When recycled materials replace virgin feedstock in manufacturing, energy savings can be significant. For example, making aluminum from old beverage containers uses 93 percent less energy than making aluminum from bauxite. Newsprint made from old newspapers requires 46 percent less energy to make than newsprint made from wood.

The DEQ estimates that recycling by Oregon households and businesses in 2009 (counting only wastes generated in Oregon, not those generated elsewhere and shipped to Oregon for recycling) led to energy savings of roughly 27 trillion British thermal units (**BTUs**). To put this number in context and demonstrate the significance of energy savings from recycling, this is roughly 2.4 percent of total energy used in 2009 by all sectors of the economy in Oregon or the equivalent of 216 million gallons of gasoline.

Greenhouse gases - Net greenhouse gas reductions associated with materials recycled, composted, and burned for energy in 2009 are estimated at 2.8 million metric tons of carbon dioxide equivalent. This includes only materials that are counted toward the state's recovery rate and excludes any materials that are generated in other states but shipped to Oregon for recycling. To put this number in context, 2.8 million metric tons of carbon dioxide is equivalent to

tailpipe emissions from 570,000 "average" passenger cars, or roughly 3.9 percent of all 2009 greenhouse gas emissions statewide.

Waste prevention benefits - Waste prevention and reuse (as well as recycling) can significantly reduce environmental impacts associated with raw materials extraction, materials manufacturing, and transportation. In many cases, these environmental benefits "upstream" of the consumer may be significantly larger than the "downstream" benefits of waste reduction. Reducing the overall generation of solid waste is not just about saving landfill space. The value of achieving the new statutory waste generation goals was affirmed in 2004 by the Governor's Advisory Group on Global Warming. In its "Oregon Strategy for Greenhouse Gas Reductions," the advisory group identified achieving the waste generation (and recovery) goals as a top priority recommendation. Achieving the statutory waste generation goals contributes more than 15 percent of the total greenhouse gas reductions projected to result from the advisory group's entire package of recommendations.

Oregon Legislation

Oregon has been a national leader in recycling programs, and has one of the highest recovery rates for solid waste in the United States. Recycling is encouraged through state legislation including the Bottle Bill (1971), which established the first bottle deposit in the country, the Opportunity to Recycle Act (1983) that provides for curbside recycling and drop-off depots, and the Oregon Recycling Act (1991), which set goals for recovery of solid waste.

The Bottle Bill – In 1971, Oregon enacted the "bottle bill," a precursor to more recent product stewardship legislation. The Oregon Bottle Bill has been called the most effective recycling program in American history and is the nation's longest-standing deposit law. Within two years of its implementation, more than 90 percent of all carbonated beverage containers were being recycled and more than 80 percent of the roadside container litter disappeared. Container

recovery continues to be much higher in Oregon than in states that do not have bottle deposit laws but an increasing percentage of beverage containers are not covered by the law. In 2005, the estimated return rate for bottle bill containers dropped to 80 percent while the estimated return rate for all non-deposit beverage containers was 36 percent. In response, the 2007 Legislative Assembly enacted Senate Bill 707, the first significant expansion of the original bottle bill, applying the five-cent container deposit to water and flavored water beverages. Senate Bill 707 also created the “Bottle Bill Task Force” to study and make recommendations on the collection/refund of beverage containers, including issues like the use of redemption centers, appropriate beverages to recycle, and refund amounts. In 2011, the Legislative Assembly passed House Bill 3145 which expanded the beverage containers subject to the deposit, set a trigger for the deposit to increase to 10 cents if the recycling rate falls below 80 percent for two consecutive years but not before 2017, and set up a redemption center pilot project.

The bottle bill covers beer, malt beverages, carbonated mineral waters, carbonated soft drinks, water and flavored water but does not cover juice, teas, wine, liquor, dairy or other non-carbonated beverages. As a result of House Bill 3145 (2011), the bottle bill will cover all beverage containers between four ounces and 1.5 liters except wine, liquor and milk and infant formula by 2018. Manufacturers, importers, or distributors who sell eligible beverages must label the bottle with the 5-cent refund value and pay stores the refund value for each covered container returned to the distributor for recycling. Stores serve as collection centers and pay the 5-cent refund for each covered empty container returned. The distributor is responsible for collecting the containers from stores and retains the income from the sale of the recycled material. Unlike many other states, Oregon does not require that a handling fee be paid to stores or redemption centers to cover the operation costs and the unclaimed deposits are retained by the distributor. The DEQ estimates that 250 million

containers with deposits worth more than \$12 million are discarded, while another 60 million containers are recycled without being redeemed. In 2010, the Oregon Beverage Recycling Cooperative opened the first redemption center in Oregon allowing customers to drop off containers for counting by employees and have refunds deposited into an account.

Opportunity to Recycle Act of 1983 – This was the first state law in the United States to require that people statewide be provided with an opportunity to recycle. This opportunity included provision of curbside recycling collection to garbage service customers in cities with a population of 4,000 or more, recycling at all disposal sites or more convenient locations, and education and promotion programs designed to make sure that everyone is aware of their recycling opportunities and the reasons to recycle. The law also established the statewide hierarchy for managing solid waste, with reduced generation of waste being at the top of the hierarchy, followed by reuse, recycling, composting, and energy recovery, with land filling being the least-preferred method.

Oregon Recycling Act – In 1991, the Legislature enacted Senate Bill 66, which strengthened and broadened recycling requirements. The Act set a statewide recovery goal of 50 percent by 2000 and interim recovery goals for individual wastesheds by 1995. “Wastesheds” are generally the same geographic areas as counties, except Metro, which comprises Clackamas, Multnomah, and Washington counties, and Milton-Freewater, which is its own wasteshed. By 2000, Oregon had not met its ambitious recovery goal of 50 percent, although most wastesheds were meeting their individual goals.

The Act also established a household hazardous waste program; required recycled content in glass containers, directories, and newsprint publications; set standards for recycling, reuse, or recycled content of rigid plastic containers; required DEQ to calculate annual recovery rates; required DEQ to develop a solid waste management plan; and funded programs through

tipping fees at landfills. The Act banned disposal in solid waste facilities discarded or abandoned vehicles, large home or industrial appliances, used oil, un-chipped tires, and lead-acid batteries.

Wasteshed Incentives – During the 1997 legislative session a coalition of recycling and solid waste management interests came together to modify Oregon’s resource recovery efforts by giving local governments’ recovery rate credits for programs higher up the solid waste management hierarchy. The resulting legislation, House Bill 3456, enacted a two percent credit for wastesheds that establish and maintain programs in waste prevention, reuse, and backyard composting. The DEQ established guidelines and evaluation criteria for wastesheds that allowed them to earn up to six percent total credits toward their recovery goals for qualifying programs.

House Bill 3744 New Goals – Oregon was not successful in reaching the recovery goal of 50 percent by the year 2000 established by the Oregon Recycling Act. The DEQ reported to the 2001 Legislative Assembly that the original wasteshed goals, in total, would not produce a statewide recovery goal of 50 percent. The 2001 Legislature responded by unanimously enacting House Bill 3744, which set Oregon’s first statewide waste generation goals and added waste prevention goal language to ORS 459.015. The measure set a statewide recovery goal of 45 percent for 2005 and 50 percent for 2009. In order to help meet the statewide recovery goals, all wastesheds set new voluntary recovery goals for 2005 and 2009 and submitted plans to the DEQ for how they planned to meet their new goals. If a wasteshed did not achieve its 2005 or 2009 waste recovery goal, the measure required the wasteshed to conduct a technical review of existing policies or programs and determine revisions to be implemented to meet the recovery goal. Wasteshed plans were to be updated by Dec. 31, 2006 and Dec. 31, 2010.

To recognize additional waste reduction efforts that cannot be measured, House Bill 3744

allowed a wasteshed other ways to qualify for a two percent credit toward its recovery rate. It allows wastesheds to apply for more than two percent credit for residential composting programs if they can document that more than two percent of the waste generated is being diverted by the programs. Finally, the measure gave wastesheds that burn mixed solid waste for energy recovery some additional credit toward their recovery rates under certain conditions.

Product Stewardship

Product stewardship is an environmental management strategy in which all parties involved in the design, production, sale and use of a product take responsibility for minimizing the product’s environmental impact throughout all stages of the product’s life. The greatest responsibility lies with whoever has the most ability to affect the lifecycle environmental impacts of the product. Recent legislation in Oregon has focused on individual products; however, some states have moved away from a single-product approach toward a framework product stewardship approach. The framework approach establishes consistent principles, clearly defined roles for all parties, predictability and a process for adding new products. Manufacturers are responsible for implementing and paying for an environmentally sound system to collect and manage their products, shifting waste management costs from government and the ratepayer to the manufacturer.

Oregon E-Cycles – In 2007, the Legislature passed House Bill 2626 requiring manufacturers of televisions, computers, and monitors (covered electronic devices or **CEDs**) to finance the collection and recycling of these products beginning on January 1, 2009. Under the bill, CED manufacturers must either manage their own statewide collection/recycling program or pay into in a state contractor program. Under either program, any Oregon household, certain small businesses and non-profits, and those individuals recycling seven or fewer CEDs are exempt from paying fees. Retailers are prohibited from selling CEDs unless the products carry a brand indicating compliance with the new law as of January 1, 2009. Effective January 1, 2010, the disposal of

computers, monitors and TVs was prohibited in solid waste facilities in Oregon. In 2010, Oregonians recycled 24.15 million pounds of old TVs, computers and monitors through the program

House Bill 3606 (2010) specified that the total recycling weight assigned to all television manufacturers in Oregon E-Cycles program be allocated based on respective market share. Senate Bill 82 (2011) expanded the covered devices to include printers and other peripherals and established a system of recycling credits. The credits are granted to programs that exceed their return share and can be sold to others or held to meet the program's recycling share in future years.

Paint Product Stewardship – House Bill 3037 enacted by the 2009 Legislature created a paint stewardship pilot program to reduce the disposal of post-consumer paint in landfills by promoting its reuse and developing a process of collecting, transporting and processing it in an environmentally sound fashion. The law requires the creation of a stewardship organization made up of paint manufacturers to implement the program by developing a plan and funding its implementation, including the development of educational materials for consumers. In addition, manufacturers pay an assessment which is incorporated into the price for each container of paint sold in Oregon, to collect enough funds to recover, but not exceed, the cost of running the paint stewardship pilot. Consumers can take unwanted paint to locations throughout the state for appropriate recovery and disposal free of charge. The DEQ reviews and approves program plans and provides compliance oversight. The pilot program sunsets June 30, 2014, but prior to that date DEQ must submit a report to the Legislature recommending whether or not to make the program permanent.

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